



CLINICAL **NEURO** SCIENCES

CALGARY  CANADA

2012 – 13 Annual Report

www.dcnsc.ca

01

To provide excellent clinical care in Neurology, Neurosurgery and Psychiatry to patients in our referral area.

02

To develop clinical-academic programmes in the Clinical Neurosciences of national and international stature. These programmes will provide special assessment and treatment, develop and test new forms of treatment and explore disease mechanisms.

03

To provide excellent educational programmes in the Clinical Neurosciences and related basic neurosciences including undergraduate, courses, clerkship, residency training, postgraduate training and continuing medical education.

04

To promote and conduct clinical research and clinically relevant basic science research into diseases of the nervous system.

DEPARTMENT GOALS



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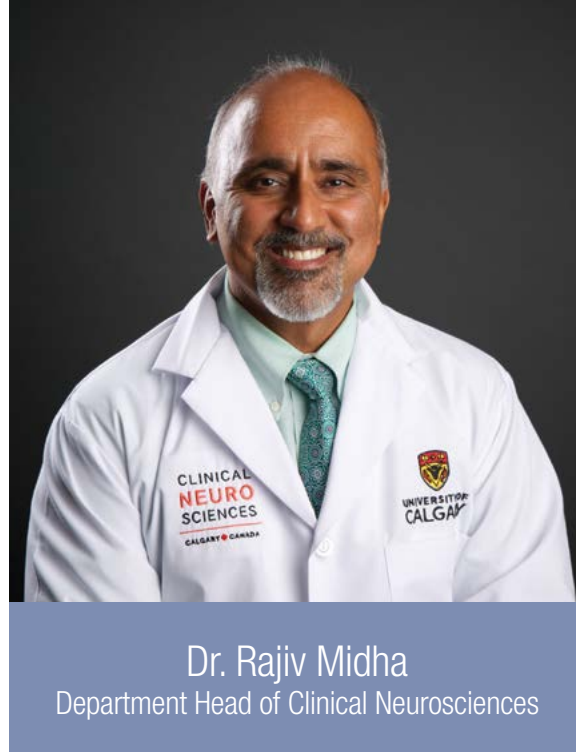
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A message from the Department Head

Dr. Rajiv Midha

“The past year has been an exciting year of transition for the department and we have again led the way in innovation and discovery in the clinical neurosciences.”



Dr. Rajiv Midha
Department Head of Clinical Neurosciences

In addition to the change in department head leadership this year, a search will be conducted this fall to appoint new leaders in the divisions of neurology and neurosurgery. During this important time of transformation, the department will continue to foster an environment which promotes excellence in all aspects of clinical care, research and education. Again this year, our members were recognized locally, nationally and internationally for their academic contributions and leadership. Our department continues to attract sizable funding dollars by publishing papers in high quality academic journals; our publications and grants are listed at the back of this report.

I am especially proud of the varied and key contributions our members make in the areas of new research, discovery and knowledge creation. This year, we congratulated Drs. Korngut, Pringsheim and Jetté for their recent work leading the Neurological Registry Best Practice Guidelines in Canada. These guidelines were published as a special supplement issue in the Canadian Journal of Neurological Sciences. The Canadian Registry Network connects researchers nation-wide in order to improve the quality, design and impact of registries.

In the Division of Physical Medicine and Rehabilitation, Dr. Chester Ho and Dr. Arun Gupta along with post-doctoral fellow, Terry Clark have

partnered with Alberta Ballet to develop a new pre-season screening program for Alberta Ballet dancers in order to address their performance injuries and overall health (see story page 52). This year, neurosurgeon Dr. Garnette Sutherland was recognized by NASA for his work on the neuroArm and its medical robotic applications (see story page 34).

The following are just a sample of our department's individual accomplishments over the last year: Dr. Minh Dang Nguyen and Dr. Shelagh Coutts were both recognized as part of Avenue Magazine's Top 40 Under 40 Class of 2012; Dr. Michael Hill was selected to be a member of the prestigious Canadian Academy of Health Sciences; Dr. Jodie Burton was named distinguished reviewer of the year by The Canadian Journal of Neurological Sciences; The Professional Association of Resident Physicians of Alberta recognized Dr. William Fletcher for an honourable mention as part of their clinical teaching awards, and Dr. Eric Smith was selected as the inaugural holder of the Katthy Taylor Chair in Vascular Dementia Research at the University of Calgary.

The department's local clinical activities are centred at the Foothills Medical Centre and the South Health Campus (SHC), with significant activities also at the Alberta Children's Hospital, the Peter Lougheed Centre and the Rockyview General Hospital. Outpatient and inpatient services, interventions and

procedures continue to grow at all of these sites. In addition, our well recognized speciality programs provide sub-specialized neurological and neurosurgical care to children and adults from Saskatchewan and British Columbia. This year we saw the consolidation of both inpatient and outpatient neurological services at SHC led by site director, Dr. Chris White. Fourteen neurologists are now primarily based at the SHC and many members of the department, in addition to these neurologists, see patients within the general neurology program and various sub-specialized clinics and programs. Neurology has been at the forefront of the implementation of the inpatient service including the new seizure monitoring unit at SHC which is now operational. Our neurology services have seamlessly transitioned to SHC this year thanks to strong site leadership and excellent administrative support.

We have outstanding residency training programs in neurology, neurosurgery and physical medicine and rehabilitation. A new group of resident trainees have started while our outgoing graduates have continued to excel by passing the Canadian Fellow of Royal College exams with a 100 per cent success rate. Our sub-speciality programs attract a large number of national and international fellows. These programs are described in more detail throughout this annual report. Two of our residents this year, Dr. Michael Tso and Dr. Daniel Yavin both received the prestigious Vanier Canada Graduate Scholarships (see story page 77). We are proud of our graduating residency and fellowship trainees who carry the Calgary brand with them as they move on to other Canadian and international institutions.

The life-blood of any department is its membership. We have exceptionally talented and dedicated faculty and trainees and our membership is growing. We were delighted to welcome three new faculty recruits, all within the PM&R division, to our department over the past year. Dr. Chantel Debert was a graduate of our PM&R residency training program. She has a Master of Cardiovascular and Respiratory Sciences degree with a special clinical and research interest in traumatic brain injury. Dr. Vithya Gnanakumar, a pediatric physiatrist, graduated from the PM&R residency training program at the University of Western Ontario; she is based at The Alberta Children's Hospital. Dr. Gillian Simonett graduated from the

PM&R residency training program at the University of British Columbia where she also obtained a Master of Health Sciences degree. Prior to joining our spinal cord injury rehabilitation program at The Foothills Medical Centre, she was on staff at the GF Strong Rehabilitation Centre in Vancouver.

The department has also continued to benefit from exceptional leadership. We saw Dr. Cairncross step down as department head last year and look forward to his renewed focus on the Neuro-oncology Program at the Southern Alberta Cancer Research Institute as the incoming director. After eight years, Dr. Samuel Wiebe stepped down as the division head for neurology to start a position as associate dean of clinical research in the Faculty of Medicine (see story page 14). Dr. Chester Ho continues to do an impressive job as a dedicated leader in the growing division of PM&R. The department wishes to thank Dr. Bin Hu for his creative leadership in the Division of Experimental Neurosciences for the past 10 years. Dr. Hu will be replaced by Dr. V. Wee Yong who will lead the newly renamed division of Translational Neurosciences division for the next decade (see story page 72). Further integration of our clinical and basic science members will ensure we continue to translate our clinical research into innovative medical discoveries which will change the way we practice and deliver health care in the future.

While this has been a year of transition, it has also been a year of growth and achievement for our department. New discoveries and innovations place our department at the forefront of contributing to knowledge creation in the neurosciences. Enjoy reading our annual report and please visit our website at www.dcnsc.ca to gain an appreciation of some of these notable activities and advancements. As we look forward, we will continue to fulfil our mission of fostering excellent clinical care through research and education while striving to improve the health outcomes of those with brain disorders.

Sincerely,

Rajiv Midha

Dr. Rajiv Midha
Head, The Department of Clinical Neurosciences



The Division of Neurology

Dr. Werner Becker, Interim Head, Neurology



Overview

The Division of Neurology includes 51 neurologists. Our vision is to improve the quality of life and productivity in our society by reducing the burden of disability caused by neurological disorders. Our mission is to be an international leader in neurological patient care, education and research. To meet its mission, the division's programs focus on the major neurology subspecialty areas. This facilitates excellent experiences for neurology fellows interested in further training in a specific area. Most of the neurologists are based at one of four hospital sites: Foothills Medical Centre, Peter Lougheed Centre, Rockyview General Hospital, and The South Health Campus (SHC). The Division operates as a cohesive unit with a city-wide on-call schedule organized by Dr. William Fletcher. All four hospital sites have inpatient neurology consultation services. Two sites, the Foothills Medical Centre and the South Health Campus, have neurology inpatient ward services.

Highlights

- In early September, the Division of Neurology entered a new era as it began to deliver clinical outpatient services at the SHC under the leadership of Dr. Chris White. In February, a new inpatient neurology unit, which now includes an epilepsy monitoring unit, also opened at the SHC.
- The division would like to formally thank Dr. Sam Wiebe who stepped down as Division Director in April. He led the division very successfully over the last eight years. Dr. Werner Becker is his replacement until a new leader is chosen.
- The division welcomed four new neurologists during the last academic year including: Drs. Katie Wiltshire, Suresh Subramaniam, and Sam Chhibber. Dr. Justyna Sarna also started a full-time locum position in our Movement Disorders Program. Three of our neurologists were transferred from clinical positions into geographic full-time positions including: Drs. Tamara Pringsheim, Bijoy Menon, and Fiona Costello.

Education

The Division of Neurology continues to offer excellent and diverse educational programs. It plays a large role in undergraduate medical teaching in the neurosciences course. The division had 19 neurology resident trainees during the year and 23 fellows. These fellows were distributed among the division's subspecialty programs including: stroke, multiple sclerosis, epilepsy, movement disorders, neuromuscular and headache. Dr. Michael Yeung was recently appointed as our neurology residency training program.

- Dr. Ahmad Abuzinadah, took the Royal College Examinations this year and successfully obtained his neurology fellowship.
- Dr. Lara Cooke was awarded the Joseph Mikhael Award for Contribution to Medical Education in Canada from the Canadian Association of Interns and Residents.
- Dr. Nathalie Jette was awarded The University of Calgary Graduate Students' Association Supervisory Excellence Award.
- Dr. Farnaz Amoozegar was awarded the Community Health Sciences Prize for academic excellence in April this year for work in her master's program in clinical epidemiology.

Research

- Dr. Eric Smith was named the first chair holder of the Katthy Taylor Chair for Vascular Dementia at The University of Calgary. Fiona Costello was appointed as the Roy and Joan Allen Investigator in Sight Research. Jodi Burton won the Alberta endMS - MS Society of Canada graduate student stipend to further her work in the area of MS and reproductive hormones. Bijoy Menon received the 2012 Heart and Stroke Research Scholarship award.
- The Stroke Program, led by Dr. Andrew Demchuk is leading and coordinating a multi-center international clinical trial, entitled the ESCAPE trial which is evaluating endovascular treatment in acute ischemic stroke.

- Division members played leading roles in the development and publication of number of important guidelines. These included *The Neurology Registry Best Practice Guidelines* developed by Drs. Lawrence Korngut, Nathalie Jette, Tamara Pringsheim and Paula deRobles. *Spontaneous intracranial hypotension: recommendations for management* was developed by Drs. Farnaz Amoozegar and Werner Becker. Drs. Werner Becker and Jephtha Davenport also developed The Primary Care Management of Headache in Adults on the Towards Optimized Practice (TOP) website. For more information go to: www.topalbertadoctors.org/cpgs.

Clinical Care

The division developed a new General Neurology Program led by Dr. Kevin Busche including a centralized access and triage component. This allows better monitoring of referrals to general neurology and is fully integrated with our urgent neurology clinic led by Dr. Alexandra Hanson. These new developments have increased the division's ability to meet the clinical need of our referral area. The urgent neurology clinic has recently been analyzed by one of our residents, Dr. Daryl Wile along with division members Dr. Sarah Furtado and Dr. Alexandra Hanson. We expect the results to be published shortly.



Dr. Ahmad Abuzinadah accepting the Resident teacher award as part of the 2012-13 Residency Awards this year. Dr. Abuzinadah also completed the Royal College examinations and obtained his neurology fellowship this year.



Strives

The Epilepsy Imaging Research Program Strives to Improve Patient Care

Epilepsy is one of the most common neurological conditions and up to 300,000 Canadians are affected by it. New epilepsy imaging research, conducted by Dr. Federico, associate professor of neurology, and his team at the Seaman Family MR Research Centre, is making it easier for patients to be assessed for epilepsy conditions, surgery and treatment.

Thirty per cent of epilepsy patients often experience seizures which can be difficult to control through conventional therapies. Indicated as sudden attacks, spasms, or convulsions, seizures are disturbances in brain function resulting from abnormal electrical brain activity. Dr. Federico along with co-investigators: Dr. Richard Frayne and Dr. Bradley Goodyear are using combined electroencephalogram and functional magnetic resonance imaging (EEG-fMRI) approaches to better understand how they are generated and whether it is possible to predict the occurrences of seizures.

“Through our epilepsy studies, we have shown that patients with temporal lobe epilepsy have different language networks in their brain, which may explain the language difficulties they experience,” says Dr. Federico. “We have found that epilepsy affects the brain organization itself.”

The two new magnetic resonance (MR) imaging tools that are being used by Dr. Federico’s lab are functional MRI (fMRI) and T2 relaxometry. Functional MRI is a form of imaging that registers blood flow changes related to brain activity during motor, language and sensory tasks. “With this new technology, we can perform specific language fMRI studies that will show if there is greater brain activation on the right or left side of the brain, allowing us to determine which side is dominant. We can then use this information for surgical planning,” he says.

Dr. Federico says right or left brain dominance is usually determined by conventional neuropsychological testing; however this method can often result in inconclusive answers whereas fMRI language studies provide a more definitive answer.

Functional MRI (fMRI) is also useful for mapping critical brain function near intended surgical targets. For example, fMRI is especially useful in determining if there is important motor and sensory function close to the location of a brain tumor. This information can be used to help the neurosurgeon plan the location and extent of the resection needed to safely remove the tumor.

The T2 relaxometry technique employed in Dr. Federico’s lab is used mainly by the epilepsy program for clinical purposes. T2 is a tissue property that is measured by MR imaging. Abnormal brain areas are typically identified by an excessively bright signal visually indicated on the MR images. In T2 relaxometry, a numeric value is assigned to the T2 signal in every region of the brain and these numbers are then compared to those from a normal brain scan. This process is much more objective, sensitive, and precise

than looking for bright areas on MR images with just the naked eye alone.

“This technology is now allowing the epilepsy team to draw conclusions on the locations of the seizures faster. If we suspect that a patient may have seizures coming from a certain area of the brain, T2 relaxometry is helping us to find this location earlier than we did before,” says Dr. Federico.

Dr. Federico says both fMRI and T2 relaxometry are now regularly used to assess epilepsy patients. He says this is a great example of bench to bedside translational research where epilepsy patients are positively impacted by the research being conducted. Currently, the team has studies underway to assess how this new MR technology has impacted overall patient care and the efficiency of clinical practice.

on the rise

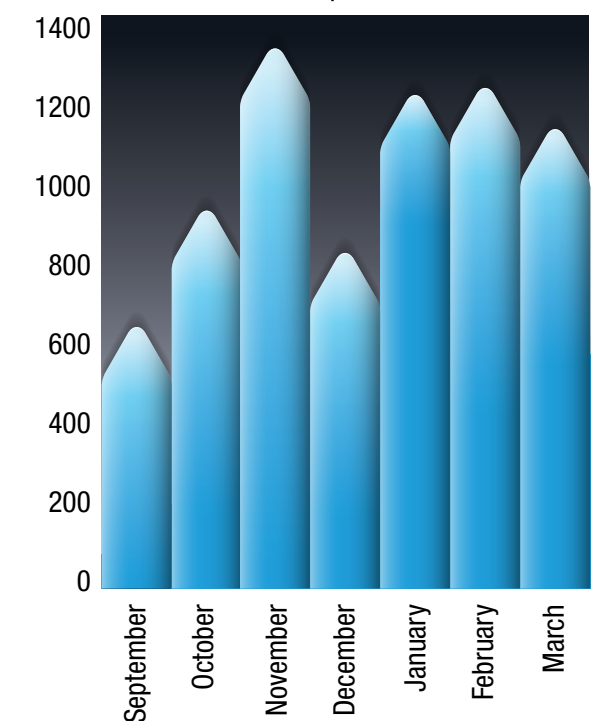
Collaborative efforts and patient numbers on the rise at the South Health Campus

Continuing growth and a focus on team efforts have kept the clinical neurosciences group very busy over the last year at the South Health Campus (SHC).

The out-patient neurology clinics started in September 2012 and in-patient neurology service started in February of 2013. Patient numbers have been steadily increasing over the last year. From September 2012 to March 2013, the neurology clinics checked in a total of 7,566 patients. In June this year, two seizure monitoring beds were added.

The campus growth, according to Dr. Chris White, associate professor of neurology at The Department of Clinical Neurosciences and site chief of neurology at The South Health Campus, is managed very

Neurology
Total Out-Patient Visits
South Health Campus 2012-2013



well because of the collaborative efforts of both the staff and management. “It has worked out much better than we had ever hoped,” says Dr. White. “We’ve got a great group of physicians here with a good mixture of skills.”

The rapid increase in the number of patients has also highlighted one of the challenges faced by the neurology team at the SHC. “We are already over capacity at a number of our clinics and having the necessary space to accommodate everyone is already an issue,” says Dr. White. “All of the clinics are as busy as they can be.”

The four organizational pillars at the SHC include: collaboration, innovation, patient and family-centered care and wellness. Patient and family centered care includes: the patients’ families, friends, family doctors, other health care providers as well as services in the community. The campus also features the latest in equipment and a high-performance health and wellness centre.

Dr. White is most proud of the care delivery model at SHC. The allied health care approach at SHC is part of its strong focus on collaboration. When referrals are necessary, the entire team of health-care professionals work together to create a one-stop shop experience for their patients. The allied health services include; occupational therapists, physiotherapists, social workers, psychologists, audiologists, nutritionists and spiritual care workers. This approach to health care makes a patient’s experience less confusing and stressful, and more positive overall.

“If someone comes to see us and they have other concerns that may be affecting their health—such as financial concerns—I can make one call and have the patient seen by someone who can help them usually that same day,” says White. “This approach also allows the allied health staff to develop expertise in neurological disorders.” To-date, this team-based approach has been well received says Dr. White. “We’ve had excellent feedback from the patients on this approach and we are very pleased with that.”



Dr. Chris White

New Online Tool

Epilepsy Research Leads to the Development of a New Online Tool for Physicians



Dr. Nathalie Jetté knew from the time she was three years old that she wanted to be a doctor. When her grandmother developed Alzheimer’s disease when she was a young girl, her next goal was to find a cure for it. Eventually, her research into Alzheimer’s disease led her to working in Dr. Margaret Fahnestock’s laboratory at McMaster University where she developed an interest in epilepsy.

Dr. Jetté shared this insight into her career as part of the Eyes High on Research lecture series at The University of Calgary in April. Jetté’s talk emphasized the importance for research to lead to direct application. She says the Goethe quote, “Knowing is not enough; we must apply. Willing is not enough; we must do,” serves as an inspiration to her.

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Dr. Jetté’s health services research focuses on; access to care and the appropriateness of care, quality of care, health care resources use, co-existing conditions, particularly mental health and how they apply to epilepsy outcomes. As an epilepsy specialist, Dr. Jetté spoke about the need for more epilepsy patients to be considered for surgery and the development of a national web-based tool to help family physicians to determine if their patient is a good candidate for surgery.

“About ten per cent of people will have a seizure sometime in their lifetime,” says Jetté. More than 200,000 Canadians are affected by epilepsy. It can take, on average, twenty years before an adult actually has surgery to prevent seizures.”

She says years of uncontrolled epilepsy can lead to; cognitive decline, poor quality of life, increased

mortality and high societal costs through loss of productivity and medical care expenditures. She says however, that numerous studies have shown that surgical management is superior to medical management, in appropriately selected patients, when it comes to preventing epilepsy.

“The majority of the studies have shown very positive outcomes for those who have the surgery. For example, we found patients with temporal lobe epilepsy had a 70 per cent success rate for freedom from seizures after surgery,” she says.

“One study in particular found that 74 per cent of patients who had surgery were seizure free after two years compared to zero per cent of those who were medically managing their seizures.”



Studies showed improvement in social outcomes after surgery as well. For instance, patients found that they were able to work and drive after surgery whereas they were not able to take part in these activities prior to surgery. “Most studies also showed improvement in mental health or no changes to mental health,” she says.

According to Jetté, there are various reasons patients are not being properly referred for epilepsy surgery. “There is a misconception that epilepsy surgery is a very risky procedure.”

Family doctors are not referring patients as they should be, or the patient may have had a previous negative experience with surgery. Parents may also consider the age of their child before proceeding with epilepsy surgery.



New Program at South Health Campus Offers Help for Dizziness

Relief may be closer at hand to help patients regain their balance and stop the whirling sensations caused by dizziness. The Neurovestibular Program opened at the South Health Campus (SHC) in January this year. Informally known as the Dizzy Clinic, the program was developed by Alberta Health Services and the neurology and otolaryngology divisions of DCNS and surgery.

Featuring the latest in diagnostic and rehabilitative technology, the program involves; three specialized physicians, a technician and two physiotherapists. “When patients can see an interdisciplinary team, it helps get them back on their feet faster,” says Dr. Fletcher, a professor of neurology at DCNS and a neuro-ophthalmologist who co-directs the program along with Dr. Beth Lange, an otolaryngologist (ear, nose and throat) specialist. “Research suggests that the longer you take to treat people with neurovestibular issues, the longer their recovery takes.”

Since January, close to 356 patients visit the program every week. The program only accepts those patients with a referral. The Neurovestibular program includes an Urgent Vertigo Clinic for those with acute vertigo symptoms. “Emergency departments now refer patients with acute vertigo symptoms directly to the urgent vertigo clinic,” says Suresh Subramaniam, clinical assistant professor of neurology, who runs the clinic. “This approach helps them recover more quickly.” Patients in the program also have access to testing with an audiologist elsewhere in the hospital.

The neurovestibular system is a complex network that includes inner ear structures, nerves, the brain and the eyes which all work together to help keep us oriented correctly in space. Problems with the



neurovestibular system can be caused by infections, head injuries, some medications, aging, migraines and stroke.

Some estimates say dizziness is the second most common complaint seen by general practitioners after back pain. About five per cent of the population will suffer from vertigo over the course of a year. Specialists are often able to diagnose where a problem is occurring by carefully observing eye movements while the patient is moved into different positions.

The program uses the following testing equipment to assess patients:

- A videonystagmography (VNG) which records eye movement using goggle-mounted video cameras.
- Caloric testing which irrigates each ear with warm or cool water and then tracks the patient's eye movements with the VNG system.
- Rotational testing, which involves sitting in a chair that rotates in darkness while eye movements are recorded with the VNG system.
- Computerized posturography which measures balance while standing on a platform surrounded by visual input.



Rotating chair





Reflection

Dr. Sam Wiebe reflects on his time as Division Head of Neurology

It is with mixed emotions Dr. Sam Wiebe leaves his eight-year post as division head of neurology. In May, 2013, Dr. Wiebe stepped down and will be focusing his future efforts in the Dean's office at The University of Calgary.

"The Department of Clinical Neurosciences has been a family to me. It's a little sad but on the other hand, I'm excited about new opportunities for myself and for the division here as well. A new direction and a new vision are always good things for the department," he says.

Dr. Wiebe is also a professor for Community Health Sciences, and Pediatrics for the Faculty of Medicine at the University of Calgary. In addition, he is an associate dean for clinical research and director of the unit for clinical analytics and research support in the Faculty of Medicine.

He has seen many changes in his time at DCNS. "The Division of Neurology has changed enormously since 2004. It's larger in terms of the depths of its programs, its expertise and its geographic footprint."

He says the growth of the division of neurology also brings with it new challenges and complexities. "We need to look at these new challenges carefully while still delivering the best possible care to our patients." For example, he says it is becoming a challenge to cover the growing number of clinic locations and in-patient units for DCNS. "Staying cohesive is definitely going to be a future challenge for the department."

Dr. Wiebe was very pleased with the smooth implementation of the inpatient and outpatient neurology services at the South Health Campus last year. He says, "We were able to move into the South Health Campus in an almost seamless manner. The leadership of Chris White and many others made that important transition possible."

“We have one of the strongest neurosciences groups in the country here. The level of energy, enthusiasm, initiatives and accomplishments here are just excellent for a young department. The collegiality among the divisions is exemplary. I have gained so much from working with such bright, keen individuals.”

Dr. Sam Wiebe

While the future challenges with departmental growth exist, Dr. Wiebe believes there are many advantages to being part of the future of DCNS.

"We have one of the strongest neurosciences groups in the country here. The level of energy, enthusiasm, initiatives and accomplishments here are just excellent for a young department. The collegiality among the divisions is exemplary. I have gained so much from working with such bright, keen individuals," he says.

When looking back at his many accomplishments in the division, he says all of his accomplishments involved the efforts of others. For example, he says Dr. Werner Becker was instrumental in working with him to establish the Academic Alternate Relationship Plan (AARP), a program that allows physicians to complete research and education while also attending to patients. "He burned the midnight oil in developing the program and as a result of this hard work, we are one of the few departments that have such a program." Dr. Werner Becker was named as the interim Division Head when Dr. Wiebe stepped down in May.

Dr. Wiebe is very proud of the recruitment and success of the 16 neurologists who joined the department in his time as division head. "This recruitment has demonstrated our commitment to expanding the department in strategic areas. We have people here who work in basic science, clinical trials, and health services and population research who are internationally acclaimed in their field," he says.

He says it has been very rewarding to witness the development of the division members as they grow within the department. "They arrive as junior members, increase in their expertise and eventually become established members who stand on their own and mentor others."

His division's focus on epilepsy research in recent years has also pleased him. "I truly believe that when people hear the word epilepsy now they think of Calgary and the research that is happening here. Our relationship with the pediatric team for epilepsy has also been very beneficial to our research as a whole."

In the future, Dr. Wiebe will be working to establish a clinical research unit at the Faculty of Medicine. It will support clinical researchers in the neurosciences and mental health. His goal he says, is for it to become a known centre for high quality clinical research.

Imparting some words of advice, he says "When you wed research excellence with clinical excellence you can guarantee improved patient care. I am so grateful I had the opportunity to lead this incredible group of people, for that, I thank the department and wish them much success in the future."



The Calgary Stroke Program (CSP)

Director: Dr. Andrew Demchuk

The Calgary Stroke Program DCNS and a joint venture between The University of Calgary and Alberta Health Services, continues to grow and contribute to the field of stroke care. Our program figured prominently nationally and internationally on a number of fronts.

Highlights

- Our research team has taken a major step forward in academic medicine by leading a large multicentre, multinational randomized clinical trial, entitled ESCAPE, which has enrolled 25 subjects to date with 15 sites across the world in at least four countries.
- The group continues to achieve a high level of academic productivity with 80 published citations in this academic year. This included one NEJM and two Lancet Neurology articles



based on three major studies; IMS-3, PREDICT, ENACT. Several members were co-authors and the Calgary Stroke Program figured prominently in leadership and co-leadership roles for those three studies.

- The clinical research component of the stroke program led by Dr. Michael Hill earned a CIHR-CMAJ 2012 Health Research Innovation Award.



- Dr. Eric Smith was awarded a HSFA grant to study Cerebral Blood Flow Regulation in Patients with Alzheimer's and Small Vessel Diseases and a 1.2 million grant from CIHR to study covert stroke in Canadians, using magnetic resonance imaging (MRI). Dr. Smith was also named the Katthy Taylor Chair in Vascular Dementia www.medicine.ucalgary.ca/vascular-dementia-research-chair-canada.
- Dr. Shelagh Coutts was named as one of Calgary's *Top 40 Under 40* and received a 4.7 million dollar Genomics Canada grant as co-Principal investigator with Dr. A. Penn from the University of Victoria.

avenue
740



- Dr. Bijoy Menon officially joined the department as an assistant professor. He also obtained a Heart and Stroke Foundation (HSF) Scholarship award and published 13 citations in major journals such as Annals of Neurology, JCBFM, and Radiology.
- Dr. Sean Dukelow, received a HSF operating grant and achieved the highest score in the competition. His stroke recovery work on robotics was highlighted on Shaw TV.

- In 2012, our clinical care program was once again awarded The Award of Distinction from Accreditation Canada for May 2012 to 2014. This is the second consecutive Award of Distinction for our program and we remain the only centre in Canada to receive this award two terms in a row. Our program also worked with the Canadian Stroke Network to create the *This is What Quality Stroke Care Looks Like*, an abridged version of the full report published in 2011.



ACCREDITATION CANADA
AGRÉMENT CANADA

Driving Quality Health Services
Force motrice de la qualité des services de santé

Education:

Education is the core of the CSP. As of June this year, our program has trained and graduated 51 stroke fellows, from 17 countries including Canada. Last year we trained eight fellows including four Canadians. In addition, we have seen a major increase in applications to our fellowship with 2 to 3 applicants per month.

This year, we introduced an educational booklet titled *Patient and Family Passport for Stroke* which was provided to hundreds of stroke patients.

We continue to evolve the National Acute Stroke Rounds led by Dr. T. Watson. These rounds are telecast monthly through Tele-health across Canada.

The 3rd Canadian Stroke Congress took place in Calgary in late September 2012.

Our globally recognized Stroke Fellowship Program had its first fellowship reunion in September 2012 with over 25 current and former fellows attending from around the world.

Research:

Significant progress has been made over the last year to further establish the CSP as an internationally respected clinical research program and imaging core lab facility for large stroke trials. We function as the CT core lab for six multicentre randomized trials.

Members

Stroke Neurology:

Drs. Phil Barber; Shelagh Coutts; Andrew Demchuk; Michael Hill; Keith Hoyte; Adam Kirton (Pediatrics); Gary Klein; Bijoy Menon; Alekys Mineyko (Pediatrics); Dawn Pearson; Eric Smith; Peter Stys; Suresh Subramaniam; Tim Watson

Stroke Physical Medicine and Rehabilitation:

Drs. Sean Dukelow; Ken Lam; Steve McNeil

Vascular Neurosurgery:

Drs. Alim Mitha; Garnette Sutherland; John Wong

Interventional Neuroradiology:

Drs. Muneer Easa; Mayank Goyal

Nursing:

Dr. Teri Green



The 2012 Stroke Fellow Reunion held in Calgary.



The Calgary Comprehensive Epilepsy Program

Director: Dr. Neelan Pillay



potential of each individual with epilepsy through an integrated care approach. The Calgary Epilepsy Program continually strives to be a centre for clinical and academic excellence through the improvement of consolidated clinical services, education and research. Enhancing local and national initiatives to improve care for our patients, the program provides:

- Sophisticated, state-of-the-art neurophysiologic assessment including: EEG, evoked potentials, 24-hour ambulatory EEG monitoring, functional brain mapping and intraoperative monitoring
- Inpatient video monitoring to evaluate potential epilepsy surgery patients
- Neuro-psychological assessment and psychological counseling
- Epilepsy surgery for medically resistant epilepsy
- Vagal nerve stimulation (VNS)
- Access to the latest clinical research trials in epilepsy including clinical drug trials and new surgical treatments

Overview

As one of the premiere epilepsy centres in Canada, the Epilepsy Program works collaboratively to find the most appropriate treatment for each patient. We develop innovative ways to diagnose and treat epilepsy in children and adults. The Calgary Epilepsy Program consists of a unique core of specialists. These include: pediatric and adult epileptologists, epilepsy surgeons, EEG technologists, neuroradiologists, neuropsychologists, clinical psychologists, basic scientists, physician clinical assistants, neurology residents, epilepsy fellows, and nurses who all work together to provide comprehensive care for epilepsy patients.

Patients and families often present with complex needs arising from the impact of this chronic illness. These needs along with the experience of change in their disease process and their response to treatment make it increasingly important to maximize the full

Highlights

- The theme for the 3rd Annual Epilepsy Symposium held in October 2012 was on biomarkers in epilepsy. Recent advances in electrophysiology, neuroimaging, molecular biology and genetics promise to reveal clinically useful biomarkers for epilepsy in the near future.



- Dr. Sam Wiebe organized the 30th International Epilepsy Congress and brought it for the first time ever to Montreal, Canada. He completed term as elected secretary general of the International League Against Epilepsy and was elected by 112 countries as member of the executive board of the International League Against Epilepsy. Dr. Wiebe also received the award ambassador for epilepsy in Latin America from the commission on Latin American Affairs of the International League Against Epilepsy. He launched a faculty-wide clinical research unit for analytics in support of all health research initiatives in the Faculty of Medicine.
- Dr. Nathalie Jetté was awarded the 2013 Graduate Students' Association Supervisory Excellence Award and a Division of Neurology Excellence in Research Award. She is the Canada Research Chair Tier 2 in Neurological Health Services Research and she was invited to speak at The University of Calgary Eyes High Public Lecture.
- Dr. Paolo Federico fully implemented the clinical fMRI program based on experience from fMRI research activities. The fMRI program provides timely service to the entire department. He received an operating grant from Epilepsy Canada to assess the clinical utility of a novel magnetic resonance (MR) imaging technique (voxel based relaxometry) in the management of patients with epilepsy.

Education

Dr. Nathalie Jetté directed the study course I for PhD students and supervised four PhD students. The graduate students have won awards and scholarships including: CIHR (doctoral, masters and one Vanier Scholarship), AIHS, National CLAE Mary Ann Lee Award, Achievers in Medical Science Awards, Western Regional Training Centre Studentships, Eyes High Research Excellence Doctoral Award, Eyes High Leadership Doctoral Scholarship and QE II Awards

Research

Dr. Sam Wiebe is involved in research to determine of minimal clinically important changes in quality of life after epilepsy surgery. The research includes an assessment of epilepsy severity, epilepsy disability and satisfaction with treatment.

Dr. Nathalie Jetté received a CIHR grant to test the usability and feasibility of an online tool developed to guide physicians in determining the appropriateness of their patients for an epilepsy surgery evaluation. She launched the recruitment for the NEurological disease and Depression Study (NEEDS) initiative, an interdisciplinary program aimed at addressing depression in those with neurological conditions. More than 750 patients have been recruited between August 2012 and June 2013. In addition, she also led several major team grants including large scope projects for the national population study of neurological conditions addressing the burden of 15 neurological conditions including epilepsy.

Dr. Paolo Federico leads the only laboratory in the world performing intracranial EEG-fMRI at 3T, which is providing unique insights into the generation of interictal discharges (see story page 8).

Members

Drs: S Wiebe, N. Pillay, W Murphy, Y Aghakhani, B. Klassen, A. Hanson, P. Federico, N. Jetté



The Headache Program

Director: Dr. Jephtha Davenport

Overview

The Headache Program is one component of the Calgary Pain Program. The program has two clinics within Calgary. Satellite clinics include a headache clinic for patients with post-traumatic headache within the Division of Psychiatry's Traumatic Brain Injury Clinic as well as general neurology clinics held in community health centres. Patients participate in a variety of clinical and educational encounters.

Highlights

The Headache Program follows a patient-centered, team approach with interdisciplinary collaboration. We completed some major physical changes in the past year. The CHAMP clinic relocated to its new location at South Health Campus (SHC) in September 2012. Following the July flood, the program moved from the Holy Cross Centre to the Richmond Road Diagnostic & Treatment Centre. In total, the program receives over 2,000 patient referrals per year and we provide access to a greater number of patients each year. The program offers: group education sessions, telephone consultations with referring physicians and patients and telehealth visits for patients living outside of Calgary. Many patients from Calgary and the surrounding communities work with the Headache Program as they search for strategies to improve their headache management.

Education

We provide training to: headache fellows from Canada and abroad, residents in anesthesiology and family practice and medical students across Canada. The Headache Program also emphasizes the role of patient and family education in coping with headache disorders, many of which are chronic diseases with episodic manifestations.

Research

The Headache Program is invested in clinical research which includes a Phase 2 medication trial, a non-pharmacological intervention trial, and a bridging prophylaxis trial. This research includes outcomes measurement, quality improvement, and the development of provincial and national headache guidelines.

Members

Physicians:

Headache fellows: Dr. Prin Chitsantikul, Dr. Thilinie Rajapakse;
Neuropsychiatrist: Dr. Aaron Mackie; Family Physician: Dr. Lori Montgomery; Anesthesiologist: Dr. Kelly Shinkaruk; Psychiatrist support services: Dr. Sam Oluwadairo, Dr. Stephen Amadala, Dr. Pamela Manning); Neurologists: Dr. Farnaz Amoozegar, Dr. Werner Becker, Dr. Lara Cooke, Dr. Jephtha Davenport, Dr. Arnolda Eloff; Dr. Keith Brownell (community clinics).

Nurses:

Clinical Coordinators: Irene O'Callaghan, Jennifer Kirker, Nora Lee; Nurses: Anquan Lião, Deborah Thorne; Nursing Attendants: Rhian Mochoruk, Paulette Warner;

Allied Health:

Occupational therapists: Kathryn Coutts, Allison McLean, Angie Yang; Physiotherapists: Kate Gerry, Philis Heffner; Psychologists: Dr. Penny Ford, Dr. Sharon Habermann, Dr. Krista Clelland; Pharmacist: Joyce Côté; Kinesiologist (François Gagnon) Dietician: (Kelly Sullivan)

Administration & Administrative Support:

Leatha Semwick, Lydia Gallo, Lisa Bannister, Kate Walker, Deb Nicholson, Krista Hansen, Kristen Haakenstad, Connie Burkart, Suzanne Basiuk, Geoff Schulz, Carolyn Baldwin

The Cognitive Neurosciences Program

Director: Dr. Eric Smith

Overview

The Cognitive Neurosciences Program provides expert medical consultation for cognitive disorders and educates undergraduate and postgraduate learners about the medical evaluation and treatment of dementia and milder forms of impaired cognition. The program conducts research on the causes and treatment of cognitive disorders. Program members include neurologists, psychiatrists, neuropsychology, research staff, and allied health professionals at the Foothills Medical Centre and South Health Campus (SHC) sites.

Highlights

In addition to the Foothills Medical Centre location, the cognitive neurosciences clinic expanded to the SHC in 2013. Dr. Aaron Mackie from the Department of Psychiatry, has also joined the clinic. Clinic physician Dr. Zahinoor Ismail was selected to the Program Committee of the Canadian Conference on Dementia. Dr. Eric Smith, clinic director, was named the inaugural holder of the endowed Kathy Taylor Research Chair in Vascular Dementia at the University of Calgary; in this capacity he will promote vascular dementia research at the university.

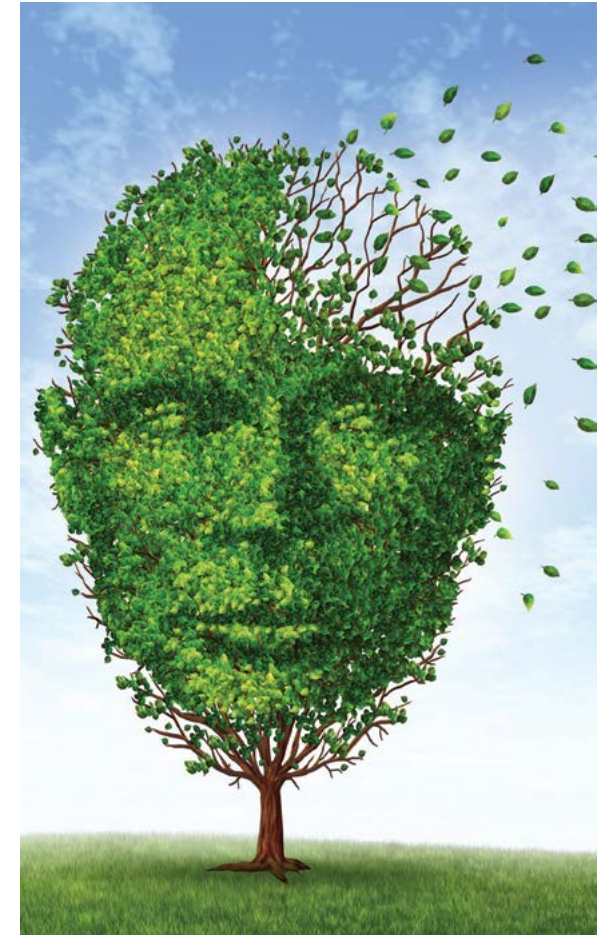
Education

The clinic serves as a site to train residents and medical students in the diagnosis and management of cognitive disorders. Residents in various disciplines, including neurology, psychiatry and geriatric medicine, have completed rotations in the clinic.

Research

The program is active in investigator-initiated research, multi-center studies and drug trials. The clinic is part of the C5R Canadian Dementia Research Trials Network. Ongoing studies include: the investigation of the diagnosis and prognosis of patients with mild cognitive impairment, vascular dementia, Alzheimer's disease, and cerebral amyloid angiopathy. For more information go to:

www.ucalgary.ca/esmithresearch.



Members

Neurology:

Dr. Eric Smith, Dr. David Patry, Dr. Dawn Pearson, Dr. Bijoy Menon, Dr. Philip Barber

Psychiatry:

Dr. Jeremy Quickfall, Dr. Zahinoor Ismail, Dr. Aaron Mackie

Neuropsychology:

Dr. Catherine Burton, Dr. Kim Goddard



The Movement Disorder Program

Director: Dr. Ranjit Ranawaya

Overview

Movement Disorders are diseases that result in involuntary movements such as tremor, dystonia, chorea, bradykinesia and tics. These disorders cause significant disability in one of every 100 Albertans and impact over 30,000 Alberta families. The program provides a multidisciplinary clinic with a staff of over 20 individuals including specialists in neurology, neurosurgery, psychiatry, nursing, social work, psychology and physiotherapy. The program treats over 2,000 patients with Parkinson's disease (PD), Huntington's disease, Tourette's syndrome, spinocerebellar ataxia, dystonia and tremor. Approximately 2,000 patients are followed with close to 10,000 patient visits per year.

There is a large research component in the program that focuses on improvements in treatment of Parkinson's disease and related disorders. Research to understand basic mechanisms of disease is coordinated through the Hotchkiss Brain Institute. This program is designated as a center of excellence for Parkinson's by The National Parkinson's Foundation in the United States.

Highlights

- Dr. Justyna Sarna has been doing locums for us to help reduce our waiting lists

Education

- We continue to provide education to medical students and residents from: neurology, neurosurgery, psychiatry, general internal medicine and family medicine.

Research

- Neuroprotection for PD
- Music therapy in PD
- Identification of genetic factors in PD

- Neuroprotection for Huntington's disease (HD) as well as two long term follow-up prospective observational trials for HD
- Novel treatments in PD, HD, dystonia, and spinocerebellar ataxia
- We continue to do clinical trials in Parkinson's disease, dystonia, Huntington's disease and Tourette's syndrome.



Members

Dr. Ranjit Ranawaya, Dr. Sarah Furtado, Dr. Scott Kraft, Dr. Tamara Pringsheim, Dr. Zelma Kiss, Dr. Bin Hu, Dr. Angela Haffenden, Dr. Stewart Longman, Dr. Jeremy Quickfall, Dr. Michael Trew, Dr. Justyna Sarna (locum)

Fellows:

Dr. David Salat-Foix

Nurses - Clinical:

Karen Hunka, Michelle Zulinick, Pia Lawrence, Nancy Labelle

Nurses - Research:

Lorelei Derwent, Carol Pantella

Secretarial Support:

Sheila Pinkney, Marlene Conrad, Bonita Woytowich, Sue Dalzell

The Multiple Sclerosis (MS) Program

Director: Dr. Luanne Metz

Overview

The Multiple Sclerosis (MS) program provides multidisciplinary, population-based care to people with MS and other Central Nervous System (CNS) demyelinating disorders living in southern Alberta and southeastern British Columbia. The services provided by our specialized clinical team, based on a chronic disease management approach include: medical, nursing, rehabilitation and counseling. Our goal is to prevent or lessen disability and optimize wellness. Our team also provides leadership in care delivery and regularly provides advice regarding policies related to MS care. Dr. Michael Yeung, Chair of the Alberta MS Drug Panel and Dr. Luanne Metz are both on the advisory committee of the Canadian MS Monitoring System which is a joint federally and provincially funded project led by the Canadian Institute of Health Information.

Highlights

The MS Clinic expanded from Foothills Medical Centre to a second site at South Health Campus in 2012. This brought additional resources to serve the growing MS population. It also improved the ability of many patients to access care. In addition, a neuro-immunology clinic (NIC) evolving from the MS Clinic, opened at South Health Campus in September 2012. Patients with non-demyelinating inflammatory CNS diseases such as CNS sarcoidosis, CNS vasculitis, and other autoimmune diseases can now be cared for in their own clinic. The NIC, led by an MS Program member Dr. Alikhani, will support the development of clinical expertise and research.

Education

The MS program supports the education of trainees at all levels. In 2012-13 we had two clinical fellows: Drs. Scott Jarvis and Helene Parpal. Both were funded by Canadian Network of MS Clinics Fellowships. An increasing number of residents are choosing to do MS Clinic rotations. Dr. Michael Yeung became the neurology residency education program director in 2013. Dr. Kevin Busche completed

several years as the course chair of the undergraduate neuroscience education program. Dr. Wee Yong leads the Alberta EndMS research and training network which enhances the experience and training of several graduate students and postdoctoral fellows www.endmsnetwork.ca.

Research

The MS program is well recognized for its research strengths. In association with the Hotchkiss Brain Institute, current active research includes: translational research, clinical and epidemiological research, basic science, innovations in imaging and trial design and clinical trials. In 2013, enrolment wrapped up to our multicentre, randomized controlled trial of minocycline in clinically isolated syndrome and a province-wide epidemiologic study of MS www.tamsi.ca. Both trials involve multiple team members. The MS trial is funded by the MS Society of Canada and TAMSII is funded by Alberta Health.

Members

Physicians:

Drs. Katayoun Alikhani, Nadeem Bhanji, Jodie Burton, Kevin Busche, Marcus Koch, Dan McGowan, Aaron Mackie, Jean Mah, Luanne Metz, William Murphy, Scott Patten, David Patry, Dawn Pearson, Michael Yeung.

Basic Scientists:

Lenora Brown, Shalina Ousman, V Wee Yong, Yunyan Zhang

Program leaders and managers:

Colleen Harris, Erin Gervais, Winona Wall, Graziela Cerchiaro, Charlotte Breakey, Claudia Silva



The Neuromuscular Program and ALS Clinic

Director: Dr. Douglas Zochodne

Overview

Established in 1992, The Neuromuscular Program meets the overall health needs of people with peripheral nerve, muscle and neuromuscular junction disorders. Additionally, this program provides state of the art diagnostic and treatment services as well as cutting edge research. The overall emphasis of this program is on excellence in patient care, collegiality and innovation. To date, the program consists of several sub-specialty clinics: the neuromuscular clinic, the ALS and motor neuron disorders clinic, neuropathic pain clinic and the peripheral nerve clinic based at The Foothills Medical Centre (FMC) and The South Health Campus (SHC). The vision of this program is to evolve into an internationally recognized program model for access and evidenced-based care for patients with nerve and muscle disorders.

Highlights

Dr. Chris White opened the SHC and outpatient facilities for DCNS and furthered plans to provide exceptional patient care in a patient centred, multidisciplinary environment. This included neuromuscular and EMG clinics. He served as the chief examiner for the Canadian Society of Clinical Neurosciences EMG section and as a Royal College of Physicians and Surgeons Examiner in Neurology.

Dr. Keith Brownell was elected for a three-year term to the Council of the College of Physicians and Surgeons of Alberta. He received a neurology AARP Award in category of colleague of the year and a 2013 AB Baker teacher recognition certificate from the American Academy of Neurology. He serves as an active member of Foothills Medical Centre Ethics Committee and has agreed to be part of the development of ethics protocols at the SHC.

Dr. Cory Toth is completing editorship for the book *Neuropathic Pain: Causes, Management and Understanding*, to be published through Cambridge. He has served as an associate editor for Pain Medicine and as the research director for the Chronic Pain Centre. He was awarded the Division of Neurology Award for Clinical Excellence, the Queen Elizabeth II Diamond Jubilee Medal, and the Professional Association of Residents of Alberta (PARA) Resident's Provincial Teaching Award in 2012.

Dr. Lawrence Korngut co-led the development of the Canadian Neuromuscular Diseases Registry Network, a national network of centers that register their patients to combine their expertise in neuromuscular disorders. He assumed the position of chair of the medical and scientific advisory Committee for Muscular Dystrophy Canada and he is the director of the ALS clinic.

Dr. Sameer Chhibber introduced an integrated muscle biopsy clinic at SHC designed to provide timely muscle biopsies working closely with neuropathology to improve and advance neuropathological diagnosis. He led the neuromuscular educational program that in the last academic year, trained one neuromuscular fellow and 16 residents, including visiting residents from Saskatchewan. Dr. Chhibber developed and hosted the highly successful Western Canadian Neuromuscular Medicine and Electrophysiology Update Conference in Banff last November. This was a continuing medical education accredited three-day conference with 80 attendees from across Canada.



Dr. Sameer Chhibber

Dr. Tom Feasby rejoined the neuromuscular clinic in 2013 after his completion of his deanship at Faculty of Medicine, The University of Calgary. He has ongoing interests in outcomes research and inflammatory neuropathy.

Dr. Douglas Zochodne served as director of the Adult Neuromuscular Program and Adult Clinical Neurophysiology Program of Alberta Health Services. Within the Hotchkiss Brain Institute (HBI), he directed the regeneration unit in neurobiology (RUN) facility and served on the HBI Strategic Research Innovation Council. He also served as past president of the peripheral nerve society and renewed funding of his research laboratory.

Edmonton. The new SHC electrophysiology exam rooms have been equipped with cameras to allow for recorded patient and trainee interactions thereby improving feedback to our trainees on patient care. Members of the neuromuscular group are actively involved in: undergraduate medical teaching, instruction of DCNS residents and other trainees, on call or in clinic trainee teaching and postdoctoral, graduate, undergraduate and summer student supervision.

Members

Dr. Douglas Zochodne, Dr. Chris White, Dr. Lawrence Korngut, Dr. Keith Brownell, Dr. Cory Toth, Dr. Sameer Chhibber and Dr. Tom Feasby.

Clinic Coordinators:

Dana Tigner, Shannon Searle, Maureen McRae,

Clinical Fellow:

Dr. Mohammed Alanazy



HOTCHKISS BRAIN INSTITUTE

Education

This year we have embraced the use of telehealth and introduced a number of neuromuscular rounds including: weekly case rounds, muscle and nerve pathology rounds, EMG waveform rounds, and monthly neuromuscular grand rounds, which are broadcast across sites and to our colleagues in



The Neuro-ophthalmology and Neurovestibular Programs

Director: Dr. William Fletcher



Overview

The Neuro-ophthalmology and Neurovestibular Programs within the DCNS and surgery, the University of Calgary and Alberta Health Services, are multidisciplinary programs encompassing clinical, laboratory and physiotherapy services. The neuro-ophthalmology clinic, located in the eye clinic at Rockyview General Hospital, focuses on the diagnosis and treatment of complex vision and eye movement problems resulting from diseases such as multiple sclerosis, brain tumours, stroke and neurodegeneration. The neurovestibular program, located at South Health Campus (SHC), integrates the clinical assessment, laboratory testing and rehabilitation of patients with vertigo and balance disorders. The goals of both programs are to provide state-of-the-art diagnosis and management for these conditions.

Highlights

The Neurovestibular Program was launched successfully at SHC in 2012, in co-operation with the Division of Otolaryngology co-directed by Dr. Beth Lange, Dr. Suresh Subramaniam; was recruited, expanding the number of clinics in both programs. The PITNET Program was inaugurated in cooperation with neurosurgery and other disciplines for the integrated management of patients with pituitary tumours. A proposal for a neuro-visual rehabilitation program was submitted to Alberta Health and Wellness.

Education

Resident education includes: regular rotations on neuro-ophthalmology clinics by neurology and ophthalmology residents, attendance at the neurovestibular clinic by neurology residents, and resident seminars and examinations. Dr. Elena Sokolova and Dr. Suresh Subramaniam are recent fellows within the program.

Research

Research is an important part of the Neuro-ophthalmology and Neurovestibular Programs. Funded investigations included: a NIH-sponsored study of idiopathic intracranial hypertension, studies of the possible roles of hormones, vitamin D and a novel drug in optic neuritis, the use of optical coherence tomography in multiple sclerosis and in Parkinson's disease and the use of a prototype rotary chair in the diagnosis of vestibular dysfunction.

Members

Medical Staff:

Dr. William Fletcher
Dr. Fiona Costello
Dr. Suresh Subramaniam
Dr. Beth Lange

Vestibular Physiotherapy:

Kimberly Weber
Veronique St. Georges

Vestibular Laboratory Support:

Craig Mulroney

Clerical Support:

Gina Quinn

The Tourette Syndrome and Pediatric Movement Disorders Program

Director: Dr. Tamara Pringsheim

Overview

The Tourette Syndrome and Pediatric Movement Disorders Clinic provides consultation and continuing care for children and adults with Tourette Syndrome and children with movement disorders such as dystonia, tremor, cerebral palsy, and complex motor stereotypies.

Highlights

We were most fortunate to have movement disorders specialist Dr. Justyna Sarna join the clinic in 2012. Following the successful publication of *The Canadian Guidelines for the Evidence Based Treatment of Tourette Syndrome* in 2012, led by Tamara Pringsheim, we received a private donation to create companion books based on the guidelines for children and adults with Tourette Syndrome. With the help of neurologist Dr. Jephtha Davenport, we created an illustrated story about a child with Tourette Syndrome titled *Robbie's Quick Adventure*, which will be launched at the Tourette Syndrome Foundation of Canada meeting in September of 2013. Our book for adults is underway, with our clinic nurse, Tracy Hammer and nursing student, Amina Wu contributing to its creation.

Education

We provide training to: residents in pediatrics, neurology and psychiatry, as well as fellows in movement disorders and medical students. Residents in pediatrics spend time in the clinic as a part of their core developmental pediatrics rotation. Residents from other disciplines also take part in the clinic on an elective basis.



From Left To Right: Registered nurse Tracy Hammer, Dr. Justyna Sarna and Dr. Tamara Pringsheim

Research

In addition to the knowledge translation activities described above, research at the clinic has been focused on improving antipsychotic safety monitoring in children and promoting rational and judicious use of these medications in children with disruptive behaviour disorders. We have been actively promoting the use of the Canadian Alliance for Monitoring Effectiveness and Safety of Antipsychotic Medications in Children (CAMESA) guidelines through two knowledge translation grants, as well as recruiting patients for a prospective cohort study based on these guidelines. In partnership with child psychiatrist Dr. Daniel Gorman at the Hospital for Sick Children in Toronto, Dr. Pringsheim recently received a knowledge translation grant from the Sick Kids Foundation and the Royal Bank of Canada. The grant will assist with developing a residency educational curriculum in order to better understand how to assess and manage aggression in children with disruptive behaviour disorders.

Members

Neurologists:

Dr. Justyna Sarna, Dr. Tamara Pringsheim

Nursing:

Tracy Hammer

Administrative:

Leslie Rawleigh



The Urgent Neurology Clinic

Director: Dr. Alexandra Hanson

Overview

The Urgent Neurology Clinic provides a consultation service for patients requiring an urgent neurological assessment in an outpatient setting. Its mandate is to serve patients within one week of their referral and strives to see patients within 72 hours. Further investigations are then expedited so they can be completed in a timely manner. The Urgent Neurology Clinic is a single program that holds clinics at both the Foothills Hospital and The South Health Campus.

Highlights

In the past year, the Urgent Neurology Clinic has been working closely with neurology central access and triage to ensure all patients are seen in the appropriate neurology clinic. Ultimately, the goal is for a seamless continuum between the Urgent Neurology Clinic and the general neurology clinics.

Members

Physicians:

Dr. F. Amoozegar, Dr. P. Barber, Dr. R. Bell, Dr. J. Burton, Dr. K. Busche, Dr. L. Cooke, Dr. P. de Robles, Dr. T. Feasby, Dr. S. Furtado, Dr. A. Hanson, Dr. J. Kohli, Dr. J. Sarna, Dr. T. Watson, Dr. M. Yeung, Dr. K. Alikhani, Dr. S. Chhibber, Dr. L. Korngut, Dr. W. Murphy, Dr. D. Patry, Dr. D. Pearson, Dr. S. Subramaniam, Dr. K. Wiltshire, Dr. C. White

Nurses:

J. McNamara (C. Brigden, A. Jivraj, J. Ford, K. Lau) L. Sorge

Clerks:

D. Gyonor, C. Oria A. Ritter



The General Neurology Program

Director: Dr. Kevin Busche

Overview

The General Neurology Program involves many of the members of the Division of Neurology. These members provide outpatient clinical services to patients at each of the four adult hospital sites.

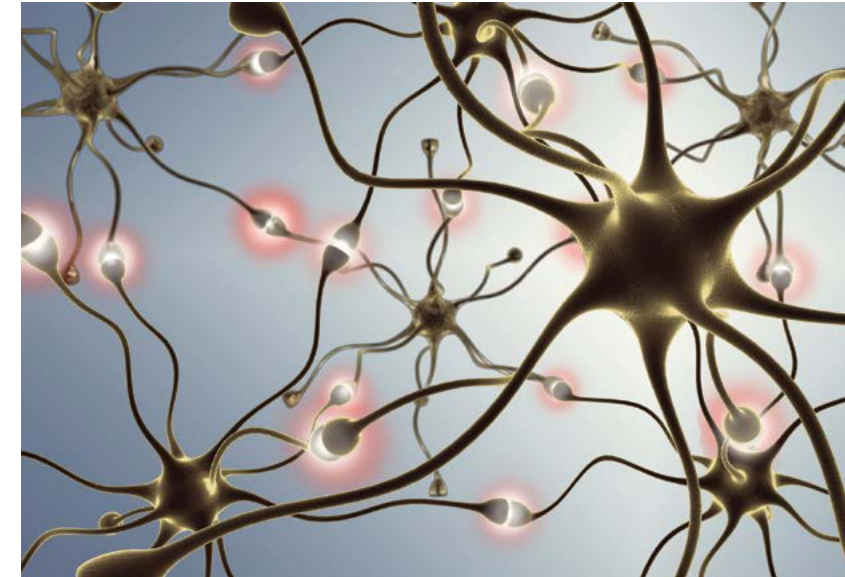
Highlights

Over the past several years, we have worked to develop a Central Access and Triage (CAT) system for general neurology. This system is now taking referrals and booking patients for all of the hospital-based general neurologists in the division. This has allowed us to have a much better understanding of the work being done in general neurology. It has also helped us to provide better patient care by recognizing more urgent referrals on a consistent basis and also recognizing patients that would be better served by an appointment in one of the subspecialty clinics.

The development of the CAT system spurred the development of a general neurology program. Prior to this, there were many neurologists individually seeing general neurology patients. Throughout the last year, we have moved towards bringing together the individual general neurologists under the umbrella of the program. In August 2013 we had our first meeting of the general neurology program and we are working to build common processes for booking patients and providing better clinical care.

With the development of the program, we have been better able to measure, on a system-wide basis the need for general neurology services. Currently, there

is a long waiting list for the general neurology clinics and work is already underway to find innovative ways to provide services for this patient group.



Education

Residents, clerks and junior medical students commonly spend time in the general neurology clinics.

Members

K. Hoyte, B. Klassen, M. Yeung, F. Amoozegar, S. Chhibber, G. Klein, W. Murphy, S. Subramaniam, K. Alikhani, J. Davenport, K. Wiltshire, D. Pearson, D. Patry, K. Busche, K. Brownell, J. Burton, M. Hill, P. de Robles, A. Hanson, P. Barber, M. Koch



Pediatric Neurosciences

Dr. Jong Rho, Division Head

Overview

The Section of Pediatric Neurology based at the Alberta Children's Hospital (ACH) provides neurological care to the children of southern Alberta and neighbouring Saskatchewan and British Columbia. Dr. Jong Rho leads a dozen child neurologists and an extensive team of trainees and allied health professionals. Excellence in clinical care and research spans all elements of child neurology including: epilepsy, neurotrauma and stroke, headache, demyelinating and other neuro-immune conditions, neonatal neurology and brain malformations, neuromuscular and movement disorders, as well as developmental and cognitive, neurogenetic and metabolic disorders.

Clinical Care

Round-the-clock urgent care is provided through inpatient on-call service and outpatient urgent neurology clinics. Integrated collaborations across multiple paediatric specialties provide comprehensive, cross-disciplinary care. Pediatric Neurology cares for over 700 inpatients annually. Outpatient clinics have increased to nearly 5,000 family visits per year including general neurology and numerous subspecialty clinics. Multiple clinical innovation projects and quality improvement and assurance initiatives have been regularly implemented.

Education

Our Residency Training Program remains fully accredited, has grown to seven residents, among the largest in Canada. We continue to maintain a 100 per cent success rate on the Royal College exam. All section members are actively engaged in teaching through undergraduate, medical school, residency, graduate student, and post-doctoral fellowship levels. A rich educational environment now includes more than 10 academic rounds and conferences per week.

Research

Supported by the Alberta Children's Hospital Research Institute (ACHRI) for Child and Maternal Health and the Hotchkiss Brain Institute (HBI), our Section continues to experience significant academic growth. Major operating and program grants are held from agencies including CIHR, NIH/NINDS, AIHS, HSFC, NeuroDevNet, CPIRE, and ACHRI. Further, multiple knowledge translation initiatives have directly impacted the clinical care of families.

Research

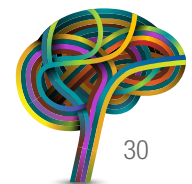
- more than \$1.5 million in active external funding (brain metabolism, neurotrauma & stroke programs)
- more than 40 peer-reviewed original papers, 12 book chapters, and 80 scientific abstracts
- more than 30 invited presentations at major national and international meetings
- more than 200 per cent growth in research trainees across diverse levels and disciplines



Faculty from left-to-right: Jeffrey Buchhalter, Morris Scantlebury, Harvey Sarnat, Karen Barlow, Adam Kirton, Laura Flores-Sarnat, Luis Bello-Espinosa, Alice Ho, Michael Esser, Jong Rho; not pictured: Jean Mah, Alison Moore



Alberta Children's Hospital (ACH)



The Division of Neurosurgery

Dr. John Wong, Interim Head, Neurosurgery



Overview

The Division of Neurosurgery, at the University of Calgary and Alberta Health Services, is fully integrated with its partner sections of Neurology, Physical Medicine and Rehabilitation (PM&R) and Experimental Neurosciences within the Department of Clinical Neurosciences. Within the confines of this highly integrated and programmatic approach, sub-specialized care is provided to our patient population. This population includes the geographic region of southern Alberta as well as the eastern British Columbia in the Kootenay Region and western Saskatchewan, encompassing an approximate catchment population of 2.5 million. Care is provided by 14 neurosurgeons, all of whom provide general neurosurgery; with each physician also sub-specializing in one or more aspects of neurosurgical practice.

Specialized programs include cerebrovascular and endovascular neurosurgery, epilepsy neurosurgery, neuro-oncology and skull base surgery, pediatric neurosurgery, peripheral nerve surgery, functional neurosurgery, stereotactic radiosurgery and multidisciplinary spine care and surgery. In partnership with:

neurology, PM&R, orthopedic surgery, interventional neuroradiology and radiation oncology, our members provide the highest quality of sub-specialized care for this patient population. In all, the total interventional volume delivered by neurosurgeons was approximately 2500 cases in 2012, with nearly 2,000 operative cases in the Foothills Medical Centre and Alberta Children's Hospital operating room sites. There were another 200 cases of bedside and Intensive Care Unit procedures, approximately 250 cases of endovascular procedures in the neuro-interventional suite and roughly 100 radiosurgery cases.

Highlights

- Dr. Garnette Sutherland received the Queen Elizabeth Diamond Jubilee Medal in 2012.
- Dr. John Kelly was recruited back to Calgary after completing a surgical neuro-oncology fellowship at Memorial Sloan-Kettering Cancer Center in New York City. Having already completed a PhD in stem cell biology with Dr. Sam Weiss at the Hotchkiss Brain Institute during his neurosurgical residency, Dr. Kelly has joined the neuro-oncology program and will be developing a basic science laboratory studying brain tumor stem cells.
- For the sixth year running, the highly-regarded Spine and Peripheral Nerve Anatomy and Surgery Course exposed residents from across the country to the nuances of spine and nerve surgery in a hands-on, educational and supportive environment.
- Numerous respected professors and neurosurgeons visited our centre this past year. Our academic highlight remains the Charles Taylor Memorial Lectureship that pays homage to Calgary's first neurosurgeon. In 2013, Dr. Raymond Sawaya from the MD Anderson Cancer Center was the 9th Annual Charles Taylor lecturer.



From left to right: Dr. Garnette Sutherland, Dr. Philippe Mercier, Dr. Aaron Hockley

Photo Credit: Tomas Hirmer

Education

The neurosurgery residency training program continues to grow and develop. Two new residents are accepted each year, with a current allotment of 12 trainees. The program prides itself on providing training in a collaborative and collegial environment where the highest quality of service and education are delivered. In addition to hands-on and didactic teaching of residents, the faculty contributes significantly to undergraduate medical education teaching in the small group curriculum as well as clerkship rotations. In 2012, there were 12 fellows in various sub-specialty domains.

Research

Members continue to be involved in intensive research with several of them having peer reviewed and funded basic science and or clinical research programs. Many of these members partner with the Hotchkiss Brain Institute, and several faculty members have been granted full or affiliated membership. Areas of research strength and accomplishment include: clinical trials in spinal cord injury research and basic bench research in nerve regeneration. We also proudly house one of the world's foremost laboratories in robotics for neurosurgery and biomechanical device development to combat stroke.

Photo Credit: Tomas Hirmer



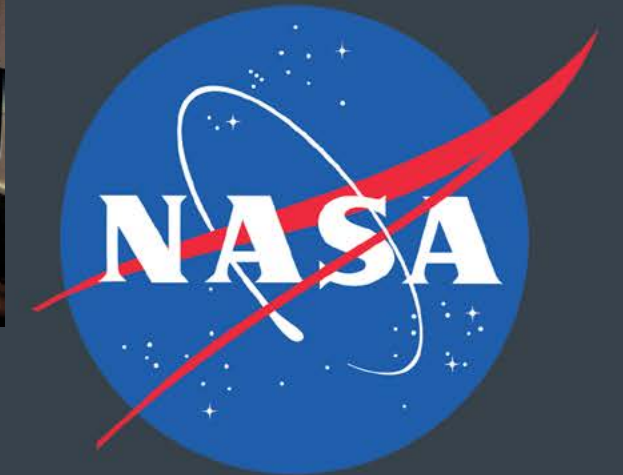
Advancing Technology

Dr. Garnette Sutherland is Recognized
by NASA for Advancing Medical
Robotic Applications

Advancing neurosurgery through space technology, Dr. Garnette Sutherland, professor of neurosurgery, has been recognized by NASA. Dr. Sutherland has been nominated and selected to receive an award for his work on the neuroArm and its medical robotic applications at the 2nd Annual ISS Research and Development Conference titled, "Discoveries, Applications and Opportunities" in July 2013 in Denver.



Dr. Garnette Sutherland is Professor of Neurosurgery in the Department of Clinical Neurosciences at the University of Calgary. His evolving research interests range from fundamental bench research to clinical integration. He has attracted over \$50M in external peer-reviewed funding.



In collaboration with the National Research Council Institute for Biodiagnostics, Dr. Sutherland first developed an intraoperative magnetic resonance imaging (iMRI) system based on a moveable 1.5T magnet. Then in 2002, in order to take full advantage of the iMRI environment, Dr. Sutherland developed neuroArm an image-guided MR-compatible robotic system for stereotaxy and microsurgery. The robot has earned Dr. Sutherland a number of awards including the 2007 Alberta Science and Technology Leadership Foundation award for outstanding leadership in Alberta technology and the 2008 City of Calgary Signature Award. In 2012, Dr. Sutherland was also honoured as a member of the Order of Canada for his lifetime achievements in the field of medical innovation.

Performing microsurgery and image-guided biopsies, the neuroArm is controlled by a surgeon from a computer workstation. It successfully translates space technology into the neurosurgical operating room by using a remote workstation to centralize and fuse imaging data. It has two arms that can hold surgical tools while the surgeon maneuvers them from a remote workstation.

The workstation provides specific data including: magnetic resonance imaging (MRI), a three-dimensional image of the surgical field, sonic information, and measurable haptic (or tactile) feedback from tool-tissue interaction. This data enables the surgeon to experience the surgery through sight, sound, and touch. And because the human brain makes decisions based

on sensory input and experience, this data enables the surgeon to make the most informed choices possible during surgery.

Technologies like MRI can help in surgical planning, resection control, and quality assurance. Magnetic-resonance-compatible robotics also provide real-time imaging which includes information about anatomical structures and changes in the brain relative to surgical pathology while operating, thereby minimizing risk. The neuroArm gives surgeons real-time access to the most current patient imaging, as well as connectivity to information from around the world.

The robotic surgery has the potential to advance beyond the scope of unaided human capability. Motion scaling allows the robotic arms to mimic the exact movements of the surgeon's hands but on a much smaller scale. Miniaturization of the components creates increasingly dexterous robotic movements, which will eventually match, and potentially surpass, the capabilities of the human hand.

When molecular imaging technology combines with these advances in robotic surgery, this paradigm has the potential to convert the scope of surgery from the present level of the organ to outside the range of the human senses and into the cellular dimension. Dr. Sutherland's technology is currently used by neurosurgeons, endovascular surgeons and oncologists at sites around the world. Congratulations to Dr. Sutherland on this remarkable achievement!



Neurosurgery Nurse Practitioners from left to right: Patricia Long, Ron Prince, Carla Dean, Lorna Estabrooks

Coordinate Patient Care

Acute Care Neurosurgery Nurse Practitioners Help to Coordinate Patient Care

Bridging the communication and care gap between the role of nurses and physicians, a nurse practitioner (NP) wears many hats. Ron Prince, a current neurosurgery NP at the Foothills Medical Centre (FMC), was part of the second class to graduate from the NP program in 2002. “We become involved with the patient from the moment they enter emergency. Our main role is to co-ordinate the care of patients,” he says.

The University of Calgary started offering the Acute Care NP program in September 2001. There are two streams within the program; students may take the NP program concurrently with a master’s of nursing (MN) degree or there is a post-master’s certificate route available to registered nurses with an MN degree. The purpose of the acute care nurse practitioner is to provide advanced nursing care, across the continuum of care, to patients who are acutely and critically ill.

NPs work with neurosurgeons to diagnose medical conditions and to help develop treatments. Complex acutely ill patients are assessed through health history, physical and mental status examination and health risk appraisal. Diagnostic reasoning, advance therapeutic interventions, consultation and referral to other nurses, physicians and other providers are key components of the role. The acute care NP

incorporates and applies the theories of nursing, including functional and psychosocial assessment with a focus on individualized patient care. Care is provided using a collaborative model involving patients, families, significant others, nurses and other health care providers.

Neurosurgeon Dr. John Hurlbert, initially proposed the program to The University of Calgary in 2001. He says, “At the time, we had grown from six neurosurgeons to 10 and as the need for more patient beds started increasing, we also needed our residents in the operating room where they could learn. The patient’s needs – weren’t just at 8 a.m. and 7 p.m.—their needs were around the clock.” He says this is what created the gap in care and why there was a need for the nurse practitioner role. “We proposed the need for the position to the Calgary Health Region and we originally received approval to hire six nurse practitioners.”

As is the case today, Dr. Hurlbert says it was not easy to find qualified nurse practitioners at the time so he approached The University of Calgary to discuss the possibility of starting a nurse practitioner program. The program was approved and the first class started in 2001. The current NP program is two years in length and includes a one-year practical internship.

The Division of Neurosurgery currently has four acute care nurse practitioners on staff at the Foothills Medical Centre. The NPs at FMC include: Ron Prince, Patricia Long, Carla Dean and Lorna Estabrooks. Kelly Bullivant is the NP on staff in neurosurgery at The Alberta Children’s Hospital. Carla Dean, says, “It’s the training we receive from the medical professionals – during the program—that really sets us apart.”

As part of the program, NPs receive training from both residents and physicians. They complete rotations in different medical areas similar to a resident’s medical training, residents also become their mentors. Carla Dean says, “We start everyday by doing rounds with the physicians.” Dean says she became interested in becoming a nurse practitioner

because she was looking for a new challenge. “I was really interested in learning more about what it was like to work closer to the physicians.” She says the program is also unique in that some of the NPs have worked previously as registered nurses in other areas outside of neurosurgery before becoming an NP. “Their knowledge and expertise helps the neurosurgery NPs gain a better understanding of these other medical areas. There is always a lot to learn from each other,” she says. NP’s will often teach and mentor nursing students as well.

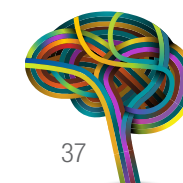
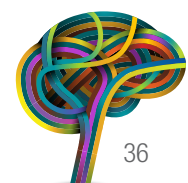
Dr. John Hurlbert says high value is placed on the NP role. “If we had just one nurse practitioner move on, it would have a huge impact to the quality of care we can provide to our patients.” The role has a positive impact on both reduced re-admission rates and shorter lengths of stay in the hospital. “We help to ensure our patients are going home in a timely and safe fashion and we provide continuity in care once they leave the hospital,” says nurse practitioner Ron Prince.

He adds, “The Division of Neurosurgery has been very supportive of the integration of the role right from the beginning, whether that meant opening up doors so we may spend time with neuroradiology or psychiatry, or wherever it was we felt we needed to be in order to provide the best possible care.” With the NPs taking on a greater role by making a diagnosis, ordering tests and communicating with patients and families, it also frees up time for the neurosurgeons to spend valuable time in the operating room.

For more information on the Post-Master’s NP program go to: www.nursing.ucalgary.ca/gradprogram.



Dr. John Hurlbert



Successful Treatment

A Deep Brain Stimulation Study Offers Relief for a Patient with Severe Depression

Lisa passes her driver's license across the desk and says, "This is a picture of me four years ago and I'm actually smiling." From the photo, it's difficult to see that she is smiling. For Lisa, it's been a long and painful road to recovery as she recounts struggling with severe depression for the last 30 years. "Strangers would walk up to me in malls and grocery stores and ask me if I was doing OK or if I was sick," she says. This happened so often, she had just accepted it as a regular occurrence.

"I thought I was doing fine but I remember a teacher's assistant at university who pulled me aside and said, I think you may be suffering from depression," she says. There is a history of depression in Lisa's family although no one ever talked about it. Her first signs of struggle showed up in her inability to concentrate and focus on simple things. Gradually, she found many of her long-term relationships started to slip away until eventually just rinsing out a glass or getting out of bed in the morning became a huge task for her. She was in her thirties when she first began noticing significant changes in her life resulting from depression. "My interactions with people weren't the same, my relationships deteriorated and I eventually lost support from my friends," she says.

Finally, Lisa's psychiatrist told her about a Deep Brain Stimulation (DBS) procedure. "It was my faith in my doctor that allowed me to take advantage of the study. At the time I didn't have the cognitive functions to fully research it, weigh options and think about the risks. The respect I have for my psychiatrist made it possible for me to go ahead with the surgery with confidence," she says.

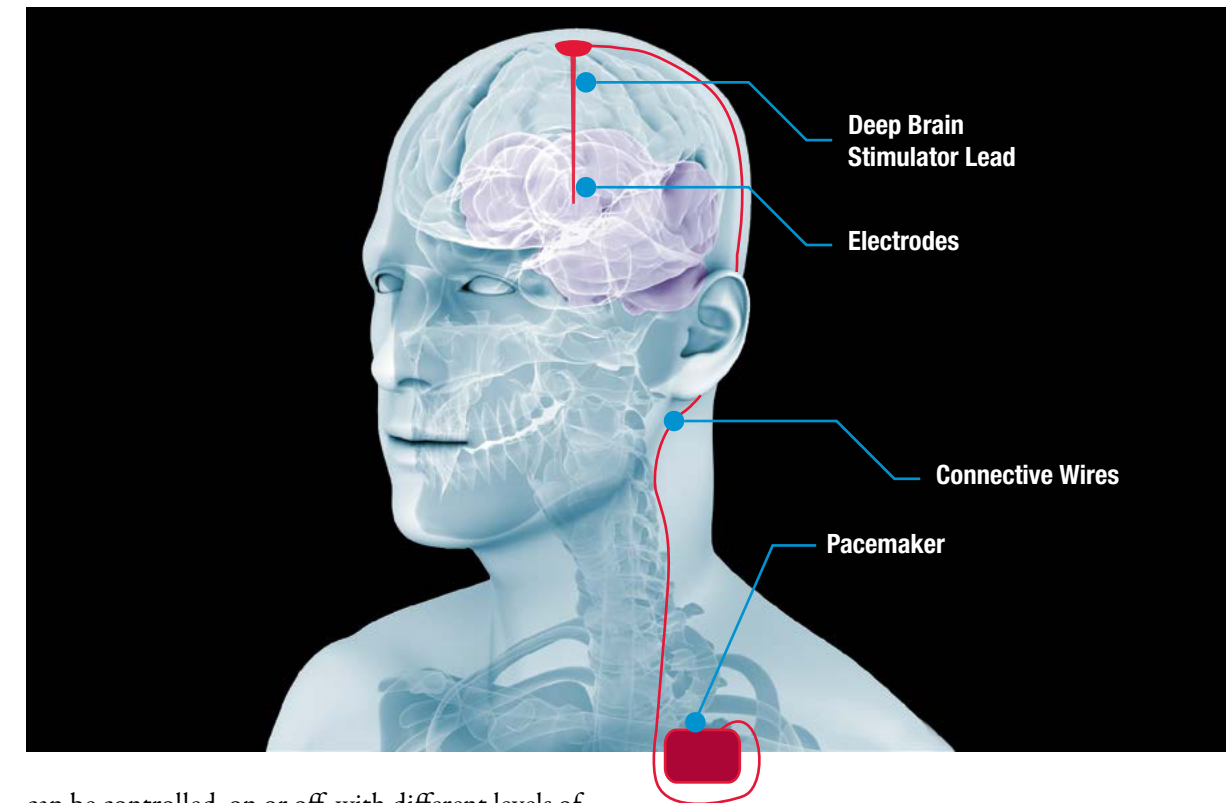
Deep brain stimulation (DBS) is used as a treatment for movement disorders, including essential tremor, Parkinson's disease and dystonia. It has also recently



Dr. Zelma Kiss

emerged as a viable option for treatment-resistant depression (TRD) and it is being studied as an experimental treatment for cluster headaches, Tourette syndrome and chronic pain. As a last resort, and after trying countless anti-depressants, Lisa decided to take part in the clinical trial DBS study led by associate professor of neurosurgery, Dr. Zelma Kiss and Raj Ramasubbu of Psychiatry.

The six to eight hour surgery—which takes place with the patient fully awake—involves implanting electrodes within certain areas of the brain. These electrodes produce electrical impulses that regulate abnormal impulse, which in turn, affect certain cells and chemicals within the brain. The amount of stimulation is controlled by a pacemaker-like device placed under the skin in the patient's upper chest. A wire travels under the skin and connects this device to the electrodes in the brain. In the study Lisa was part of, electrode adjustments were done weekly for the first three months after surgery and bi-weekly for the following three months. Each electrode contact



can be controlled, on or off, with different levels of electricity. Finding which contact works best is done through trial and error as the patient describes what feels right. A psychiatrist is also on hand to assess the clinical outcome of the changes.

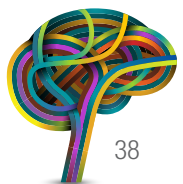
The study was made possible through a clinical research unit pilot grant in 2007 and Lisa says it's allowed her to turn a corner with her illness; she's now forging new relationships and enjoying her life again. "We could tell right away it helped—just not to what degree—until my mother had a fall two weeks after my surgery. I was suddenly faced with her hospitalization and the added stress of moving to another city temporarily to help her. Yet, when I looked back on it, I realized how well I had handled the stress of the situation," she says.

Lisa says, while the changes were not evident immediately, eventually she realized something was different. As the stress with her mother subsided, she began to hear from others who were also noticing she had changed. "I was talking to my neighbour one day and she stopped the conversation to tell me that I looked different, that my eyes were brighter." Now in full recovery from depression, Lisa says she is still learning how to cope with everyday tasks but that her life is much improved. "I have tone in my

voice again, the sound of my voice used to be very flat," she says.

She has recently booked a cruise to Alaska for two weeks and for the first time, she is truly excited about it. "I can't think of anything in my life that hasn't improved. I've come off of seven medications in the last two years and the smallest things will now bring a smile to my face," she says. Lisa says her advice to others who are battling severe depression is "to take care of yourself first and to keep trying new approaches to make your life easier."

As part of the study, Lisa is also participating in cognitive behavior therapy (CBT). CBT aims to teach people new skills, on how to solve problems concerning dysfunctional emotions, behaviors and cognitions through a goal-oriented, systematic approach. "Without CBT, my recovery would have taken a lot longer. It's also helped me to get back the life back I was leading prior to my depression." The DBS pilot study Lisa was part of four years ago had four participants opting for the surgery. The next study, funded as a Collaborative Research and Innovation Opportunities (CRIO) project by Alberta Innovates -Health Solutions (AIHS), will take place in 2013 with 25 participants.



Improving Access

The Spine Triage Clinic is Improving Patient Access to Surgical Evaluations



Dr. Stephan DuPlessis

The Spine Triage Clinic at The Foothills Medical Centre has been in operation for four years now. The triage clinic gives referred patients—especially surgical candidates—faster access to a medical evaluation for their spine problems. This year, they have seen close to 2,000 neurosurgery patients at the clinic. Dr. Stephan DuPlessis, assistant professor of neurosurgery says it often becomes difficult to determine for sure what the patient's spine problems may be. Currently, there are two medical spine physicians working in the clinic.

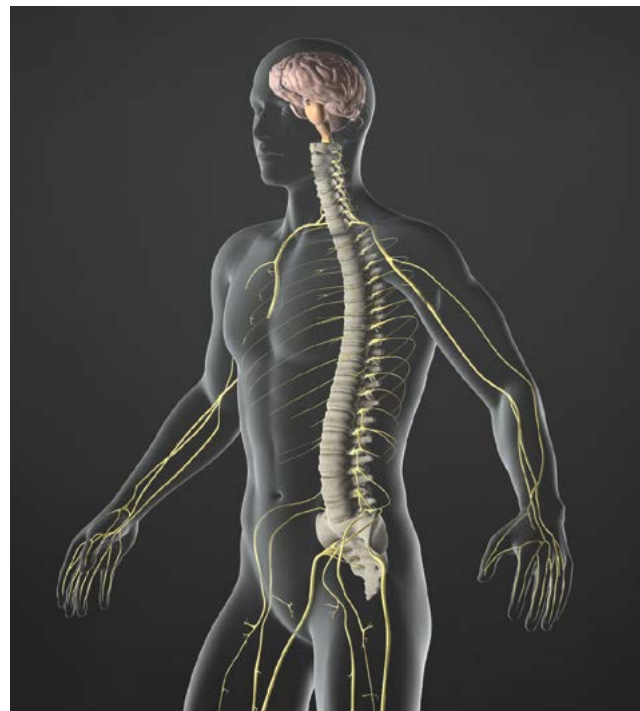
“The physicians are trained to identify patients who are in need of surgery and to help guide and direct the treatment of patients who do not require surgery. For example, patients who do not require surgery may be in need of more physiotherapy or they may need to be booked for an MRI,” Dr. DuPlessis says.

The clinic helps to identify and evaluate those patients who are in the greatest need of further assessments. Dr. DuPlessis says, “We may see 10 or 15 patients in a clinic but only one or two of them will require surgery. Our goal is to identify those patients who we can help surgically. Typically, these patients need to have surgery or they would benefit from surgery,” he says.

Once a need for surgery is established, Dr. DuPlessis says it can take approximately nine months for the patient to be booked. Currently, there is an overall increase in the need for surgeries due in part to an increase in the aging population. DuPlessis says the clinic is a work-in-progress as they work to refine the referral process for all spine patients. A new database is also being established to capture patient data at the clinic. The database will be used to gather demographic information which will identify some of the causes, distribution and control of spinal problems.

“We ask patients what they expect from the meeting and why they are at the clinic. Many of them have back pain but some are just looking for: more information, a second opinion or information on a new procedure,” he says.

“Collecting the patient information first, allows us to understand where the gaps are and if we may need to direct them to an educational site for more information.”



The Hydrocephalus Program

Director: Dr. Mark Hamilton

Overview

In 2003, the University of Calgary's adult hydrocephalus clinic was established with the goal to standardize and enhance the care for adult patients with hydrocephalus. Hydrocephalus patients had typically been assessed and cared for by individual physicians in an unstructured and unfocused clinic environment. The population of adult patients with hydrocephalus is increasing as diagnostic and therapeutic techniques improve identification and survival of treated patients. Hydrocephalus represents a treatable cause for approximately five per cent of adult patients with a diagnosis of dementia.

The University of Calgary Adult Hydrocephalus Program has developed in response to the strengths of the adult hydrocephalus clinic. Targeting the care of adult patients with hydrocephalus in a specialty clinic, has aided in understanding the natural history of adults with untreated hydrocephalus. The program has helped to standardize the treatment strategies for patients with a potential diagnosis of hydrocephalus and it has helped to improve the management of patients with hydrocephalus using shunts and endoscopic techniques. Clinical research is progressing in these areas. The goals of the Adult Hydrocephalus Program are to provide excellent care for adults with hydrocephalus and to improve the care of adults with hydrocephalus through education, research and advocacy.

In 2013, there are approximately 1,000 patients were followed in the adult hydrocephalus clinic. There were approximately 450 outpatient assessments and 110 surgical procedures performed. This population includes patients who initially had a diagnosis of hydrocephalus as a child, adults with acute and sub-acute hydrocephalus, adults with previously untreated congenital hydrocephalus and patients with idiopathic normal pressure hydrocephalus.

Highlights

- Continued expansion of the hydrocephalus clinic.
- Initiation of the Adult Hydrocephalus Clinical Research Network (AHCN).

- Graduation of the first adult hydrocephalus fellow who now works in the clinic.
- Dr. Hamilton led a hydrocephalus course at the Canadian Neurological Sciences Federation meeting held in Ottawa in June 2012.
- The program organized a meeting with the spina bifida and Hydrocephalus Association of Ontario and Canadian neurosurgeons and neurologists to begin developing a Canadian hydrocephalus strategy.

Education

The Hydrocephalus Program offers fellowship training for neurosurgeons interested in subspecialty training in the diagnosis and management of adult patients with hydrocephalus. The first trainee completed his fellowship training in June 2012.

Research

- Initiation of the adult section of the Hydrocephalus Clinical Research Network
- Neuroendoscopy treatment and outcome for adult patients with hydrocephalus
- Neuropsychological effects of endoscopic treatment of patients with hydrocephalus
- Infections in patients with ventricular catheters and shunts
- Treatment of patients with idiopathic normal pressure hydrocephalus
- Transition care for pediatric patients with hydrocephalus
- Endoscopic management of patients with ventricular brain tumors

Members

Neurosurgeons: Dr. Mark Hamilton, Dr. Clare Gallagher, Dr. Walter Hader
Medical and Surgical Assistant:

Dr. Geberth Urbaneja

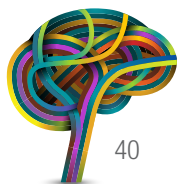
Neurologist: Dr. David Patry

Neuro-Ophthalmologists: Dr. Fiona Costello,

Dr. Bill Fletcher, Dr. Suresh Subramaniam

Geriatrician: Dr. David Hogan

Nurse Practitioners: Ron Prince, Lorna Estabrooks



Intraoperative Imaging Program

Director: Dr. Garnette Sutherland

Overview

The intraoperative MRI (iMRI) program uses a ceiling mounted 3.0T magnet. The system has been used in neurosurgery in over 550 cases. Together with the original 1.5T iMRI system, the cases number over 1,500. Several years ago, this technology was spun into a company called IMRIS that now has 55 international sites.

Highlights

We attended multiple international presentations this year including:

- The Joint Neurosurgical Convention 2013. MR-Guided Robotic Surgery in Waikoloa, Hawaii in January.
- The 2nd Annual ISS Research and Development Conference. *Advancing Neurosurgery through Space Technology* in Denver in July.

- We were awarded CIHR-CMAJ Top Achievements in Health Research, 2013 and NASA-ISS Top Utilization of International Space Station for Medical Advancements-Terrestrial Applications in 2013. We also presented neuroArm to the U.S. Congress.

Education

This year we purchased surgical simulation technology, to be used for both for neurosurgical and general surgery applications. Funding was acquired to establish a medical robotics program at the University of Calgary. Components include a surgical performance haptics research laboratory, an advanced engineering prototyping lab, an experimental operating room and a telementoring and debriefing room.

Research

Our research includes intraoperative imaging and robotics. Project NeuroArm resulted in the development of an MR-compatible image-guided robot called neuroArm. The system has been used in over 50 surgeries. The technology was also used in IMRIS, and the commercial robot called SYMBIS, is now in development.

Members

Kourosh Zareinia, Liu Shi Gan, Sanju Lama, Stefan Wolfsberger, Gail Kopp, Chris Macnab, Yaoping Hu, Salvatore Federico, Peter Goldsmith, Qiao Sun, Roger Mackenzie, Boguslaw Tomanek, Tomas Hirmer, Fang Wei Yang, Pam Leblanc

Industrial Partners:

MDA (Brampton, Ontario)
IMRIS (Minneapolis, Minnesota)



Photo Credit: Tomas Hirmer

Neuromodulation Program

Director: Dr. Zelma Kiss

Overview

Neuromodulation is the altering/modulation of the nervous system function by means of implantable devices or neural prostheses. It includes peripheral nerve, spinal cord and brain electrical stimulation as well as, drug delivery devices. Numerous conditions are treated including: movement disorders, epilepsy, pain, angina, treatment refractory depression, headache, spasticity, gastroparesis and urinary incontinence. Other divisions within DCNS, as well as specialists from several departments, are involved in the program.

Highlights

This past year we received an Alberta Innovates-Health Solutions: Collaborative Research and Innovation Opportunity Project Grant for \$383,947 to research deep brain stimulation (DBS) for treatment-resistant depression. (see story page 38)

Education

Our training program attracts: residents, graduate students, and post-doctoral fellows, all of whom show keen interest in the program. Pain neuromodulation journal clubs occurred twice this past year, facilitating all levels of continuing education. There will be ongoing educational activities for nursing staff and trainees through industry interactions and AHS contracts.

Research

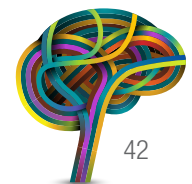
We published novel data in the Canadian Journal of Neurological Sciences on *Occipital stimulation for chronic migraine*, and in the Journal of Psychiatry and Neuroscience on *Double-blind optimization of subcallosal cingulate deep brain stimulation for treatment-resistant depression*. Our prospective study stimulation for craniofacial pain syndromes continued with higher patient enrolment. Dr. Andrews is writing a prospective study of the first seven diabetic gastroparesis patients to undergo this treatment in Alberta.

Future Direction

Over the next year, we will be implementing a new web-based secure database for movement disorder surgery patients through the Rose Family Funds and the Hotchkiss Brain Institute (HBI). As a result of our success in the AIHS CRIO grant competition, we will be focusing on deep brain stimulation (DBS) for depression over the next three years. In collaboration with Dr. Casha, we plan to establish a protocol for this patient group. In addition, collaborations with palliative care are planned for the management of long-term cancer patients requiring intrathecal narcotics. We look forward to welcoming Dr. Gillian Simonett from psychiatry to the pain neuromodulation group.

Members

Cardiology: Drs. Jim Stone, Jonathan Howlett
Gastroenterology: Drs. Christopher Andrews, Phil Mitchell
Neurology: Drs. Werner Becker, Scott Kraft, Neelan Pillay, Ranjit Ranawaya, Jong Rho, Sam Wiebe
Neurosurgery: Drs. Zelma Kiss, Mark Hamilton, Walter Hader, Yves Starreveld
Nursing: Susan Anderson, Cheri Gray, Colleen Harris, Brittany Hoffarth-Palchewich, Karen Hunka, Jackie Martini, Valerie Sherwood, Pia Lawrence, Raj Parmeer
Pain physicians: Drs. Darryl Guglielmin, John Pereira, Martin Scanlon, Kelly Shinkaruk, Chris Spanswick (Chronic Pain Centre), Dr. Peter Farran (ACH)
Physical Medicine and Rehabilitation: Drs. Dan McGowan, Noorshina Virani, Chester Ho
Physiotherapy: Cliona Corbett
Psychiatry: Drs. Jeremy Quickfall, Raj Ramasubbu, Aaron Mackie
Psychology: Drs. Arlene Cox, Stewart Longman
Research: Dr. Bin Hu
Urogynecology: Drs. Magali Robert, E. Brennand



Neurovascular Program

Director: Dr. John Wong



Overview

Treatment of vascular diseases of the nervous system has been evolving over the past decade to encompass less minimally invasive interventions. The neurovascular program is a joint collaborative effort of specialists and allied healthcare staff from multiple disciplines to combat stroke and neurovascular disease. Many patients are treated in a single day, using minimally invasive approaches thereby avoiding long hospital stays. In conjunction with our internationally recognized stroke team, the neurovascular program has become an important partner in stroke care and research.

Highlights

Approximately, 700 patients with neurovascular disease were seen the past year in our specialized outpatient clinic for evaluation and follow-up. Currently about 250 patients are treated annually via minimally invasive endovascular means such as aneurysm coiling, vascular malformation embolization, carotid stenting, and endovascular stroke treatment. An integrated relationship with the Alberta Radiosurgery

Centre, which was the first to use special shaped-beam focused radiotherapy techniques in Canada, has allowed the non-invasive and safe treatment of patients with complex arteriovenous malformations. Over the years, we have consolidated the outpatient experience and launched the Neurovascular Clinic in Calgary in conjunction with specialists from neurosurgery, neurology, radiology, and nursing. This has allowed the rapid same-day triage and evaluation of stroke patients to provide high-quality care, and further opportunities for teaching and clinical studies.

Education

Educational highlights have included the recruitment of two clinical fellows in the training of endovascular techniques and the funded development of a nursing fellowship in cerebrovascular disease.

Research

Academic initiatives have centered upon the development by Dr. Mitha of a basic science laboratory dedicated to the study of new intravascular devices for stroke care and the Calgary-initiated international multicenter randomized study of acute stroke intervention (ESCAPE) led by Dr. Goyal and Drs. Hill and Demchuk from the Calgary Stroke Program.

Members

John Wong, Alim Mitha, Garnette Sutherland, William Morrish, Mayank Goyal, Muneer Eesa

Fellows

Parviz Dolati, Mohammed Almekhlafi

Pediatric Neurosurgery Program

Director: Dr. Walter Hader

Overview

The Pediatric Neurosurgical Program offers all aspects of pediatric neurosurgical care including: management of hydrocephalus, brain and spinal injury, myelomeningocele, other forms of spinal dysraphism, refractory epilepsy surgery, spasticity, craniofacial disorders, and pediatric brain tumour in conjunction with the pediatric neuro-oncology group. The program is a division of pediatric surgery and the members are also part of the Division of Neurosurgery within DCNS.

Highlights

The pediatric neurosurgeons provide weekday call at the Alberta Children's Hospital (ACH). Along with the other members of the Division of Neurosurgery, they participate in evening and weekend call schedules. Neurosurgery clinics are held every week. The Clinics include: general neurosurgery, craniofacial clinic, the infant cranial screening and remodeling clinic and the myelomeningocele clinic. Approximately 2,000 out-patient visits occur each year. Pediatric neurosurgery also continues to be active in the Calgary Epilepsy Program, performing 25 procedures for intractable epilepsy in children. Formal quarterly spasticity rounds, in conjunction with orthopedic surgery, psychiatry and physiotherapy has allowed the multi-disciplinary assessment of a greater number of children with severe spasticity and dystonia for consideration of selective dorsal rhizotomy, baclofen pump implantation and deep brain stimulation.

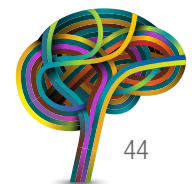
Research

The Pediatric Neurosurgical Division members participate in local and national administrative and educational functions. They also lead and collaborate in clinical research involving: pediatric and adult hydrocephalus, pediatric brain injury, epilepsy and brain tumour. During the last five years, the Pediatric Neurosurgery Program members have

published a number of peer-reviewed manuscripts, book chapters, and abstracts. The Pediatric Neurosurgery Division is an active participant of the Canadian Pediatric Neurosurgery research study group. Dr. Hader was an invited guest at the Saudi Epilepsy Congress in November 2012 at Jeddah, Saudi Arabia. His publications this year included a systematic review of complications of epilepsy surgery and an assessment of memory and quality of life in pediatric epilepsy. Installation of a new 3T MRI for clinical and research use at the Alberta Children's Hospital was recently completed in June 2012. Dr. Gallagher will soon be studying brain metabolism after traumatic brain injury utilizing a novel technique in the 3T MRI, as part of the pediatric trauma initiative supported by the Alberta Children's Hospital and Research Institute.

Members

Neurosurgeons: Dr. Walter Hader,
Dr. Clare Gallagher, Dr. Mark Hamilton
Pediatricians: Dr. Heather Graham,
Dr. Keith Jorgensen
Nurse Practitioner: Kelly Bullivant
Nurse Clinicians: Valerie Sherwood, Linda Gill



PITNET

Directors: Dr. Fiona Costello & Dr. Yves Starreveld

Overview

The Pituitary Inter-disciplinary Team-based Endocrine Treatment Program (PITNET) has now been active for over a year, bringing together neurosurgery, neuro-ophthalmology, otolaryngology and endocrinology to facilitate the care of patients with pituitary tumours.



Education

Due to the high concentration of surgical patients, we have been able to provide focused training on the diagnosis and management of these lesions to residents and visiting neurosurgical fellows, including Dr. Jason Papacostas from Brisbane, Australia.

Research

Current research is focused on: cost-effectiveness, the role of optical coherence tomography in patient follow up, comparisons of surgical approaches. Along with the Department of Anesthesia, we are assessing patients for post-operative nausea and vomiting.

Members

Endocrinology: Dr. Shelly Bhayana, Dr. Bernard Corenblum, Dr. Alun Edwards, Dr. Munish Khosla, Dr. Sue Pedersen, Dr. Doreen Rabi

Neurology: Dr. Fiona Costello, Dr. Bill Fletcher, Dr. Lawrence Korngut, Dr. Michael Hill, Dr. Suresh Subramaniam

Neurosurgery: Dr. Garnette Sutherland, Dr. Alim Mitha, Dr. Yves Starreveld

Otolaryngology: Dr. Brad Mechor, Dr. Luke Rudmik

Highlights

Our combined neurosurgery and neuroophthalmology new patient and follow-up clinic have reduced clinic visits for many patients.

- Dr. Andrew Ryu won the Alberta Neurosurgery Clinical Research Award for his work reviewing vision outcomes in PITNET patients.
- The PITNET team is working with Guideline Utilization Resource Unit (GURU), Cancer-Control Alberta, to revise existing guidelines in the management of pituitary tumours

Peripheral Nerve Program

Director: Dr. Rajiv Midha

Overview

The Surgical Peripheral Nerve Program within the DCNS, is a multi-disciplinary and inter-disciplinary program encompassing clinical, physiotherapy and electro-diagnostic services. Our program focuses on the diagnosis and treatment of a variety of peripheral nerve problems including: complex peripheral nerve injuries, nerve tumors, brachial plexus surgery and advanced nerve repair and nerve transfer techniques. Our goal is to minimize pain and to maximize function, providing a better quality of life for patients living with these painful and sometimes disabling disorders.

Highlights

The regeneration unit in neurobiology (RUN), a Canadian Foundation for Innovation funded project which includes a state-of-the-art behavioral testing suite and advanced imaging and microscopy workstations, was successfully established and became fully operational in 2012. The multidisciplinary peripheral nerve clinic moved to the South Health Campus from the Rockyview General Hospital site in 2013.

Education

We support the educational initiatives of all residents within the three clinical divisions of DCNS and have a robust fellowship program. The following are recent fellows within the Program:

Dr. Helene Khoung (2010-12)
Dr. Ferry Sanjaya (2011-12)
Dr. Chandan Mohanty (2012-2013)

Research

Research is an important aspect of the Peripheral Nerve Program. Over the last few years, we have been conducting a clinical randomized control trial comparing surgical decompression to the best medical management for ulnar neuropathy at the elbow. Three of our faculty members: Drs. Midha, Toth and Zochodne have independent basic science research laboratories in association with the Hotchkiss Brain Institute investigating various facets of peripheral nerve disease. For more information on these research initiatives go to: www.hbi.ucalgary.ca or www.ucalgary.ca/spinalnerve.

Members

Medical Neurologists, Psychiatrists & Electrodiagnostics Team:

Dr. Chris White
Dr. Stephen McNeil

Division of Plastic Surgery Team:

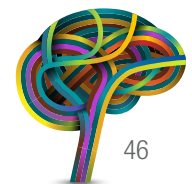
Dr. Christiaan Schrag
Dr. Robertson Harrop

Physiotherapy:

Margaret Hass

Intraoperative Electrophysiology Support:

Michael Rigby
Erin Phillip



Alberta Radiosurgery Centre

Directors: Drs. Robert Nordal and Yves Starreveld

Overview

This program is the first of its kind in Canada and uses a technology called the Novalis system. It is a collaborative effort between the Divisions of Neurosurgery and Radiation Oncology. The technology offers focused radiation treatment for diseases of the brain and spinal cord in single or multiple sessions as appropriate. This avoids lengthy hospital stays associated with standard surgical treatments. By reducing risks of therapy, and a rapid return to normal activities, it offers greater patient satisfaction. Since its inception in 2002, the program has served an increasing number of patients in Alberta and across the western provinces.

Highlights

Referrals to our spine radiosurgery program are increasing. We have started to treat patients with epilepsy, including mesial temporal lobe epilepsy.

Education

The program provides fellowship training for both radiation oncologists and neurosurgeons.

Research

Projects completed this year included a review of the ARC experience in the treatment of trigeminal neuralgia and an innovative study on the effect of contouring variability on dosimetric parameters for brain metastases.

Members

Zelma Kiss, Yves Starreveld, John Wong, Brad Jacobs, Alim Mitha, John Kelly, Gerald Lim, Rob Nordal, Jon-Paul Voroney, Rao Khan, David Spencer, Alana Hudson, Erin Mckimmon, Kari Pickering, Rhonda Manthey, Stacey Allen, Henry Chow, Sarah Blackmore, Darren Graham, Daphne Walrath, Nathan Wolfe

Skull Base and Endoscopic Surgery Program

Director: Dr. Yves Starreveld

Overview

In conjunction with colleagues from the Division of Otolaryngology, the skull-base surgery group combines long experience with novel approaches to offer patients the best surgical treatment and long-term follow-up for these challenging lesions. In addition, close ties to both endocrinology and the Alberta Radiosurgery Centre ensure that the nonsurgical aspects of treatment are also managed appropriately. Endoscopic approaches to pituitary and anterior skull base lesions are also offered when appropriate.

Education

The program offers fellowship training to neurosurgeons. This year we were fortunate to attract Dr. Jason Papacostas from Brisbane, Australia to spend a year with us.

Research

Specific research includes:

- clinical epidemiology, image guidance, robotic surgery and surgical simulation.
- a randomized trial comparing different endoscopic approaches to pituitary tumours
- a retrospective analysis of postoperative nausea and vomiting following endoscopic skull base surgery; being performed in collaboration with the Dept of Anesthesia.

Members:

Alim Mitha, Garnette Sutherland, Joe Dort, Brad Mechor, Phil Park, Luke Rudmik, Erin Phillips, Michael Rigby

The Surgical Neuro-oncology Program

Director: Dr. Mark Hamilton

Overview

As a multi-disciplinary program in DCNS, the Surgical Neuro-oncology Program was established to focus on neurosurgical care for brain tumour patients. The program provides excellent care for patients with brain tumors and it improves care in the future through education, research and advocacy.

Our patients have both low grade and malignant brain tumors, including those involving the brain and the skull base. Neurosurgeons work in concert with neuro-oncologists, neuroradiologists, neuropathologists, and radiation oncologists specializing in the treatment of brain tumours. Regular clinical meetings and teaching rounds occur to co-ordinate care plans for patients. We are also able to offer access to unique treatment modalities such as the intraoperative MRI theatre for assisting in the surgical treatment of brain tumor and intraoperative monitoring or cortical mapping for complex brain tumour resection.

Our program provides:

- Surgical treatment of patients with malignant brain tumor
- Surgical management of patients with low-grade glioma
- Clinical trials for adjuvant treatment of patients with malignant brain tumor
- Treatment wait times and outcomes for brain tumour patients
- Endoscopic treatment of patients with skull base or pituitary tumors

Education

The program provides fellowship training for neurosurgeons who want to develop special skills in surgical neuro-oncology.

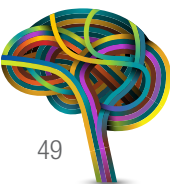
Research

Members of the program are actively involved in clinical research to test new and innovative therapies to treat patients with brain tumours. Dr. Hamilton and Dr. Kelly are members of the Clark H. Smith Brain Tumor Center, The Southern Alberta Cancer Research Institute, and the Hotchkiss Brain Institute as well as, participants in the Terry Fox Research Initiative. All neurosurgeons are participants in multi-center clinical trials, including those involving convection-enhanced delivery of agents into the brain to treat brain tumors and brain tumour vaccines. In addition to this, the Brain Tumor Tissue Bank is available to store tissue from consenting patients for current and future research.

Members:

Neurosurgeons: Dr. Mark G Hamilton, Dr. Yves Starreveld, Dr. John Kelly, Dr. Garnette Sutherland
Surgical Neuro-Oncology Fellow: Dr Qasim Al Hinai
Neuro-Oncologists: Dr. Jay Easaw, Dr. Paul DeRobels, Dr. Greg Cairncross
Radiation Oncologists: Dr. Rob Nordal, Dr Gerald Lim

Nurse Clinician: Crystal Tellett
Research Nurse: Ish Baines



The Division of Physical Medicine and Rehabilitation

Dr. Chester Ho, Head, Physical Medicine and Rehabilitation



Overview

The Division of Physical Medicine and Rehabilitation (PM&R) has 24 members working in a variety of settings from tertiary acute care hospitals to community practices. As a division, our practice focuses on the diagnosis, management and rehabilitation of patients with neurological conditions including brain injury, spinal cord injury and stroke. We also see patients with musculoskeletal problems including: back pain, burn injuries and amputation. We serve the needs of both children and adults across southern Alberta, eastern British Columbia and western Saskatchewan.

The division underwent significant expansion this year with the recruitment of three new physiatrists including: Drs. Chantel Debert focusing on brain injury; Vithya Gnanakumar focusing on pediatric rehabilitation; and Gillian Simonett focusing on spinal cord injury. Dr. Brian Benson, a sports medicine physician, also joined our division as a research adjunct assistant professor.

Highlights

- We had 16 peer-reviewed publications this year.
- Our research funding totaled \$2.6 million. Over the next five years, division members will collaborate as project leads of AIHS CRIO funded projects worth \$10 million.
- Dr. Lee Burkholder received the John E Latter Teaching Award.
- Drs. John Latter and Dan McGowan were named on The University of Calgary Medical School Class of 2014 Hellbender Honor Roll.
- Resident physician Dr. Jordan Raugust received a second prize in The Canadian Association of Physical Medicine and Rehabilitation Best Clinical research poster presentation last June for his project titled, Concussion in pediatric ice hockey players: description of characteristics based on a previous history of a concussion or mild traumatic brain injury.
- In 2012, Dr. Raugust also won the resident essay competition for the the Canadian Association of Physical Medicine and Rehabilitation. (CAPMR) annual meeting in Toronto.
- Resident physician Dr. Vishal Tulsi received first honours for his in-progress research project entitled Economic Analysis of Stroke Rehabilitation Care at resident research day in Calgary
- Resident physician Dr. Janet Tapper won best poster presentation in her group for her project on voxel lesion symptom mapping in stroke at the concluding resident research day of an introductory research rotation.

Education

Our division this year included 11 residents with one transfer from the University of Manitoba. The residency program had 24 applicants for two positions; this was our highest number of applicants to date. Both positions were filled from the Canadian Resident Matching Service (CaRMS). Our graduating residents; Drs. Evan Kwong and Gentson Leung also passed their Royal College exams.

Research

- Alberta Innovates-Health Solutions (AIHS) Collaborative Research and Innovation Opportunities (CRIO) success – Drs. Chantel Debert, Sean Dukelow, Vincent Gabriel and Chester Ho are critical members of research teams which have been awarded CRIO grants by Alberta Innovates-Health Solutions (AIHS). They are members of the Alberta Children's Hospital Research Institute, Hotchkiss Brain Institute and the Institute for Public Health. The areas of focus for the research include: brain injury and concussion, pressure ulcer management and burn rehabilitation.
- Innovative research program development – In conjunction with Alberta Ballet, Drs. Arun Gupta, Chester Ho and post-doctoral fellow Terry Clark of the musculoskeletal (MSK) program have developed a new pre-season screening program for the dancers of Alberta Ballet addressing injury prevention and the overall physical and psychological health of these elite athletes. (see story page 52)
- Research projects with international recognition – As part of the AIHS Smart Neural Prosthetics team, Dr. Sean Dukelow has been leading the feasibility studies of the Smart-e-Pants initiative in Calgary. The project aims to utilize electrical stimulation to prevent pressure ulcer development. This high-profile project has gathered international attention and recognition.

Clinical Care

- Accreditation – The Calgary Brain Injury Program achieved accreditation status by Accreditation Canada in December 2012. Dr. Christine McGovern is the program lead for brain injury.
- Partnership with Alberta Health Services (AHS) Strategic Clinical Networks – The divisions' physiatrists have been working diligently with AHS to create programs to assist with patient care. Drs. Noorshina Virani and Pam Barton worked closely with the AHS Bone and Joint

Strategic Clinical Network for the proposal to enhance musculoskeletal care in the province. Dr. Sean Dukelow has been involved with the Cardiovascular Health and Stroke Strategic Clinical Network advocating for evidence-based practice in stroke rehabilitation in the province. Dr. Ken Lam has been working with the Obesity, Diabetes and Nutrition Strategic Clinical Network to assist with the design and development of an evidence-based program for the prevention and rehabilitative care of people with amputations.

- Innovative program development with Community Accessible Rehabilitation (CAR) – In order to provide comprehensive interdisciplinary care, we have formed a partnership with the CAR program to explore and develop creative models of outpatient rehabilitation clinics. This includes an integrated Stroke Rehabilitation Clinic at the Foothills site and an interdisciplinary Young Adult Clinic at the Sheldon Chumir site.
- New clinical programs at the South Health Campus (SHC) – Drs. Rodney Li Pi Shan and Stephanie Plamondon have started providing PM&R outpatient services at the interdisciplinary Amyotrophic Lateral Sclerosis (ALS) and Neuromuscular Clinics, expanding service to southern Calgary and southern Alberta.



Dr. John Latter is recognized as the founding program director of the PM&R Residency Training Program and for his contributions to residents and their education at a division barbeque held at Glenmore Park this summer.

Physical Medicine and Rehabilitation and Alberta Ballet Join to Develop a Performance Arts Medicine Program

A unique collaboration between Physical Medicine and Rehabilitation (PM&R), a division of the Department of Clinical Neurosciences (DCNS) at The University of Calgary and Alberta Ballet is in the works to develop a centre for Performing Arts Medicine and Science Centre in Calgary. Launched in February of this year, the goal of the program is to engage the dancers in injury prevention training, education and research initiatives. Currently, there are 31 Alberta Ballet dancers taking part in the program.

The program involves ongoing injury assessment clinics that are being set up twice yearly for dancers to have their injuries evaluated by physiatrists and other medical professionals who understand the physical demands associated with dance. Data from these assessments will then be collected by the PM&R research team in order to track the dancers' current injuries and their risk factors for future injuries. The program will look to create an evidence-based practice for the treatment and prevention of performing artists' injuries by integrating their research results into future educational programs.

The collaboration includes; Dr. Chester Ho, Head of the Division of PM&R at DCNS; Dr. Terry Clark, a post-doctoral researcher at The University of Calgary; Dr. Arun Gupta, an assistant professor with the division of PM&R; Dr. Noorshina Virani, an associate professor within the division of PM&R; program founder and Alberta Ballet board member, Dawn McDonald and Alberta Ballet CEO Marty Bragg.



“We bring the dancers through the program on a continual basis while closely monitoring what their particular injury issues may be,” says Marty Bragg, CEO of the Alberta Ballet. Dr. Arun Gupta, a physiatrist involved in the program says, “Typically the majority of the injuries we are seeing are musculoskeletal injuries; however we can also see acute sprains and even fractures.”

The initiative, started by Dawn McDonald, a previous dancer and now a board member with Alberta Ballet, relies on the knowledge and support of the medical team of physiatrists at DCNS. “Physiatrists understand—better than anyone else—what dancers do every day and that’s why the partnership with DCNS is so important to us,” says McDonald.

The principal researcher in the program, Dr. Terry Clark has a background in performance arts medicine programming. His role in the program is to gain an understanding of the dancer’s injuries, recognize how they develop and to create educational programs to support the dancers in the future.

“Given the high demands and requirements of their activities, ballet dancers are at a particular risk of sustaining dance-related injuries. There has also been little progress in understanding and recognizing the specific demands and injury mechanisms of ballet,” says Clark. “We need to generate the knowledge base first as to what is causing the injuries then we need to figure out how to use that knowledge and feed that back to the dancers in order to prevent further injuries.”

Dr. Clark says they will focus on both injury prevention as well as, the long-term health of the dancers including; the relevance of nutrition, overall fitness and coping skills to deal with stress.

“The long-term plan for the program is for the current group to eventually evolve into a larger team which will be equipped to meet the dancers’ needs for further injury prevention training and education. We hope to develop similar assessment clinics, as well as research and educational opportunities within the University of Calgary with a goal to spread out to local arts organizations as well,” says Clark.



New Research...

Is Focusing on Recovery from Concussions in the Youth Population

More research into concussion injuries among the youth hockey population will be conducted with help from the new Safe to Play grant funded by The Canadian Institutes of Health Research (CIHR). Dr. Chantel Debert, an assistant professor in Physical Medicine and Rehabilitation at DCNS, is a co-investigator involved in the study along with other co-investigators; Dr. Sean Dukelow, an assistant professor in Physical Medicine and Rehabilitation (PM&R) and Dr. Brian Benson, an adjunct research assistant professor in PM&R.

Dr. Debert will be studying approximately 1,000 youth hockey players in the pediatric population over a five year period. The study aims to develop normative baseline evaluations using existing and new methodology in this high-risk population. The study will measure the nature and extent of the concussion using new diagnostic measurements. Carolyn Emery and Willem Meeuwisse are co-leading the study which will start later this year.

Emery, a PhD researcher and co-chair of the Sport Injury Prevention Research Centre in the faculty of Kinesiology at the University of Calgary has produced a landmark study on the implications of body checking and risks for concussions in youth ice hockey. This study has now inspired more research into examining concussion injuries amongst youth and how their recovery takes place.

Debert says one of the goals of the study is to be able to develop a predictable model for recovery. “We will be doing baseline assessments on approximately 1,000 pee-wee hockey players. We will then follow them over a five-year period.

This is the first prospective study of its kind involving the pediatric population,” says Debert. “We know that in the youth hockey population we are studying, approximately 17 per cent will sustain a concussion annually.”

The study will track each time a player has a concussion and it will include a follow-up assessment within 72 hours. These assessments will include cognitive tests, physical examinations, blood work as well as a robotic assessment to measure neurocognitive and sensorimotor impairment following the injury. The researchers will be partnering with Hockey Calgary to schedule the team assessments.

Dr. Debert will also look at neuroendocrine dysfunction and biomarkers following a concussion injury. “We will be looking for any indications of dysfunction immediately following the concussion. We will also assess neuroendocrine dysfunction at three months, six months and one year after the injury. We are trying to determine the incidence of neuroendocrine dysfunction following youth concussion, what and when endocrine abnormalities occur and how it affects their recovery,” she says.

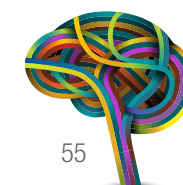
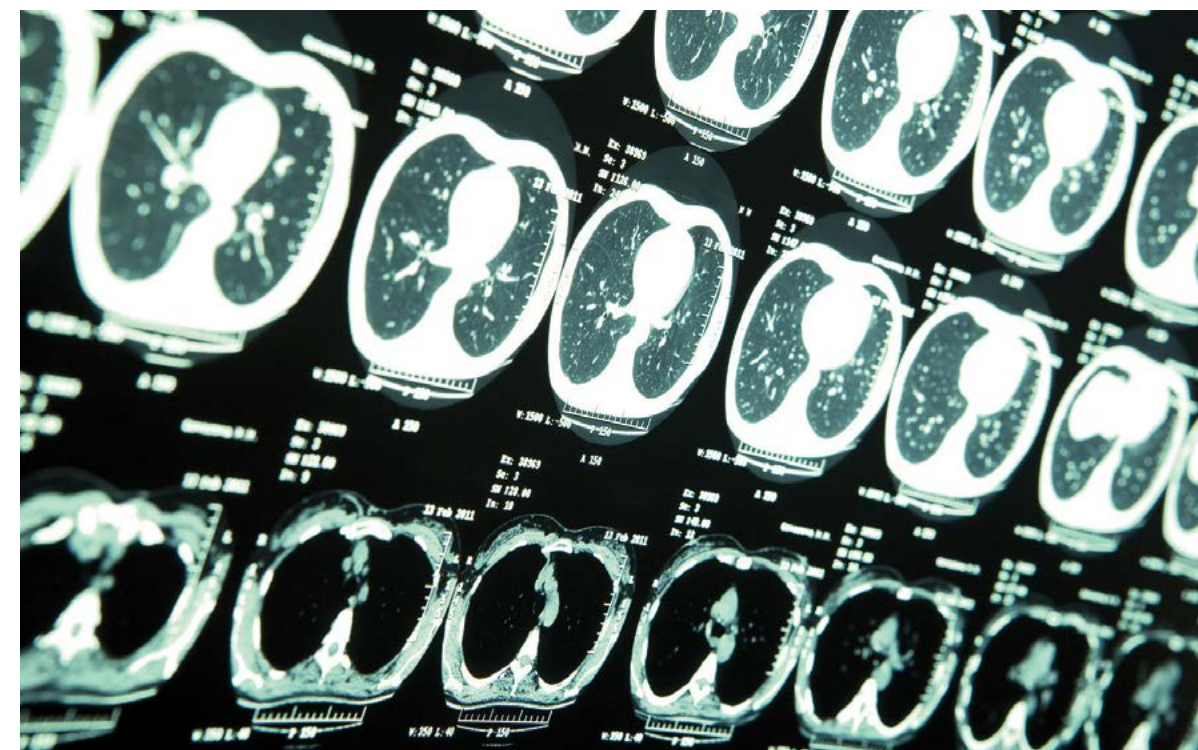
Following a concussion injury, co-investigator, Dr. Sean Dukelow will measure the participants’ neurocognitive deficits and motor impairments using robotics. The participants will complete specific robotic tasks that analyze outcomes such as reaction times and accuracy. This information is then linked to a computer that can run and analyze the data as well as, store the data collected.



Dr. Chantel Debert

Dr. Debert says one of the challenges in measuring the youth population is taking into account normal growth development and changes while assessing dysfunction following concussion.

The study will help to determine what factors influence recovery following concussion in the youth population and what outcomes measures are useful in developing a prediction model that will guide future treatments.



New Robotics Technology

...is Helping Patients Recover after Experiencing a Stroke

Dr. Sean Dukelow

As the Canadian population ages, more Canadians will be facing a long road of recovery after experiencing a stroke. Dr. Sean Dukelow, assistant professor of Physical Medicine and Rehabilitation is discovering new methods of rehabilitation for stroke survivors. In his research, funded by The Heart and Stroke Foundation, Dr. Dukelow is developing robotic assessment tools to check sensory and motor dysfunction after stroke.

After seeing both friends and family affected by stroke, Dr. Dukelow wanted to help people recover faster. “Without research, we don’t have the treatments people need to get better after stroke”, he says. His research was featured as part of the Heart and Stroke Foundation’s Stroke Report 2013: There is life after Stroke. The main focus of his research involves understanding the mechanisms of stroke recovery and facilitating stroke rehabilitation through the use of technology. Previous assessments of stroke patients were mainly observation-based.

In Dr. Dukelow’s lab, a large robotic chair is used to measure a patient’s sensory and motor improvement over time and it helps to deliver therapy. He says the robotic assessment helps to more accurately and objectively measure how a patient is doing after experiencing a stroke. Once the patient has been assessed, the robot can also assist in developing an effective rehabilitation plan.

“It can require tens of thousands of repetitions of a particular movement to relearn how to move after stroke and the robot helps determine the type and intensity of the rehabilitation needed,” says Dukelow. “What I tell my patients is, that there is life after stroke and recovery is a journey, it requires rehabilitation and hard work to get better but inevitably most people do get better,” he says.



Recent statistics released by The Heart and Stroke Foundation also indicate fewer Canadians understand what’s involved in recovering from a stroke. While half of all Canadians have a close friend or family member who has had a stroke, many don’t realize how long the recovery process can take. Less than one half of people, according to the poll, are aware that most strokes can be prevented.

The risk factors associated with a stroke include; high blood pressure, high cholesterol, atrial fibrillation, diabetes, being overweight, excessive alcohol consumption, physical inactivity, smoking and stress. The role of family and caregivers is also critical to helping stroke survivors and loved ones recover after a stroke. Family and caregivers can help survivors: relearn routine activities, regain abilities and cope with everyday challenges.

Facts on Strokes:

- **50,000 strokes occur in Canada each year – one every 10 minutes**
- **315,000 Canadians are living with the effects of stroke**
- **60 per cent of people who have a stroke report that they need help afterwards**
- **Stroke is a leading cause of death and disability among adults**

Facts provided by:

The Heart and Stroke Foundation:
www.heartandstroke.com

Physiatrist Dr. Gillian Simonett Joins DCNS



“What is most important to me is always what is most important to my patients. Goals can change but for me, the key is to always keep the focus on what is best for the patient. The rehabilitation journey itself is exciting, especially finding new ways to improve an individual’s overall quality of life,” says Dr. Simonett.

Imparting some words of wisdom to other new physiatrists, Dr. Simonett says it is best for new residents to get a broad base of knowledge and to get experience in all areas of psychiatry. “First you need a good understanding of what you would like to focus on and then you begin to see the important relationships to other areas of the neurosciences. It’s once you begin to see these other relationships, you begin to realize that’s where the magic lies,” she says.

In the future, Dr. Simonett is interested in expanding her research and clinical experience. She says, “It’s in the clinical aspect of the work where the research questions develop. The interplay between the clinical work and research is very interesting and that’s where I am hoping to gain some knowledge and experience.”

“The set-up here for support in research and education was very appealing to me as someone who is still in the early stages of my career.”

Bravely facing snowstorms upon her arrival in Calgary, Dr. Simonett is looking forward to enjoying the outdoors and doing some exploring along with her young family. “Travelling has always been an interest of mine too, so I hope to enjoy more of that in the years to come as well.”

Dr. Gillian Simonett is a new physiatrist in the division of Physical Medicine and Rehabilitation at DCNS. Originally from Vancouver, Dr. Simonett completed her residency in Physical Medicine and Rehabilitation at The University of British Columbia. During her residency, Dr. Simonett also completed a Masters Degree in Health Sciences with a focus on clinical epidemiology. Her main research interest is in spinal cord injury related pain.

Dr. Simonett says it was the research focus at DCNS that piqued her interest in making the move east to Calgary. “The set-up here for support in research and education was very appealing to me as someone who is still in the early stages of my career.” She says it’s the patients who inspire her to do the work she does every day and she enjoys the process of getting to know them on a personal level.

Physical Medicine and Rehabilitation Welcomes Dr. Gentson Leung

The Division of Physical Medicine and Rehabilitation (PM&R) welcomed Dr. Gentson Leung in August this year. He completed his undergraduate studies at The University of British Columbia (UBC) in biochemistry, and then went onto medical school also at UBC. He completed his residency training in PM&R at The University of Calgary.

Dr. Leung says one of the main reasons he decided to join DCNS was because of the excellent training he received from the psychiatry staff. “I valued the opportunity to work with them. A large part of my character as a physician has been shaped by those around me and the physiatrists in Calgary are a great group to work with.”

He says he also chose DCNS because “there is a unique opportunity to fill a clinical need, both in stroke rehabilitation and amputee rehabilitation.”

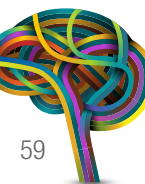
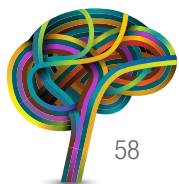
In terms of his clinical work, Dr. Leung will be partnering with the physiatrists already established to help support and build up the existing rehabilitation programs. His main clinical role will be at the

“A large part of my character as a physician has been shaped by those around me and the physiatrists in Calgary are a great group to work with.”



Vernon Fanning Centre managing stroke inpatients and outpatients. In the area of amputee rehabilitation, he will also be partnering with Dr. Ken Lam to provide clinical support and program development.

Dr. Leung says he is also looking forward to being involved in the residency program for PM&R. In terms of his research, he will be partnering with other clinicians involved in stroke rehabilitation at the Vernon Fanning Centre including: Drs. Duke-low, McNeil, and Lam. Dr. Leung says he is inspired to work in the area of psychiatry because he says, “it is ultimately about maximizing the function of our patients; helping them to be able to have the best quality of life and greatest independence possible given their specific health conditions.”



Accomplishments

Farewell to Dr. John Latter

While Dr. John Latter, professor emeritus in the division of Physical Medicine and Rehabilitation (PM&R), says he has mixed feelings as he moves into retirement, he also has many accomplishments to be proud of. “I have always felt that I am an exceedingly lucky gentleman. I get to come to work and play with kids and also be involved in the medical education of undergraduates and residents,” says Dr. Latter.

Dr. Latter has been with The Department of Clinical Neurosciences for 11 years. He was the Division Head of Physical Medicine and Rehabilitation from 2002 to 2009. In addition to this, he founded the residency training program for the division in 2004. “The program had its first graduates in 2009 and we now have a very active residency training program,” he says proudly.

In 2009, he received the Professional Association of Resident’s Physicians (PARA) well-being award. Well-being is an important issue to resident physicians and it’s one of PARA’s primary focuses. It recognizes outstanding contributions made in this area by a physician. Dr. Latter was nominated for this award by his resident colleagues. He also attributes much of his success over the years to all the support he received from his colleagues. “Nothing happens without a lot of team support and for that, I am very thankful,” he says.

Dr. Latter was also a recipient of the Canadian Association of Physical Medicine and Rehabilitation Award of Merit in 2009. The award is given to a member of the Canadian Association of Physical Medicine and Rehabilitation (CAPMR). It recognizes those who have made a contribution to the field of physiatry through: research, education, advocacy, medical care, humanitarianism and mentorship.



He is also very thankful for the collaborative focus at DCNS. “Our resident program has benefited a lot by the access we have had to a team of nationally and internationally recognized neurologists and neurosurgeons.”

Reflecting on the past 11 years, he says the interdisciplinary approach to patient care has worked very well at The Alberta Children’s Hospital. “For the children with complex-care needs, it’s always important for them to have access to the specialists they need at integrated clinics, whether that’s a neurologist, physiatrist or another specialized therapist.”

As far as the future goes, Dr. Latter and his wife are looking forward to a well-deserved cruise on the Baltic Sea in September and a future trip to Hawaii in November. We wish them happy and safe travels ahead.

Amputee Rehabilitation Program

Director: Dr. Kenneth Lam

Overview

The Amputee Rehabilitation Program provides comprehensive care to patients with limb loss across the continuum of care. Both inpatient and outpatient services are provided. In 2012, over 100 new patients with limb loss entered into the program. Amputation occurs at all hospital sites so peri-amputation consultative services are provided city-wide. One of the key components of this program is to optimize the timing and level of amputation by close partnership with our surgical colleagues.

Highlights

The Amputee program is actively involved in limb loss prevention by partnering with multiple stakeholders including the Diabetes SCN and the Sheldon Chumir Wound Care Clinic. By centralizing the outpatient amputee program at one site, we have garnered expertise in managing complex amputees. Those with hemi-pelvectomies receive and the latest prosthetic components like microprocessor knee and new socket designs. A team of 22 health care providers from Calgary visited Haiti last year. Each team member carried two full duffel bags of prosthetic components that were donated by Calgary’s prosthetist. This was very well received by Haiti’s amputee rehabilitation team.

Education

The program is dedicated to medical education and training. Physiatry residents complete a mandatory three month period in the program during their residency. The program is also involved in the education and certification of prosthetists in training. In-service lectures are also delivered to allied health and nursing staff on a regular basis.

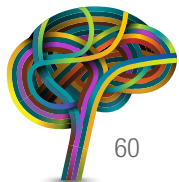


Research

Our resident Dr. Les Laplante is researching perceived need for a community-based exercise program for lower limb amputees.

Members

Dr. Kenneth Kui Sai Lam



Brain Injury Rehabilitation Program

Director: Dr. Christine McGovern

Overview

The Brain Injury Rehabilitation Program is an inpatient and outpatient adult rehabilitation program based at The Foothills Hospital (FMC). The program addresses the needs of individuals with acquired brain injuries which may arise from: trauma, infection, aneurysm rupture, hypoxia, hydrocephalus, or other various causes. The affected individuals have a wide spectrum of severity of injury from mild to severe.

Highlights

- New physiatrist, Dr. Chantel Debert joined the program this year. She will bring a research focus to the program and she will also take a role in clinical care. Dr. Jeremy Quickfall of psychiatry has also joined the clinic to help provide expertise in the management of some of the complex brain injury patients.
- Accreditation Canada visited our site as part of a review of acquired brain injury services across Alberta Health Services (AHS) in October of 2012. Accreditation for the province was received and the Calgary Brain Injury Strategy was favorably referenced in the report.
- The Third Annual Calgary Brain Injury Strategy Event was held in November last year. Close to 150 stakeholders established a direction for the next year. In February, a concussion summit involved stakeholders from family medicine, emergency, urgent care, sports medicine, neurology, and psychiatry to review the current state of knowledge and to address education and resources.

Education

The program has a website with educational information and links to resources at www.albertahealthservices.ca/cbi.asp. All the individuals associated with the program participate in teaching. This includes teaching: medical students, residents, nurses, therapists, social workers

and psychologists. Lectures given this year include: neurology headache grand rounds, emergency grand rounds, physiatry grand rounds, psychiatry grand rounds, an annual update on medicine for psychiatrists and an ICU nurse education day.

A work-shop entitled, *Designing a Brain Injury Strategy – When Patients, Family and Front-line Staff Lead the Way* was presented at the Toronto Acquired Brain Injury Network conference in November of 2012. A talk entitled, *Creating a Culture of Change: A Strategy for Improving Health Care* was delivered at the Canadian Association of Neuroscience Nurses Annual Conference last June.

Research

Funding has been obtained for a project entitled *Quantitative Assessment and Validation of Sensorimotor Dysfunction and Recovery using Robotics in Athletes sustaining an Acute Sport-Related Concussion*. Drs. Chantel Debert and Sean Dukelow are co-investigators on this grant.

Members

Manager:
Jason Knox and Paul Wright
Program coordinators: Lynnette Fritzke and Lisa Patel
Inpatient brain injury coordinator: Jill Congram
Case coordinator: Heather Gillett
Physiatrists: Christine McGovern, Rodney Li Pi Shan, Chantel Debert
Neurologist: Jephtha Davenport
Psychiatrist: Dr. Jeremy Quickfall
Social workers: Carol Lawson and Valerie Bunz
Neuropsychologists: Stewart Longman and Amy Siegenthaler
Brain injury clinic secretary: Susan Morson
Brain injury program secretary: Kendra Ness

The Burn Rehabilitation Program

Director: Dr. Vincent Gabriel

Overview

The Burn Rehabilitation Program at Foothills Medical Centre is part of the Calgary Firefighters Burn Treatment Centre. The program is made up of an inter-disciplinary team that provides comprehensive clinical burn care from the time of acute injury through to community reintegration. Team members participate in clinical and translational research related to burn injury, skin grafting surgery and human scarring.

Highlights

In 2012, our team received three years of research funding from Alberta Innovates Health Solutions (AIHS) to continue our multidisciplinary research program focusing on cell based therapies to improve outcomes following split thickness skin grafting surgery.

Education

Post graduate residents and medical students participated in both inpatient and outpatient clinical settings. Our research team included two external summer students this year. Our master's student, Registered Nurse Lindsay Burnett, successfully defended her thesis in June 2013. We are actively recruiting for additional graduate students, post doctoral fellows and residents whom may be interested in participating in the University of Calgary's Clinical Investigator Program.

Research

Our research activities continue to expand. Our AIHS funded project includes aspects of cell biology, biomedical engineering, psychosocial outcomes and translation of science. Additionally, we have ongoing work in the development of new surgical devices.



Members

Medical:

Dr. Vincent Gabriel (Rehabilitation Medicine),
Dr. Duncan Nickerson (Plastic Surgery)

Research:

Dr. Jeff Biernaskie, PhD

Psychology:

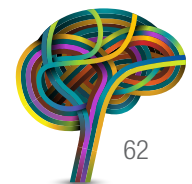
Jenny Horch, PhD

Therapists:

Abby McLeod, PT, Chris Burnie, PT,
Sasha Kurilsky, OT, Joanne Cheal, OT,
Sametta Cole, OT

Support:

Outpatient clinic: Nuha Shubeita-Haddad
Research coordinator: Supriya Save



PM&R Musculoskeletal and Chronic Pain Programs

Director: Dr. Noorshina Virani



Highlights

In 2012, the PM&R MSK program launched the Performing Arts Medicine (PAM) Program within Calgary. Key partnerships were established with the Alberta Ballet and a clinical/research Injury Tracking Screening Program was established this year.

To meet the growing needs of lengthy spine surgery waitlists in the Calgary Zone, the MSK program in collaboration with the south primary care network has established the spine pain initiative. Presently, approximately 15 per cent of spine surgery referrals require surgery leaving the vast majority in need of conservative means of rehabilitation. It is our hope that through this collaboration, knowledge translation will help to reduce the need for unnecessary diagnostic imaging and surgical referral, and thereby connect patients with more appropriate community resources.

Overview

The PM&R Musculoskeletal (MSK) program brings together physiatrists with an interest in musculoskeletal rehabilitation medicine to promote education, research and best practices for clinical care of patients with MSK rehabilitation needs. The program provides expertise in: chronic pain management, interventional pain management with the use of fluoroscopic guided procedures, sports-specific rehabilitation and community MSK consultation.

Our vision is to create an interdisciplinary musculoskeletal program to provide timely access and care to patients with musculoskeletal rehabilitation needs, while fostering the academic development of MSK medicine in Calgary. MSK physiatrists currently receive referrals from throughout Alberta, parts of Saskatchewan and British Columbia.

Education

Several members of the MSK program have contributed to undergraduate Course 2 Medical School teaching, postgraduate resident education through academic half day, residency training committee representation, and clinical rotations in outpatient clinical settings, including private practice and the Alberta Health Services Chronic Pain Centre (AHS CPC). In addition, members have contributed to teaching physicians and allied health in musculoskeletal realms at local, provincial and national levels. This includes the first National Ultrasound Review course, led by physiatry, which was held in Calgary in 2012 under the direction of Dr. Rodney Li Pi Shan.

A significant educational component of chronic pain management is physiatry directed. This includes monthly neuromusculoskeletal interest group meetings, and quarterly symposia open to practitioners throughout the city. Physiatrists at the AHS CPC are also involved in course education for family medicine physicians.

Members

AHS Chronic Pain Centre (AHS CPC):

Pamela Barton,
Co-director of CPC quarterly symposia
Nwamara Dike
Noorshina Virani,
Neuromusculoskeletal Team Lead

Performing arts Medicine (PAM):

Arun Gupta
Chester Ho
Noorshina Virani
Terry Clark, PhD
Brian Benson

Community Practitioners:

Tony Giantomaso
Arun Gupta
David Flaschner
Maryana Apel
Daniel LeBlond

Pediatric and Young Adult Rehabilitation Medicine Program

Director: Dr. Lee Burkholder

Overview

The program provides inpatient and outpatient rehabilitation medicine services to various pediatric patient populations including children with brain injury, cerebral palsy, myelomeningocele/spinal cord injury, neuromuscular conditions, and limb deficiency at the Alberta Children's Hospital (ACH). The program is also responsible for the young adult rehabilitation clinic, an outpatient clinic located at the Foothills Medical Centre (FMC) dedicated to adult patients with child-onset neurological conditions. The clinic assists patients transitioning from pediatric care to the adult world.

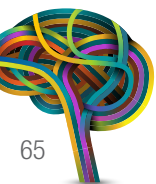
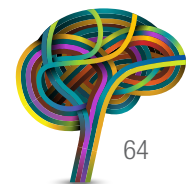
Highlights

Program members were invited to the ACH Rehabilitation Working Group, which was a significant contributor to an \$18.3 million proposal to establish a world-class Pain and Rehabilitation Program at the Alberta Children's Hospital. In March 2013,

the Riddell Family and the ACH Foundation announced a \$15 million donation to establish the Vi Riddell Pain and Rehabilitation Centre. Program members continue to meet regularly with the rehabilitation medical and operations directors to aid with implementation of services and associated research projects.

The program welcomed Dr. Vithya Gnanakumar to the ACH in October of 2012 to further support existing clinical programs including the Dr. Gordon Townsend rehabilitation and education programs. This further develops rehabilitation initiatives such as the general rehabilitation medicine clinic and it expands our research activities.

Dr. John Latter received multiple awards this past year. He was recognized as a Professor Emeritus by DCNS and pediatrics last April. He also received a teaching award from the 2014 University of Calgary



undergraduate medical class in March. A research project completed by Dr. Jordan Raugust, PM&R resident, and Dr. Latter titled *Concussion in Pediatric Ice Hockey Players: Description of Characteristics Based on a Previous History of a Concussion or Mild Traumatic Brain Injury* was awarded second prize for poster presentation at the Canadian Association of Physical Medicine and Rehabilitation 61st Annual Scientific meeting. Another research project again authored by Dr. Raugust and Dr. Latter titled *Does Diagnostic Terminology Affect Parents' Perception of Concussion or Mild Traumatic Brain Injury Severity?* was awarded the DCNS J. Gregory Cairncross Award for Excellence in resident clinical research in December 2012.

Education

Educational pursuits were largely related to medical trainee and patient education. The program hosted medical post-graduate trainees in: physical medicine and rehabilitation, pediatric neurology, general pediatric and developmental pediatric residents as well as a fellow in pediatric rehabilitation medicine on service for 11 of 13 academic blocks.

Dr. Lee Burkholder was invited to speak on the topic of health care transitions at the 2012 Youth In Action conference hosted by Muscular Dystrophy Canada for young persons with neuromuscular disorders. Dr. Burkholder was also invited to speak in an educational video, created through the ACH Family and Community Resource Centre, for patients and families on family centered care.

Research

Dr. Latter is a clinical collaborator for various research studies examining pediatric brain injury and concussion including the research program *Safe to Play: A longitudinal research program to establish best practice in the prevention, early diagnosis and management of sport-related concussion in youth ice hockey players*.

Members

Dr. Lee Burkholder, Dr. John Latter, Dr. Vithya Gnanakumar



Paraplegic Foundation in order to promote interdisciplinary clinical research development within the SCI rehabilitation program. This has been very successful and within one year, it has led to research education training, international presentations and research grant submissions developed by the interdisciplinary team.

Education

- We re-designed the SCI education program to facilitate learning and participation by patients.
- The sexuality and disability workshops were led by Dr. Stacy Elliott and Marie Carlson.
- SCI Research 101 and 201 workshops were also held over the last year.

Research

- We participated in the national SCI Knowledge Mobilization Network (KMN) for the implementation of best practice in the prevention of pressure ulcers.
- We developed the SCI Nurse Champion project to study the patient care impact following the implementation of Nurse Champions for SCI.
- We completed the SCI Telehealth and pressure ulcer management study and the SCI Care and Needs survey for persons with SCI in Southern Alberta.

Members

Denise Hill, MD, FRCP(C), Chester Ho, MD, Dan McGowan, MD, FRCP(C), Gillian Simonett, MD, FRCP(C)

- Recruitment of new SCI physiatrist Dr. Gillian Simonett – Dr. Simonett was a graduate of the PM&R program at the University of British Columbia. Prior to joining the University of Calgary in April, she was a staff physiatrist at the GF Strong Rehabilitation Centre in Vancouver.

The Spinal Cord Injury Rehabilitation Program

Director: Dr. Chester Ho

Overview

The Spinal Cord Injury (SCI) Rehabilitation Program provides inpatient and outpatient rehabilitation services to persons with traumatic and non-traumatic SCI for southern Alberta, eastern British Columbia and western Saskatchewan.

Highlights

- Strategic development of spinal cord injury (SCI) rehabilitation program – the SCI rehabilitation program has undergone substantial development

over the last year. We hosted the first retreat jointly with the Spine Surgery program, and we developed of the Calgary Zone SCI advisory committee, bringing together stakeholders across the continuum of care, with the goal to review and re-design SCI service delivery from acute care to community reintegration. Our ultimate goal is to provide better care to people with SCI.

- Creation of SCI research facilitator position – this position was funded through the Alberta



The Stroke Rehabilitation Program

Director: Dr. Sean Dukelow

Overview

Physiatry provides support for inpatient stroke rehabilitation services at both the Foothills Medical Centre and the Dr. Vernon Fanning Care Centre. Our physiatry group also supports outpatient stroke rehabilitation in the community through Community Accessible Rehabilitation, Early Supported Discharge and other private rehabilitation facilities. We accept referrals from across southern Alberta for patients who require stroke rehabilitation expertise.

Highlights

Clinical highlights involved two separate functional electrical stimulation workshops, coordinated by Dr. Lam and a team of therapists from across the Calgary zone. These workshops were targeted at integrating functional electrical stimulation into daily rehabilitation practice to promote stroke recovery.

Education

Several physiatry residents, neurology residents and medical students spent time learning about stroke rehabilitation in our clinics, on the ward and in classroom teaching sessions.

Research

The Stroke Rehabilitation Program received peer-reviewed funding for two new projects. Using robotics, the RESTORE study will examine early upper limb rehabilitation. The project was funded by the Heart and Stroke Foundation of Canada. The DOSE study, funded by the Centre for Stroke Recovery, will examine the effect of early, intense lower extremity rehabilitation.



We also began participation as a site in the Heart and Stroke Foundation of Ontario funded multi-centre EVREST trial examining the efficacy of virtual rehabilitation using the Nintendo Wii for the upper extremity. Recruitment in the Canadian Institutes of Health Research (CIHR) and the Heart and Stroke Foundation of Canada (HSFC) funded RESTART. This study focuses on the robotic assessment of stroke-related deficits. It continued throughout the year with multiple presentations at national and international conferences.

Participation in the TOWER study began and SPACE study continued, with both studies sponsored by Merz investigating the effects of botulinum toxin on spasticity.

Members

Sean Dukelow, Ken Lam, Steve McNeil



General Physical Medicine and Rehabilitation

Overview

General physical medicine and rehabilitation patients are seen in the outpatient physiatry clinic areas on the main floor special services building of the Foothills Hospital. Various physiatrists provide consultation and physician follow up services to these patients. The types of patients seen may include: adults with non-surgical rehabilitation needs secondary to inflammatory and degenerative arthritis, scoliosis, myofascial pain, spine and peripheral joint pain, orthopedic trauma, tendinopathy, metabolic bone disease, neuromuscular disease, cerebral palsy, neurological and musculoskeletal complications of HIV or cancer and some movement disorders.

Inpatient general physiatry consultation is provided weekly at Rockyview, Glenmore, and Peter Lougheed Hospitals and it is led by Dr. Nwamara Dike. This includes a majority of neurological diagnoses and a limited number of musculoskeletal inpatient diagnoses.

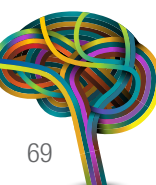
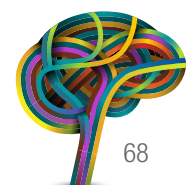
Highlights

This year three physiatrists have started to provide outpatient consultation service to the subspecialty

neuromuscular, amyotrophic lateral sclerosis, and multiple sclerosis multidisciplinary clinics at the South Health Campus.

From June 2012 to May 2013, a total of 202 new general physiatry outpatients and 700 repeat visits occurred in the physiatry clinic area. This is a large increase in volume as compared to last year of 159 new and 458 repeat visits. For the period January to December of 2012, there were a total of 106 inpatient general PM&R and neurological consultations from all three acute care sites including Glenmore Rehabilitation.

Some of the physiatrists in the general physiatry clinics are currently developing ultrasound expertise for visualization of nerve and musculoskeletal structures, and for guided injections. This innovative technology is rapidly moving to the forefront in physiatry education and clinical practice, especially in the areas of musculoskeletal medicine, neuromuscular disease and spasticity management.



The Division of Experimental Neurosciences

Division Head, Dr. Bin Hu



Overview

Established in 2007, the Division of Experimental Neuroscience (DEN) in the Department of Clinical Neurosciences (DCNS) currently consists of five primary and five secondary members. Research areas span from neurodegenerative diseases and movement disorders, to multiple sclerosis and the development of specialized medical device development. Almost all members within DEN maintain meaningful and productive collaborations with clinicians or clinician scientists within the DCNS, in addition to our partners in the Hotchkiss Brain Institute (HBI), the University of Calgary and Alberta Health Services. The current active members of DEN include:

- Dr. Wee V. Yong is a professor at the Hotchkiss Brain Institute and the Departments of Clinical Neurosciences and Oncology. He co-directs the Multiple Sclerosis Program of the Hotchkiss Brain Institute and he holds the Canada Research Chair in neuroimmunology. Dr. Yong's research

interests lie in the area of neuroimmunology, neuroprotection and CNS regeneration. His projects have been guided by MS, spinal cord injury and malignant gliomas. His research has been supported by Canadian Institutes for Health Research (CIHR), the Multiple Sclerosis Society of Canada, and Alberta Innovates - Health Solutions and the Alberta Cancer Foundation.

- Dr. Minh Dang Nguyen is an associate professor and a member of the HBI. The main goal of his research is to understand the basic mechanisms governing brain aging and neurodegenerative disorders. His research has been funded by Alberta Innovates - Health Solutions (AIHS), CIHR, the Human Frontier Science Program Organization, the Brenda Strafford Foundation Chair in Alzheimer research, the Amyotrophic Lateral Sclerosis and the Austrian Academy of Sciences.
- Dr. Shalina Ousman is an assistant professor and a member of the Multiple Sclerosis Program of the Hotchkiss Brain Institute. Her research is focused on investigating the role of alphaB-crys-



Dr. Shalina Ousman

tallin (α BC) in autoimmune function, disease mechanism and regeneration in the context of multiple sclerosis. Her research has been funded by CIHR, Multiple Sclerosis Society of Canada and Canadian Foundation for Innovation.

- Dr. Bin Hu is a professor for Parkinson's disease research and he is a member of the Hotchkiss Brain Institute. He currently directs a basic research laboratory and an experimental therapeutic program for patients living with Parkinson's disease. His scholarly activities and research interests are focused on brain attention networks, especially those related to sensorimotor learning and memory. His research has been supported by CIHR, Parkinson Society Alberta, AIHS and Branch-out Foundation for Neurological Diseases.



Dr. Minh Dang Nguyen

Photo courtesy of Jared Sych

Highlights

- Dr. Yong was elected by an international community to be the vice-president of the International Society of Neuroimmunology; he will become its president in 2014.
- Dr. Minh Dang Nguyen was featured as an Alberta immigrant success story in Alberta Venture Magazine. He was also named by Avenue Magazine as a *Top 40 Under 40* in Calgary.
- Dr. Ousman published a review article in high impact journal Nature Review Neuroscience titled, *Immune surveillance in the central nervous system*.
- Dr. Hu was awarded \$750,000 to start a multi-center study of Ambulosono, Sensorimotor contingency-based music walking program for people living with Parkinson's disease.

Education

DEN members offer graduate studies in both clinical and basic neurosciences, year-round research projects for senior undergraduates and summer research programs. Division members are also active participants in community-oriented educational events.

Research

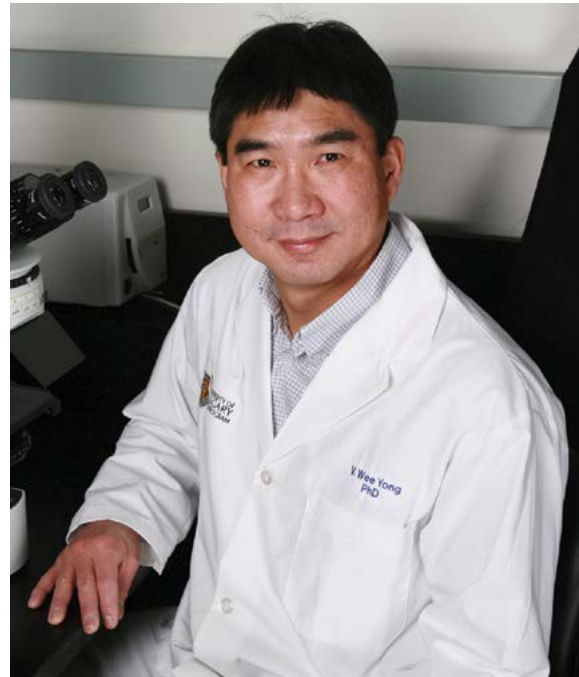
Members from Division of Experimental Neurosciences received more than \$1.6 million in research and grant support for 2012. See the back of this annual report for a detailed publication list.

Future Directions

The Division of Experimental Neuroscience is in a unique position to foster translational neuroscience research. We are somewhat different from the basic science departments, in that, our research has a clear mandate to facilitate and integrate care, research and education and to ensure that discoveries in basic and clinical research can lead to innovative health solutions for Canadians who suffer from neurological and mental disorders.

New Leadership and New Name

Dr. V. Wee Yong is the New Division Head for the Newly Named Translational Neurosciences as Former Head Dr. Bin Hu Steps Down



Dr. V. Wee Yong

In July this year, the Division of Experimental Neurosciences had a change in leadership and name as Dr. Bin Hu, professor and division head of Experimental Neurosciences stepped down and professor, Dr. V. Wee Yong was named as the new head. Dr. V. Wee Yong has renamed the division Translational Neuroscience.

This division fosters neuroscience research and translates it into innovative health solutions. Members within the department collaborate with clinicians and clinical scientists from the department as a whole. Their research spans multiple areas including: neurodegenerative diseases, movement disorders, multiple sclerosis and research into specialized medical device equipment.

Dr. Yong explains the name change by saying, “The division has changed its name to reflect the fact that its primary members all have significant interest in projects that translate basic science findings into eventual clinical applications. The new name also signifies our more forward looking and ambitious program and it invites other members of the department to foster collaborations with the basic science laboratories to expedite discoveries of the treatment of neurological conditions. We also wish to highlight the translational activities of members in other divisions of the DCNS. Finally, we aspire to have clinical trainees take part in basic neuroscience projects, so that the bi-directional learning between clinical and scientific trainees can lead to a new generation of multi-disciplinary researchers.”

Dr. Yong has been a professor with the division for 17 years. He received his Ph.D. from the University of British Columbia and started his faculty appointment at the Montreal Neurological Institute at McGill University in 1989. He relocated to Calgary in 1996. His research interests lie in the areas of: Multiple Sclerosis (MS), spinal cord injury and malignant gliomas. He co-directs the Multiple Sclerosis (MS) Program of the Hotchkiss Brain Institute and he holds the Canada Research Chair in neuroimmunology.

In 2012, Dr. Yong was elected by an international community to be the Vice President of the International Society of Neuroimmunology and he will become their President in 2014. He is the director of the Alberta endMS network which co-ordinates MS training activities.

“I am looking forward to continuing to focus on translational medicine. I consider myself to be a very collaborative individual and this makes sense because many of the funding agencies look for a team approach to research,” says Dr. Yong. The focus for the division, he says, is on research that encompasses the bench to bedside or translational medicine approach. This research starts in a lab setting and results in a direct and positive impact on patient care.

Dr. Yong says some of the future plans for the division include: growing in size, creating new identities as translational researchers and making the residents of the department more aware of what neuroscientists do. In order to achieve this he says, “another priority would be for our division to be better integrated with our clinical programs.” He adds, “I am very proud to be part of a very multi-disciplinary department here at DCNS. Belonging to this department enables us to conduct very important translational medicine research.”

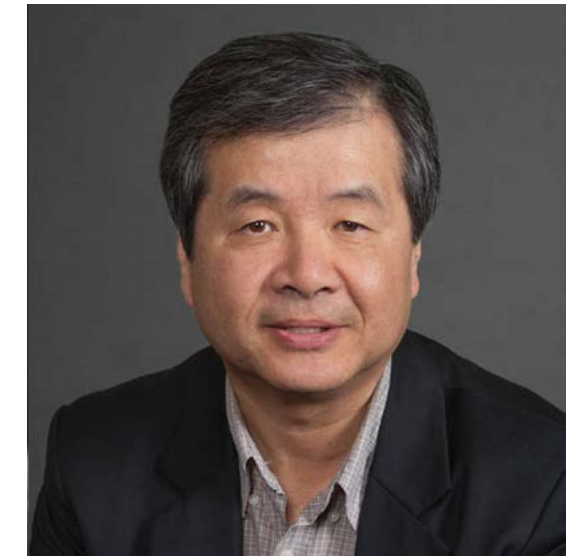
Dr. Yong has published over 200 manuscripts and his work has been cited over 12,000 times. He also currently heads the HBI and DCNS Team Grant Advisory Panel. The panel helps researchers to strive for excellence in neuroscience research by finding ways to improve their competitiveness with team funded grants.

As the previous division head for the last seven years, Dr. Bin Hu says his fondest memory of the department is the calls he has received from his patient’s relatives thanking him for helping those in the experimental therapeutic program for Parkinson’s.

Dr. Hu started the music therapy for Parkinson’s patients in late 2011 when his patients told him their symptoms seem to be alleviated while they were dancing. This led him to research the effect of music therapy on their treatment. The patients responded very favorably to the music and some experienced significantly improved walking speeds. The music walking program is funded by The Canadian Institutes of Health Research (CIHR), Alberta Innovates-Health Solutions (AIHS), The Hotchkiss Brain Institute (HBI) and The Parkinson’s Society of Canada. The research caught the attention of a

broad scientific community and the music walking program has now expanded to six Canadian cities. It has been cited recently by the Parliamentary Committee of the Canadian government as an example of successful translational research.

In explaining his success Dr. Hu says, “Research at DCNS has an unambiguous focus on disease, patient care and outcome measurement. Working in this environment involves fewer roadblocks to conducting translational research and it includes direct access to clinical expertise; all of this shortens the cycle of bringing research into practice.”



Dr. Bin Hu

While he says the division has had some challenges in obtaining research funding, he is proud of the quality of research being conducted. “Our division offers quantitative, insightful, and innovative projects that result in affordable health care solutions.”

Dr. Hu says he would like to see the division expand to involve the four pillars of research which would include: biomedical, clinical, health services as well as, social, cultural, environmental and population health research. For now, he says he’s looking forward to a well-deserved break so he can “spend more time on innovations and having fun.”





Back row left to right:
Dr. Shalina Ousman, Vahid Hoghooghi
Front row left to right:
Que Lan Quach, Erin-Mai Lim, Trisha Finlay

Collaboration

Dr. Shalina Ousman is Taking an Investigative Approach to Research

Dr. Shalina Ousman says it's the investigative nature of her work that inspires her to spend many days in the lab with the hopes of discovering new treatments for multiple sclerosis (MS). "I like working in the unknown and of course the ultimate goal is always to be one of the first to make a major discovery, that's something that drives me," she says.

Dr. Ousman started working for DCNS in 2008. She is an assistant professor in DCNS and cell biology & anatomy at Hotchkiss Brain Institute at The University of Calgary. She has a PhD in Neurosciences from McGill University and completed her post doctoral fellowship training at The Scripps Research Institute and Stanford University. In 2011, Dr. Ousman was selected as a *Top 40 Under 40* by Calgary's Avenue Magazine. She is involved in several volunteer activities as a fundraiser and walker for the MS Society of Canada and she regularly gives lectures on MS to the public.

While most of her research focuses on identifying the protective mechanisms of human cells in MS, one quarter of her research is also devoted to peripheral nerve regeneration. She says she has always been intrigued by MS research and that it's the patient stories that inspire her to pursue further research. "Over the years, I have met patients and even friends who are suddenly faced with an MS diagnosis yet they find a way to keep going on with their lives. They have their bad days for sure but they keep moving forward with a positive attitude," she says.

MS is an autoimmune disease leading to central nervous system (CNS) degeneration in approximately 50,000 to 75,000 Canadians. Current therapies

“Everyone is very collegial. We can't learn everything in our lab so it has been great to work alongside the clinicians, it's very interesting and it creates a positive experience for everyone involved.”

for MS are useful in some patients but they do not prevent progression of the disease and are ineffective in many patients. Dr. Ousman hopes to pursue this need for new therapies.

In collaboration with Dr. Luanne Metz, Dr. Ousman has been working on a pilot study involving a protein called alphaB-crystallin. The protein plays a role in the defense system of animals and it exists in higher levels in MS patients yet it isn't able to fight off the disease. Her research is now focused on determining how increased levels of the protein will react in humans. So far the research seems promising; she has found a subset of MS patients who have responded favorably to the protein.

Ousman says she finds opportunities like these for collaboration at DCNS very helpful. "Everyone is

very collegial. We can't learn everything in our lab so it has been great to work alongside the clinicians, it's very interesting and it creates a positive experience for everyone involved."

Her ongoing studies will look at the molecular features of the patients who responded favorably to alphaB-crystallin. Yet, due to the complicated nature of MS, multiple therapies are typically needed to treat it and as a result, her lab is now also investigating other protective molecules affecting MS patients.

Aside from her busy research activities, Dr. Ousman also finds time to help mentor new research students as well (see Mentoring story this page). "I tell my students that the processes involved in research can be frustrating and rigorous at times but that it's always worth it when you make a real discovery."

Mentoring

A Student Researcher Enjoys Her First Wet-Lab Experience

Erin Mai-Lim is thankful for the opportunity to work with other student researchers. Currently working in Dr. Shalina Ousman's lab she says, "Some days are more stressful than others but in general, it has been a really good experience. We have a small lab and everyone is very helpful, we are actively involved in each other's projects."

Erin-Mai Lim completed an undergraduate science degree at the University of Alberta in Edmonton. During her undergrad program, Erin worked in a few different lab settings before deciding to come to Calgary and DCNS to start research for her PhD.

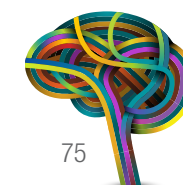
Currently, she is working on peripheral nerve regeneration while the other research students in the lab are focusing on multiple sclerosis research.

"Dr. Ousman is very helpful, I keep her updated on my lab results and we have regular weekly meetings. She is a very good supervisor."



She says it's important for students to get both clinical and basic science experience so they know which direction they want to pursue. Dr. Ousman's lab is her first wet-lab experience. She says she wanted to get further experience in a basic science lab setting because she already had some clinical research experience.

As far as the future goes, Erin says she is not sure if she wants to pursue a basic science path or if she wants to be more involved in the clinical aspects of research. She thinks teaching may be in her future. "I am always very interested in research but I may also be interested in lecturing; it would be fun to prepare notes and help students learn."



Undergraduate Medical Education in Clinical Neurosciences

Co-Chairs: Gary Klein and Darren Burback

Evaluation Co-ordinator: David Patry

Course Co-ordinator: Kelly Hoglund

Overview

Medical students are taught about the neurosciences and aging in the first course of the second year of the undergraduate curriculum during August and September each year. The neurosciences component is combined with content from geriatrics, otolaryngology and ophthalmology. The course, entitled, *Course V – Neurosciences, Aging and Special Senses*, is overseen by the Undergraduate Medical Education office of the Faculty of Medicine at the University of Calgary. The neurosciences content in the course begins with a series of lectures on the functional anatomy and physiology required to evaluate patients presenting with neurological complaints. The remainder of the content covers clinical presentations of neurological illness as well as sessions devoted to specific neurological conditions. The curriculum is taught by approximately 130 teachers including 60 from the Department of Clinical Neurosciences.

Course content is delivered via a combination of lectures, patient presentations, small group seminars and bedside teaching sessions. A group of approximately 15 teachers from the department have taken some further faculty development training and have committed to supervising many of the small group and clinical teaching sessions.

Course V Committee

Paolo Federico, Dan McGowan, Walter Hader, Alice Ho, Lothar Resch, Karen Fruetel, Paula Pearce, Karin Verstraten, Vivian Hill, Paul Marck, Patrick Lee, Kelly Hoglund, Alby Richard, Carolyn Wong-Ranasinghe



Residency Programs Q & A with Drs. Daniel Yavin and Michael Tso 2013 Vanier Graduate Scholarship Recipients

Congratulations to new Vanier Graduate Scholars Michael Tso and Daniel Yavin. Michael and Daniel both started their neurosurgery residency training in Calgary in 2009. The Vanier Graduate Scholarship provides students and researchers from Canada and from around the world studying in Canada, the support they need to conduct world-class research while enhancing Canada's standing as a global centre of excellence in research, innovation and higher learning. Vanier Scholars demonstrate exceptional leadership skills and a high standard of scholarly achievement. Scholarship recipients receive \$50,000 per year for up to three years of research.

What does winning a major award like this mean to you?

D: I am both grateful and honored to have been awarded the Vanier Canada Graduate Scholarship. The support will allow me to pursue my lifelong ambition of becoming an academic neurosurgeon with doctoral training in clinical epidemiology.

M: There are so many brilliant scientists-in-training across the country, that I feel it is truly an honour to



be a recipient of Canada's most prestigious doctoral award. The financial security provided by the Vanier Canada Graduate Scholarship allows me to focus my efforts on conducting research.

As a neurosurgery resident, what is your main area of research?

D: My primary area of research focuses on the operative management of degenerative disease of the spine. Due to aging demography in Canada, the burden of this disease will increase in the coming years. My graduate research will evaluate the role surgery plays in the treatment of degenerative disease of the spine.

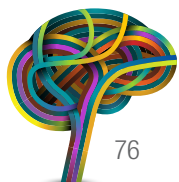
M: My research focuses on subarachnoid hemorrhage, a type of bleeding stroke usually from a ruptured brain aneurysm. This type of stroke can affect healthy people suddenly without warning and can be deadly. Neurosurgeons and neuro-interventional radiologists have become quite good at treating these aneurysms acutely, but some patients are still left with significant brain injury. My research, supervised by Dr. R. Loch Macdonald at the University of Toronto, investigates the mechanisms of this brain injury and looks at new drug treatments to improve outcomes in an animal model of subarachnoid hemorrhage.

What inspires you to do the research you do every day?

D: The greatest inspiration to conduct research comes from the patients whose care I have been fortunate enough to be involved in. In return for this privilege, I believe we are obligated as physicians to contribute to the future improvement of patient care. The hope that my research efforts will one day result



Dr. Daniel Yavin



in a meaningful advance in the treatment of patients with neurologic disease is what motivates me.

M: I have personally been involved in the care of several patients with ruptured brain aneurysms. Some did not survive or suffered severe brain injury despite aggressive life-saving care. These patients are a constant reminder that the current care is not good enough and that new treatments need to be investigated.

What attracted you to the University of Calgary Neurosurgical Residency Training Program in particular?

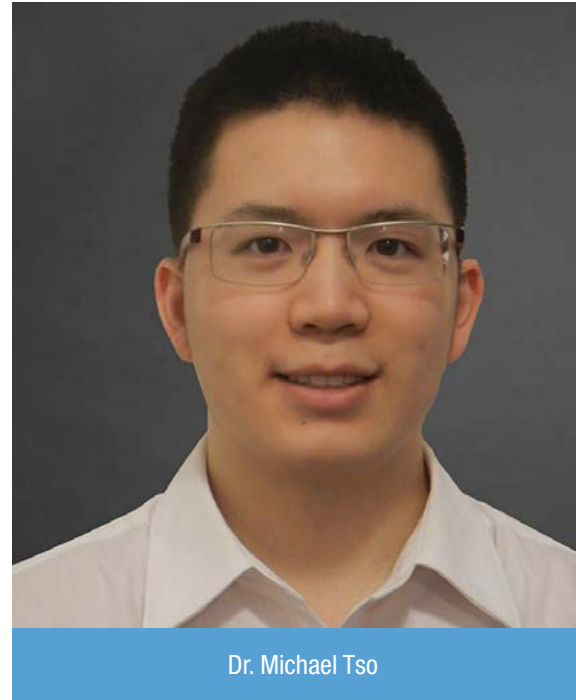
D: A unique culture of innovation attracted me to the University of Calgary. This history of innovation in fields such as intraoperative imaging and surgical robotics made neurosurgical residency training at the University of Calgary an incredible opportunity that could not be found elsewhere in the country.

M: For the last several years, the University of Calgary Neurosurgical Residency Training Program has been developing a national reputation of not only being a top-notch academic program but also a highly collegial one. I was drawn to the Calgary program for its excellent clinical neurosurgical training as well as its emphasis on protected research time.

As part of the scholarship evaluation process, you were evaluated on your leadership potential. What does leadership mean to you?

D: During neurosurgical training, when the hours can be demanding and the cases difficult, the true value of strong leadership becomes apparent. Through the support of mentors in the department of neurosurgery I came to learn that leadership meant the ability to inspire those around you to excel.

M: In broad terms, leadership means knowing the current state of affairs and having a vision of how things should be. In terms of research, that means taking a new idea or approach, testing it thoroughly and collaborating with your peers and colleagues to develop the idea.



Dr. Michael Tso

What do you hope to accomplish with your research?

D: My research focuses on the rationale incorporation of evidence obtained from clinical trials into practice. Through the identifications and promotion of best practices, I hope to achieve a meaningful improvement in operative management of common neurosurgical conditions.

M: In my research, I hope to develop new drug treatments to limit brain injury in animal models of subarachnoid hemorrhage and have these treatments investigated in clinical trials involving patients. By conducting this new research, I hope to provide patients with access to the latest treatment options.

Where do you see yourself after you complete your residency?

D: After my residency and graduate training I plan to pursue a career as an academic spine neurosurgeon. Through the use of objectively evaluated surgical outcomes, I hope to help guide the rationale and cost-effective incorporation of advances in spinal instrumentation into clinical practice.

M: I will be pursuing fellowships in both open cerebrovascular and endovascular neurosurgery. My ultimate career goal is to become an independent investigator and a surgeon-scientist.

Neurosurgery Residency

Program Director: Dr. R. John Hurlbert

Program Administrator: Patti Sullivan

Accreditation: Royal College of Physicians and Surgeons of Canada

Length of Training: 6 years

Number positions per year: 2

Mandatory Research Block: 1 year



Dr. R. John Hurlbert

Overview

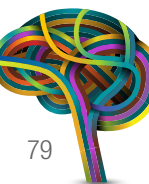
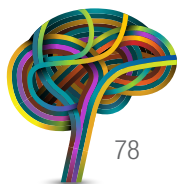
Education of our postgraduate and undergraduate students remains one of the highest priorities of DCNS and the Division of Neurosurgery. The teaching faculty consists of a large complement of dynamic key opinion leaders representing all subspecialties of neurosurgery including vascular, interventional, glioma, skull base, epilepsy, function and peripheral nerve interests. In addition, the University of Calgary boasts the largest comprehensive spinal surgery program in Canada with a total of 11 full-time spine surgeons coming from both neurosurgical and orthopedic backgrounds.

From the moment residents enter the program, they are continuously involved in research and education initiatives. Considerable resources are dedicated each year to facilitating this academic activity through faculty participation, existing peer-reviewed grants, project funding from divisional and department sources and 12 months of mandatory clinical or basic science research. The neurosurgery school runs each week for two hours on Monday afternoons. Sessions are led by the residents and supervised by the faculty, creating a learning environment within the realm of neurosurgical expertise.

A number of our residents have been the recipients of various awards for their outstanding clinical and academic endeavors. Dr. Philippe Mercier was one of this year's recipients of the annual Foothills Hospital Medical Staff Association Doc's Café award

for exceptional leadership during the core training years of residency. He has also been recognized by his peers as the neurosurgical resident teacher of 2012-13. Dr. Michael Tso received the American Academy of Neurological Surgeons, Neurosurgery Research & Educational Fellowship (NREF) Cerebrovascular Section Research Fellowship award, the Bisby Fellowship Award for the top-ranking health professional CIHR fellowship application, as well as being one of the recipients of a Vanier Graduate Scholarship. Dr. Daniel Yavin was also a recipient of the Vanier Graduate Scholarship in addition to being recognized as the October 2012 Resident of the Month by the Professional Association of Resident Physicians of Alberta (PARA). Dr. Andrew Ryu was selected by the attending teaching faculty for this year's resident clinical research presentation award at the annual Alberta Neurosurgical Society meeting.

Team relationships outside the hospital are of equal importance to the Division of Neurosurgery as they are within the hospital. The program offers a well-rounded exposure to all aspects of neurosurgery within a close and collegial environment. Non work-related, team building events held throughout the year provide a health balance against a busy lifestyle choice. The end result is a recipe for one of the most cohesive, dedicated, and high-performing resident groups in all of Canada and a group that we are proud to call our own.



Neurology Residency Program

Program Director: Dr. Michael Yeung

Program Administrator: Elizabeth Martens

Number of positions per year: 3

Accreditation: Royal College of Physicians and Surgeons of Canada

Length of Training: 5 years

Mandatory Research Block: 3-6 months



Dr. Michael Yeung

The Neurology Residency Program prepares residents to become specialists in neurology during a five-year period of study which includes supervised clinical and research experience and an academic program. The academic program is comprised of an academic half-day held weekly and daily educational rounds. In addition, there are regular seminars on ethics, communication skills and evidence-based medicine.

An evaluation of the residents and the program occur on a regular basis. The program director and residency program committee manage all aspects of the program with the help of a program administrator. All members of the Division of Neurology participate in resident education. The neurology program has trained over 30 neurologists since its inception in 1981.

Physical Medicine and Rehabilitation (PM&R) Residency Program

Program Director: Dr. Stephanie Plamondon

Program Administrator: Linda Jennett

Number of positions per year: 2

Accreditation: Royal College of Physicians and Surgeons of Canada

Length of Training: 5 years



Dr. Stephanie Plamondon

Overview

The Division of PM&R provides teaching for undergraduates and post-graduates. Within the last academic year, the division supported 11 post-graduate residents in its Royal College accredited PM&R training program. In addition, there were nine off service and visiting residents for a total of 11 rehabilitation block rotations for neurology, pediatric neurology, pediatrics and community medicine. Our staff provided a four-week observership to a visiting Korean resident in training.

There were 20 formal electives for medical students, several Meds 440 courses and approximately 10 or more shadowing students. The demand for physiatry electives and shadowing opportunities has been growing rapidly over the last two years and is keeping pace with the division's staff growth. The Division of PM&R provides support to the medical school in its teaching for small groups, lectures, and clinical skills.

The senior physiatry resident clinic occurs one half day per week and provides service to general physiatry patients. Two PM&R residents provide outpatient consultation and follow up in this longitudinal clinic while they are supervised by a staff physiatrist throughout their final year of training. This final year of training allows for further: outpatient clinic exposure, experience in continuity of care, development of managerial and time management skills, examination preparation, teaching opportunities and exposure to varied clinical diagnoses.

Since our residency training program's inception in 2004, all of our nine graduating University of Calgary PM&R residents have successfully passed both their Royal College certification examinations and their EMG certification exams with a 100 per cent pass rate. They have also all successfully started their careers in either tertiary centers or mid-size community-based practices. Our residents take a variety of career paths with some choosing to work in a full-time clinical practice or others may choose; subspecialty fellowship training, research and clinical training or teaching careers.

Fellowships in Clinical Neurosciences

Overview

The Department of Clinical Neurosciences (DCNS) at the University of Calgary offers one and two year basic and clinical research fellowships designed to provide enhanced broad-based clinical training and responsibility beyond the certification level, as well as clinical research opportunities. DCNS has an average of 30 fellows each year studying in a variety of specialties.

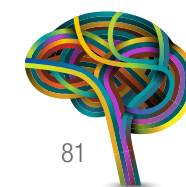
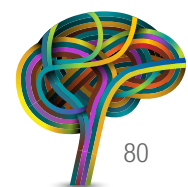
Individual fellows work on specific projects targeted to clinical neurosciences problems in a variety of areas including:

- Stroke
- Spinal Neurosurgery
- Peripheral Nerve
- Functional Neurosurgery
- Stereotactic Radiosurgery
- Neuro-oncology
- Endovascular Neurosurgery
- Epilepsy
- Headache
- Multiple Sclerosis
- Neuromuscular



Within the University of Calgary and Alberta Health Services, the structure of DCNS is uniquely suited to advancing research from the laboratory directly to the patient's bedside. The department has been fortunate to be able to attract fellows from a wide variety of backgrounds seeking further subspecialty experience. Their presence has enriched the clinical and academic environment for all.

For more information on fellowship opportunities, please contact us at dcnsinfo@ucalgary.ca.



Research in Clinical Neurosciences

Overview

The Department of Clinical Neurosciences (DCNS) was founded over 30 years ago on the premise that excellence in patient care and excellence in research go hand in hand. We see them not only as inseparable, but synergistic. Many of the physicians and surgeons in Clinical Neurosciences are actively engaged in research however, some focus exclusively in patient care. The spirit of research and innovation are integral to our team and continuously fostered. Members of our department lead a variety of research programs and our research is facilitated by strong partnerships with: the Hotchkiss Brain Institute (HBI), clinical departments within the Calgary Zone of Alberta Health Services as well as, other public and private organizations. Our members, research efforts focus on the following areas:

- Basic Research - the study of biology and mechanisms of disease.
- Translational Research– which involves taking findings from basic research and moving them quickly and efficiently into medical practice to improve disease treatment or other health outcomes.
- Clinical Trials Research - the comparative testing of new treatment ideas against current standards of care to determine which is superior.
- Health Services Research - the study of health care access and health care delivery to detect deficiencies and design improvements. Health services research often involves careful analysis of databases.
- Population Health Research– the study of disease in populations to find risk factors and design prevention methods.

This year our annual report highlights a number of research initiatives including:

- Dr. Garnette Sutherland and his work on the neuroArm and its medical robotic applications.
- Dr. Paolo Federico’s Epilepsy Imaging Research Program which is making it easier for patients to be assessed clinically for epilepsy conditions.

- Neurologist Dr. Nathalie Jetté has helped to develop a web-based tool to guide family physicians in determining whether or not their patient is an appropriate candidate for epilepsy surgery.
- Dr. Chantel Debert, is an assistant professor in PM&R and a co-investigator involved in the *Safe to Play* grant funded by The Canadian Institutes of Health Research (CIHR). The study will measure the nature and extent of concussion injuries using new diagnostic measurements.
- A focused collaboration between PM&R, a division of DCNS and Alberta Ballet is in the works to develop a centre for performing arts medicine and science in Calgary. The goal of the program is to engage the dancers in injury prevention training, education and research initiatives.
- Dr. Sean Dukelow, assistant professor of Physical Medicine and Rehabilitation, is discovering new methods of rehabilitation for stroke survivors using robotics.

Our research-focused doctors and scientists are also members of: the Faculty of Medicine, Alberta Health Services (AHS) and the Hotchkiss Brain Institute from which they receive invaluable assistance, mentorship and support. Indeed, much of our success in research as a clinical group can be traced to these very strong linkages.

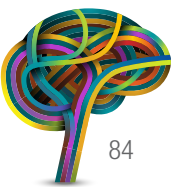
Our research often involves patients of AHS and we are indebted to them for the funding that helps to facilitate all types of health care research. Our faculty members publish the results of their studies in the top medical and scientific journals and they play leading roles in a wide variety of local, national, and international academic and professional organizations. Their efforts are generously supported by grants from a wide range of external agencies. We are very proud of our research tradition and international standing.

DCNS Grants 2012-2013

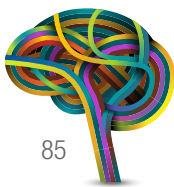
Division, Faculty Member, Title	Role	Funding Source	Total Awarded
Experimental Neurosciences Division			
Hu, Bin			
AmbuloSono: a sensorimotor contingent musical walking program for people living with Parkinson's disease	principal investigator	Alberta Innovates - Health Solutions (AIHS)	\$750,000.00
1) Music walking program for Parkinson's 2) Brisk and music walking for cognitive training in PD	principal investigator	Hotchkiss Brain Institute	\$120,000.00
Diabetes and falling: the potential role of neuropathic pain	co-principal investigator	Canadian Institutes of Health Research	\$146,000.00
Hullinger, Manuel			
Neuro-locomotor rehabilitation after large-fibre somatosensory loss	principal investigator	Canadian Institutes of Health Research	\$706,730.00
Nguyen, Minh Dang			
Role of the cytoskeleton	principal investigator	HBI, The University of Calgary	\$350,000.00
Structural and signaling roles of the cytoskeleton in neuronal survival	principal investigator	Canadian Institutes of Health Research	\$700,000.00
Surviving the break-up in DNA damage response with a novel partner: TPX2	principal investigator	Canadian Institutes of Health Research	\$270,000.00
DNA damage and DNA repair: The story of the spindle assembly factor TPX2	principal investigator	Alberta Innovates Health Solutions (AIHS)	\$66,000.00
Molecular mechanisms underlying neuropsychiatric disorders centered on Ndel1-DISC1	principal investigator	National Research Foundation of Korea	\$25,000.00
Ousman, Shalina			
Equipment grant	principal investigator	HBI	\$3,000.00
The alphaB-crystallin of peripheral nerve regeneration.	principal investigator	University Research Grants Committee The University of Calgary	\$17,500.00
Endogenous protective mechanisms in multiple sclerosis	principal investigator	HBI	\$350,000.00
Mechanisms underlying alphaB-crystallin function in multiple sclerosis.	principal investigator	Canadian Institutes of Health Research	\$586,244.00
Function of alphaB-crystallin in multiple sclerosis	principal investigator	Alberta Innovates - Health Solutions (AIHS)	\$35,000.00
Cystatin C: Friend or foe in multiple sclerosis?	principal investigator	Alberta EndMS Regional Research and Training Centre	\$15,000.00
Yong, V. Wee			
Understanding and manipulating microglia/macrophage activity following intracerebral hemorrhage to confer neuroprotection	principal investigator	Heart & Stroke Foundation of Canada	\$114,000.00



Experimental Neurosciences Division			
Yong, V. Wee			
Cerebrospinal fluid and MRI determinants of recovery from acute spinal cord injury in humans	principal investigator	Alberta Paraplegic Foundation	\$200,000.00
Chondroitin sulfate proteoglycans (CSPGs) as inhibitors of remyelination in MS	principal investigator	Multiple Sclerosis Society of Canada	\$400,000.00
Regulation of neuroinflammation and neuropathology in multiple sclerosis by the MMP inducer, EMMPRIN	principal investigator	Canadian Institutes of Health Research	\$816,585.00
A phase III double-blind, randomized, placebo-controlled trial of minocycline in clinically isolated syndromes (CIS).	co-investigator	Multiple Sclerosis Society of Canada Foundation Grant	\$4,000,000.00
Endogenous progenitor cell repair in multiple sclerosis.	team grant investigator	Stem Cell Network	\$783,600.00
Neurology			
Barber, Philip			
MRI of Reperfusion following Endovascular treatment using Perfusion/Permeability and Evaluation of Regional InFarction to Understand Stroke Evolution (REPERFUSE)	principal investigator	Private Donation	\$25,000.00
Imaging Biomarker Diagnosis of Cognitive Impairment in Mild Stroke and TIA	principal investigator	Katty Taylor Vascular Dementia Research Chair	\$15,000.00
Becker, Werner			
Evaluation of an aerobic exercise program in migraine management	co-investigator	Neurology AARP Retro-grant	\$60,000.00
Percutaneous closure of patent foramen ovale in migraine with aura	principal investigator	St. Jude Medical	\$94,000.00
Changes in intracranial compliance in migraine subjects following a National Upper Cervical Chiropractic Association (NUCCA) atlas correction intervention	principal investigator	Upper Cervical Research Foundation Ralph R. Gregory Memorial Foundation Tao Foundation Hecht Foundation	\$160,000.00
Brownell, Keith			
Best Ethical Practices in Managing Uncertainty in Medical Diagnosis: An Investigation of Ethical Principles applied to Decision Making Catalyst Grant: Ethics \$50,000(1st Year)	co-investigator	Canadian Institutes of Health Research	\$50,000.00
Cairncross, Gregory			
Alberta Cancer Foundation Chair in Brain Tumour Research	principal investigator	Philanthropy	\$165,000.00
Therapeutic Targeting of STAT3 in GBM	co-investigator	Alberta Cancer Foundation	\$750,000.00
Therapeutic Targeting of GBM	principal investigator	Terry Fox Foundation & Research Institute, Alberta Cancer Foundation, Alberta Innovates Health Solutions, Genome Canada	\$8,180,000.00

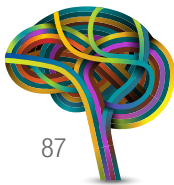
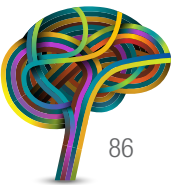


Neurology			
Cooke, Lara			
Completing a quality ITER: Can we influence the demonstrated skills of clinical supervisors?	co-investigator	Academy for Innovation in Medical Education	\$21,875.00
Can Neurology Residents' Empathy be Enhanced?	principal investigator	American Academy of Neurology	\$9,800.00
Using a Change Management Approach to implement a CanMEDS direct observation assessment instrument	principal investigator	Association of Faculties of Medicine of Canada	\$4,000.00
Assessment and Treatment of Aggression in Children with Disruptive Behaviour Disorders: Development of an educational curriculum for residency education and an eCME program for practicing physicians.	co-investigator	Canadian Institutes of Health Research	\$24,891.00
Costello, Fiona			
Assessment of the Performance and Reliability of Newly Built multifocal Visual Evoked Potential Systems by Vision Sight	principal investigator	Biogen Idec.	\$15,000.00
The Influence of Hormonal Contraceptive Use and Reproductive Hormone Levels on Optic Neuritis in Women Duration: 2012 – 2015 Amount: \$16,091.00 Principal Investigators: Dr. Jodie Burton and Dr. Fiona Costello	co-principal investigator	University Research Grants Committee (URGC)	\$16,091.00
Use of optical coherence tomography (OCT) in the study of Parkinson's Disease and other parkinsonian syndromes	co-principal investigator	Hotchkiss Brain Institute - private donor	\$80,000.00
Determining the relationship between chronic cerebro-spinal venous insufficiency (CCSVI) and multiple sclerosis (MS): A cross-sectional, case control study comparing ultrasonography (US) and magnetic resonance venography (MRV) measures of venous patency to structural and functional outcomes in a heterogenous MS cohort.	principal investigator	Multiple Sclerosis Society of Canada	\$200,000.00
The clinical-demographic, epidemiology, pathobiology, neuroimaging features and outcome of acute demyelination in Canadian children	co-investigator	Multiple Sclerosis Society of Canada	\$3,273,466.71
A Multicenter Collaborative Study on the Clinical Features, Expression Profiling, and Quality of Life in Pediatric Fascioscapulohumeral Muscular Dystrophy (EID 24052)	co-investigator	US FSH-Society and Muscular Dystrophy Canada	\$96,600.00
Coutts, Shelagh			
Extended CATCH	principal investigator	Pfizer Cardiovascular Award	\$200,000.00
TNK-tPA Evaluation for Minor stroke with Proven occlusion (TEMPO-1) study.	co-principal investigator	AIHS Private Donation	\$150,000.00
Diagnosis Of Uncertain-origin Benign Transient neurological symptoms (DOUBT).	principal investigator	Canadian Institutes of Health Research	\$93,000.00
Diagnosis Of Uncertain-origin Benign Transient neurological symptoms (DOUBT).	principal investigator	Canadian Institutes of Health Research	\$594,855.00
CT And MRI in the Triage of TIA and minor Cerebrovascular events to identify High risk patients. (CATCH).	principal investigator	Pfizer Cardiovascular research award	\$200,000.00
Alberta Stroke Prevention in TIAs and mild strokes (ASPIRE).	co-principal investigator	Heart & Stroke Foundation of Canada	\$600,000.00

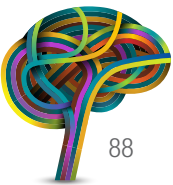


Neurology			
Reducing Stroke burden with hospital-ready biomarker test for rapid TIA triage.	co-principal investigator	Genome Canada	\$4,878,969.00
Demchuk, Andrew			
Identifying New approaches to optimize Thrombus characterization for predicting Early Recanalization and Reperfusion with iv tPA using Serial CT angiography (INTERRSeCT).	international principal investigator	CIHR – Bridge Funding	\$100,000.00
Spot Sign Selection of Intracerebral Hemorrhage to Guide Hemostatic Therapy (SPOTLIGHT): A Randomized Controlled Study.	co-principal investigator	Canadian Institutes of Health Research	\$1,456,206.00
Spousal relationships and neurobehavioural sequelae post-mild stroke.	co-investigator	Heart & Stroke Foundation of Canada	\$156,000.00
Predicting hEmatoma growth anD outcome in Intracerebral hemorrhage using contrast bolus CT (PREDICT) study.	principal investigator	Novo Nordisk Canada	\$62,000.00
Identifying New approaches to optimize Thrombus characterization for predicting Early Recanalization and Reperfusion with iv tPA using Serial CT angiography (INTERRSeCT).	international principal investigator	Canadian Institutes of Health Research	\$261,447.00
Feasby, Thomas			
Systematic Review of Evolving Evidence Linking MS and CCSVI	co-investigator	Canadian Institutes of Health Research	\$198,600.00
MRI Imaging for Back pain	co-investigator	Canadian Institutes of Health Research	\$94,452.00
Federico, Paolo			
Predicting seizure onset.	principal investigator	Canadian Institutes of Health Research	\$609,245.00
Voxel-based relaxometry in focal epilepsy	principal investigator	Epilepsy Canada	\$100,000.00
Neurovascular changes preceeding seizures.	principal investigator	Hotchkiss Brain Institute	\$20,000.00
Neurovascular changes associated with the pre-ictal state.	principal investigator	University of Calgary, Faculty of Medicine	\$20,000.00
Fletcher, William			
A Multicentre, Double-blind, Randomized, Placebo-controlled Study of Weight-Reduction and/or Low Sodium Diet plus Acetazolamide vs Diet plus Placebo in Subjects with Idiopathic Intracranial Hypertension with Mild Visual Loss	local principal investigator	National Institutes of Health Research (NIH US)	\$20,000.00
Study of the Vestibulo-Ocular Reflex in Normal Subjects and Patients with Vestibular Dysfunction	co-principal investigator	Rosza Endowment for Hearing Research	\$24,600.00
Hill, Michael Douglas			
(ESCAPE) Endovascular treatment for Small Core and Anterior circulation Proximal occlusion with Emphasis on minimizing CT to recanalization times	international principal investigator	Covidien	\$2,700,000.00
TEMPO-1. Thrombolysis for Minor Ischemic Stroke With Proven Acute Symptomatic Occlusion Using Tnk-tPA	co-principal investigator	Heart & Stroke Foundation of Canada	\$150,000.00
The Neurological diseasE and Depression Study (NEEDS)	co-investigator	Hotchkiss Brain Institute	\$150,000.00

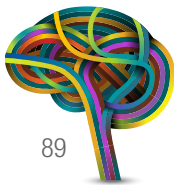
Neurology			
Hill, Michael Douglas			
Spousal relationships and neurobehavioural sequellae post-mild stroke	co-investigator	Heart & Stroke Foundation of Canada	\$156,000.00
Identifying Novel approaches to optimize arterial imaging interpretation for predicting and measuring recanalization whatever the Treatment and to optimize parenchymal imaging interpretation for prediction of Early neurological Recovery after Recanalization using Serial CT angiography (INTERRsECT TRIAL)	co-investigator	Canadian Institutes of Health Research	\$261,446.00
Enhancement of developmental motor plasticity in perinatal stroke with TDCS.	co-investigator	Heart & Stroke Foundation of Canada	\$270,000.00
DOUBT - Diagnosis Of Uncertain-origin Benign Transient neurological symptoms	co-investigator	Canadian Institutes of Health Research	\$594,855.00
PeriOperative ISchemic Evaluation-2 (POISE-2) Trial	co-investigator	Canadian Institutes of Health Research	\$3,684,006.00
ALIAS study - Albumin in Acute Stroke Trial	co-principal investigator	National Institutes of Health Research (NIH US)	\$24,000,000.00
Strategic Team in Applied Injury Research	team grant investigator	Canadian Institutes of Health Research	\$2,000,000.00
Jetté, Nathalie			
Neuroscience Health Services Research	principal investigator	Canada Research Chair Tier 2	\$500,000.00
Development of an appropriateness and necessity rating tool to identify patients with potentially resectable focal epilepsy.	principal investigator	Alberta Innovates - Health Solutions (AIHS)	\$700,000.00
Improving appropriate care for those with epilepsy - Knowledge translation of the CASES clinical decision support tool	principal investigator	Canadian Institutes of Health Research	\$90,000.00
The NEurological diseasE and Depression Study (NEEDS)	principal investigator	Alberta Health Services, U of C Faculty of Medicine, Hotchkiss Brain Institute	\$450,000.00
Alberta neuro-epidemiological unit	principal investigator	Alberta Health and Wellness	\$300,000.00
Non-invasive evaluation of intracranial hypertension in severe traumatic brain injury: a pilot study.	co-investigator	University of Calgary	\$17,732.00
Biomarkers in epilepsy: from bench to bedside	principal investigator	University of Calgary - Conference Grant Competition	\$5,000.00
Understanding the epidemiology of neurological conditions and building the methodological foundation for surveillance	principal investigator	Public Health Agency of Canada	\$402,000.00
Neurological registry best practice guidelines and implementation toolkit	co-principal investigator	Public Health Agency of Canada	\$209,496.00
Innovations in Data, Evidence and Applications for Persons with Neurological Conditions (ideas PNC).	co-principal investigator	Public Health Agency of Canada	\$1,470,992.00



Neurology			
Jetté, Nathalie			
Canadian Longitudinal Study on Aging: Neurological Conditions Initiative (CLSA-NCI)	co-investigator	Public Health Agency of Canada	\$651,902.00
Validation of administrative data algorithms to determine population prevalence and incidence of Alzheimer's Disease, Dementia, Multiple Sclerosis, Epilepsy and Parkinson's Disease	co-investigator	Public Health Agency of Canada	\$553,681.00
Effect of physician alternative payment plans on the completeness and validity of administrative data	co-principal investigator	CIHR - Health Services Evaluation & Interventions Research	\$205,139.00
Enhancing existing capacity in applied health services and policy research in Western Canada	co-investigator	CIHR - Program: Training Grants	\$1,789,998.00
Canadian Primary Care Sentinel Surveillance Network: Neurological Conditions	local sub-investigator	Public Health Agency of Canada	\$1,013,297.00
Koch, Marcus			
Discretionary funds for MS research	principal investigator	University of Calgary	\$200,000.00
Menon, Bijoy			
Identifying New approaches to optimize Thrombus characterization for predicting Early Recanalization and Reperfusion with iv tPA and other treatments using Serial CT angiography (INTERSeCT)	co-investigator	Canadian Institutes of Health Research	\$361,447.00
Determinants of Variability in Collateral Status in Patients with Acute Ischemic Stroke	principal investigator	Heart & Stroke Foundation of Canada	\$100,000.00
Seeking Novel Approaches to Augment Collateral Blood Flow to Ischemic Brain Tissue	co-investigator	Faculty of Medicine, University of Calgary	\$200,000.00
Metz, Luanne			
HMR 1726D/2001/2002, Phase II Study of the safety and efficacy of teriflunomide in Multiple Sclerosis eith relapses (study extensions)	local principal investigator	Aventis	\$102,781.00
The Alberta MS Initiative (TAMSI): Phase I Multiple Sclerosis Database to Study Chronic Cerebrospinal Venous Insufficiency (CCSVI)	principal investigator	Alberta Health	\$1,000,000.00
Combi-RX: A Multi-Centre, Double-Blind, Randomized Phase III Study Comparing Combined Use of Interferon Beta-1a and Glatiramer Acetate to Either Agent Alone in Patients with Relapsing-Remitting Multiple Sclerosis	local principal investigator	NIH	\$260,000.00
Phase III double-blind, randomized, placebo-controlled trial of minocycline in clinically isolated syndrome (CIS)	principal investigator	Multiple Sclerosis Society of Canada	\$4,050,000.00
Endogenous Progenitor Cell Repair in Multiple Sclerosis (PA4)	co-principal investigator	Stem Cell Genomics and Therapeutics Network	\$243,600.00
Fine-tune inflammation for neuroprotection and regeneration in multiple sclerosis	co-principal investigator	Neuroscience Canada Foundation	\$1,500,000.00
Mental Health and Disability in People with MS	co-investigator	Alberta Mental Health Research Fund	\$210,000.00



Neurology			
Metz, Luanne			
Measures of Corpus Callosum Function in MS: Development of an outcome measure	co-investigator	MS Society of Canada	\$42,580.00
Pilot initiative to assist MS Clinics, provincial ministries of health, federal government and CIHI to understand the process and cost implications of submitting to the Canadian MS Monitoring System	local principal investigator	Canadian Institutes of Health Research	\$15,000.00
Medicines for remyelination in Multiple Sclerosis: The next frontier.	co-principal investigator	Alberta Innovates - Health Solutions (AIHS)	\$25,000.00
Patry, David			
BMS, Phase 2 trial, oral selective gamma secretase inhibitor708163Summary: A phase 2, multicenter, randomized double blind placebo-controlled study of the safety, tolerability and pharmacokinetic effects of BMS–708163 in the Rx of patients with prodromal AD.	principal investigator	Bristol Meyers Squib	\$140,000.00
A Prospective, Randomized, Double-Blind, Placebo-Controlled, Phase 2 Efficacy and Safety Study of Oral ELND005 for Treatment of Agitation and Aggression in Patients with Moderate to Server Alzheimer's Disease. Elanag201 (Phase 2 study)	principal investigator	ElanPharma International Limited	\$98,000.00
Pringsheim, Tamara			
Knowledge Translation of the Canadian Guidelines on the Treatment of Tourette Syndrome	principal investigator	Private Donation	\$10,000.00
Assessment and treatment of aggression in children with disruptive behaviour disorders: Development of an educational curriculum for residency education and an eCME program	principal investigator	Canadian Institutes of Health Research	\$24,891.00
Monitoring Antipsychotic Safety in Children: Knowledge Translation and Exchange of the CAMESA Guideline	principal investigator	Alberta Innovates - Health Solutions (AIHS)	\$19,025.00
Clinical practice guideline on the diagnosis and treatment of Tourette Syndrome and co-morbid disorders	principal investigator	Tourette Syndrome Foundation of Canada	\$15,000.00
Knowledge Translation and Dissemination of an Antipsychotic Safety Monitoring Guideline for Children	principal investigator	Canadian Institutes of Health Research	\$75,227.00
Neurological registry best practice guidelines and implementation toolkit	co-principal investigator	Public Health Agency of Canada	\$200,000.00
Incidence and prevalence of neurological disorders in Canada and worldwide	co-principal investigator	Public Health Agency of Canada	\$402,000.00
Systematic review of factors influencing the onset and progression of priority neurological conditions	co-investigator	Public Health Agency of Canada	\$681,374.00
Innovations in data, evidence and applications for persons with neurological conditions	co-investigator	Public Health Agency of Canada	\$1,477,342.00
Smith, Eric			
A Centre for Clinical Research in Cognitive Disorders and Dementia	co-principal investigator	Donation from the Ronald and Irene Ward Foundation to HBI	\$750,000.00



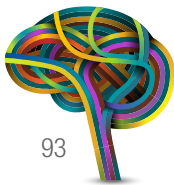
Neurology			
Smith, Eric			
Effectiveness of Aliskiren on Progression of White matter disease: An MRI Assessment Sub-Study of the Aliskiren in the Prevention of Major Cardiovascular Events in Elderly People (APOLLO) trial	co-investigator	McMaster University	\$80,000.00
Cerebral Small Vessel Disease and Beta-Amyloid Deposition in Subjects with Mildly Impaired Cognition	principal investigator	Alberta Innovates - Health Solutions (AIHS)	\$255,000.00
Small vessel disease and beta-amyloid deposition in mildly impaired cognition	co-principal investigator	U.S. National Institute of Neurological Disorders and Stroke	\$1,800,000.00
Cognition and Vascular Function in Cerebral Amyloid Angiopathy	principal investigator	Heart & Stroke Foundation of Canada	\$171,000.00
Neuropsychological and Cerebral Blood Flow Profile of Cerebral Amyloid Angiopathy	principal investigator	Alzheimer Society of Canada	\$37,848.00
Standards for Determining the Vascular Contribution to Neurodegeneration	co-principal investigator	Canadian Institutes of Health Research	\$33,167.00
Spousal relationships and neurobehavioural sequelae post-mild stroke	co-investigator	Heart & Stroke Foundation of Canada	\$150,000.00
MR Quantitative Iron Imaging in Alzheimer's Disease and Dementia	co-principal investigator	Alberta Innovates - Health Solutions (AIHS)	\$200,000.00
Cerebral Small Vessel Disease and Beta-Amyloid Deposition in Subjects with Mildly Impaired Cognition	principal investigator	Canadian Institutes of Health Research	\$300,000.00
Stys, Peter			
Scientist Award	principal investigator	Alberta Innovates - Health Solutions (AIHS)	\$1,190,000.00
The axo-myelinic synapse	principal investigator	Canadian Institutes of Health Research	\$845,320.00
Axo-glial Biology	principal investigator	Canada Research Chairs (CRC)	\$1,200,000.00
Targeting Cell Death Cascades in the Neuro Vascular-Inflammatory Unit	principal investigator	Canadian Stroke Network	\$165,000.00
Prion protein regulation of NMDA receptor-mediated Ca dynamics in white matter	co-investigator	Networks of Centres of Excellence (NCE)	\$110,000.00
Pathobiology of MS: complex interplay between degeneration and inflammation	principal investigator	Multiple Sclerosis Scientific Research Foundation	\$3,900,000.00
Toth, Cory			
A Mechanistic Investigation of Behavioral Co-morbidity in Chronic Inflammatory Disorders - Alberta Innovates Health Solutions, Collaborative Research and Innovation Opportunities Team Grant	co-principal investigator	Alberta Innovates - Health Solutions (AIHS)	\$250,000.00
The role of hyperlipidemia in diabetic leukoencephalopathy	principal investigator	Heart & Stroke Foundation of Canada	\$185,000.00
The role of hyperlipidemia in diabetic neuropathy	local principal investigator	HBI CRU	\$13,000.00

Neurology			
Toth, Cory			
The development of peripheral neuropathy in Parkinson's Disease	principal investigator	HBI CRU	\$16,000.00
The development of peripheral neuropathy in Parkinson's Disease	principal investigator	Parkinson Society of Canada	\$32,000.00
IVIg and experimental diabetic neuropathic pain	principal investigator	Baxter Ltd.	\$200,000.00
SCIG and the modulation of neuroinflammation in early diabetic neuropathy	principal investigator	CSL Interlaken Award	\$150,000.00
A randomized study of telemedicine in management of chronic neuropathic pain	principal investigator	Pfizer Canada	\$33,000.00
A randomized study of telemedicine in management of chronic neuropathic pain	principal investigator	Lilly International	\$33,000.00
A randomized controlled double blind study of morphine vs. methadone in chronic neuropathic pain	co-principal investigator	Canadian Institutes of Health Research	\$120,000.00
Wiebe, Samuel			
Efficacy and Safety of Brivaracetam in patients with partial onset Seizures	co-investigator	UCB	\$8,572.00
Follow up study of Long Term Safety and Efficacy of Brivaracetam used as adjunctive treatment in partial onset seizures.	co-investigator	UCB	\$9,313.00
Long-term use and safety of lacosamide monotherapy as adjunctive therapy in patients with partial-onset seizures.	co-investigator	UCB	\$8,215.00
Efficacy and safety of conversion to lacosamide 400mg/day monotherapy in subjects with partial-onset seizures.	co-investigator	UCB	\$9,731.00
Hopewell Professorship for Clinical Neurosciences Research	co-investigator	Hopewell Professorship	\$1,000,000.00
Understanding the epidemiology of neurological conditions	co-investigator	Public Health Agency of Canada	\$402,000.00
Prospective assessment electroencephalography in comatose neurocritical care patients.	co-investigator	Hotchkiss Brain Institute Clinical Research Unit	\$15,000.00
Efficacy and safety of E2007 (Perampanel) in refractory partial seizures	co-investigator	Eisai	\$18,000.00
Efficacy and safety of E2007 (Perampanel) in refractory partial seizures (E2007-G000-304)	co-investigator	Eisai	\$13,828.00
Neurological registry best practice guidelines and implementation toolkit	co-investigator	Public Health Agency of Canada	\$209,496.00
Knowledge Translation Supplementation Improving appropriate care for those with Epilepsy - Knowledge translation of the CASES clinical decisions support tool	co-investigator	Canadian Institutes of Health Research	\$90,000.00
The Neurological disease and Depression Study (NEEDS) - addressing the burden course and impact of depressive disorders in neurological conditions	co-investigator	Alberta Health Services and Hotchkiss Brain Institute	\$450,000.00



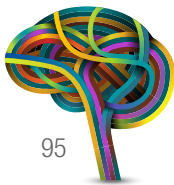
Neurology			
Zochodne, Douglas			
Diabetes and Skin Sensation	principal investigator	Canadian Diabetes Association	\$274,590.00
Molecular Roadblocks to Nerve Regeneration	principal investigator	Canadian Institutes of Health Research	\$692,860.00
Diabetes, neuron degeneration & insulin signalling	principal investigator	Canadian Institutes of Health Research	\$559,725.00
Regeneration Unit in Neurobiology (RUN)	principal investigator	CFI/ASRIP/HBI	\$3,240,930.00
Pain relief: receptor dynamics at the single molecule level	co-investigator	NSERC	\$363,000.00
Corneal confocal microscopy to detect diabetic neuropathy in children	co-investigator	Juvenile Diabetes Foundation	\$360,000.00
Peripheral neuropathy in Lentivirus infections: early viral and determinants of neurovirulence	co-investigator	NIH	\$1,230,000.00
DCC Pilot & Feasibility Study: “Pten Knockdown: A Novel Strategy to Reverse Diabetic Neuropathy”	principal investigator	National Institutes of Health Research (NIH US)	\$88,869.00
Molecular Roadblocks to Nerve Regeneration	principal investigator	Canadian Institutes of Health Research	\$138,572.00
Diabetes, neuron degeneration & insulin signalling	principal investigator	Canadian Institutes of Health Research	\$111,945.00
Regeneration Unit in Neurobiology (RUN)	principal investigator	Canadian Foundation for Innovation (CFI)	\$3,240,930.00
Neurosurgery			
Casha, Steve			
Minocycline in Acute Spinal Cord Injury - a Canadian multicenter study (MASC)	principal investigator	Alberta Paraplegic Foundation	\$140,256.00
The Graded and Redefined Assessment of Strength, Sensibility and Prehension (GRASSP): Responsiveness Testing Prior to Utilization in Clinical Trials, Minimally Clinical Important Difference and Meaningfulness of Change of the GRASSP	local principal investigator	Alberta Paraplegic Foundation	\$50,000.00
“MASC” - Minocycline in Acute Spinal Cord Injury	national principal investigator	Rick Hansen Man in Motion Legacy Fund	\$1,300,000.00
Gallagher, Clare			
Cerebral Energy Metabolism in Injured and Uninjured Brain	co-investigator	Medical Research Council	\$800,000.00
Cerebral metabolism in Severe Traumatic Brain Injury	principal investigator	HBI Rebecca Hotchkiss International Scholar Exchange	\$4,000.00

Neurosurgery			
Hader, Walter			
Development of a Canadian Pediatric Epilepsy Surgery Registry	principal investigator	Clinical Research Unit	\$14,400.00
Hamilton, Mark			
Adult Hydrocephalus Clinical Research Network Core Data Project	principal investigator	The Hydrocephalus Association	\$75,000.00
Team Leader for Hydrocephalus: Neurological Registry Best Practice Guidelines and Implementation Toolkit Project" with (2011-2013):	co-investigator	Public Health Agency of Canada	\$209,496.00
Co-investigator (Team Leader for Hydrocephalus) for Public Health Agency of Canada Grant: “Understanding the epidemiology of neurological conditions and building the methodological foundation for surveillance” with Dr N Jetté (210-2013)	co-investigator	Public Health Agency of Canada	\$402,000.00
Validation of Non-invasive Technologies to Measure Raised Intracranial Pressure in Humans	co-investigator	Alberta Innovates - Health Solutions (AIHS)	\$10,000.00
Phase 1 pharmacodynamic and “high content” study of the gamma-secretase inhibitor RO4929097 in patients with recurrent malignant gliomas targeting p75NTR to inhibit brain tumor initiating cells and recurrent invasive gliomas	co-investigator	National Cancer Institute of Canada	\$312,740.00
Hurlbert, John			
Surgery vs. Conservative Mangement of Type II Odontoid Fractures	principal investigator	AANS/CNS Apfelbaum Award	\$45,000.00
AANS/CNS Neuropoint Alliance SD	principal investigator	AANS/CNS	\$10,000.00
Jacobs, Bradley			
Mean Arterial Pressure in Spinal Cord Injury (MAPS): Determination of non-inferiority of a mean arterial pressure of 65 mmHg compared to a mean arterial pressure of 85 mmHg in acute human traumatic spinal cord injury.	national principal investigator	AANS/CNS Section of Spine and Peripheral Nerves	\$50,000.00
Canadian Multicenter CSF Pressure Monitoring and Biomarker (CAMPER) Study	co-principal investigator	Alberta Paralysis Foundation	\$160,000.00
Kiss, Zelma			
Equipment repair and replacement grant from the Hotchkiss Brain Institute	principal investigator	HBI	\$10,000.00
Database for movement disorder surgery	principal investigator	HBI	\$10,000.00
Sensory cueing, neuroplasticity and Parkinson’s disease rehabilitation	co-principal investigator	Canadian Institutes of Health Research	\$1,500,000.00
Mechanisms of therapeutic deep brain stimulation (DBS) for dystonia	principal investigator	Canadian Institutes of Health Research	\$383,947.00
Smart Neural Prostheses to Restore Motor and Sensory Function	co-principal investigator	Alberta Innovates - Health Solutions (AIHS)	\$5,000,000.00



Neurosurgery			
Midha, Rajiv			
Regeneration Unit in Neurobiology (RUN), D Zochodne PI, Midha and several others co-PIs.	co-principal investigator	CFI	\$3,240,933.00
Augmentation of nerve transfer procedures with precursor stem cells to improve neurological outcome. Midha R, Webb A.	principal investigator	Robertson Fund	\$29,608.00
Motor axon misdirection in traumatic neuroma-in-continuity injury in rodents. Alant J, Midha R.	principal investigator	AANS/CNS	\$15,000.00
Characterization of SKP-SC produced myelin.	principal investigator	Plastic Surgery Education Foundation	\$10,000.00
Peripheral nerve regeneration lab operating support	principal investigator	The University of Calgary	\$500,000.00
Peripheral Nerve Fellowship at the University of Calgary	principal investigator	Integra LifeSciences Foundation	\$25,000.00
Eyes High Postdoctoral Fellowship	co-principal investigator	University of Calgary	\$100,000.00
RMF-82496: Dynamic manipulation of nerve regeneration: an electronic-axon interface.	co-investigator	Canadian Institutes of Health Research	\$2,250,000.00
HBI and Integra LifeSciences Centre of Excellence in Nerve Regeneration at University of Calgary. Stem cell therapies for nerve repair and regeneration.	principal investigator	HBI and Intrgra for LifeSciences Centre for Excellence in Nerve Regeneration	\$75,000.00
Motor Axon misdirection in traumatic neuroma-in-continuity injury.	co-investigator	Plastic Surgery Education Foundation	\$10,000.00
Determining and optimizing the myeliantion capacity of skin derived precursors	principal investigator	Alberta endMS RRTC	\$15,000.00
Bioprocess production of skin derived precursor (SKP) Schwann cells as autologous cell therapy for nerve and spinal cord repair.	co-principal investigator	Alberta Innovates - Health Solutions (AIHS)	\$750,000.00
Mitha, Alim			
Tissue Engineering to Treat Intracranial Saccular Aneurysms	principal investigator	HBI	\$400,000.00
Drug-Eluting Bioabsorbable Stents for the Treatment of Cerebral Vasospasm Following Subarachnoid Hemorrhage	principal investigator	Brain Aneurysm Foundation	\$10,000.00
Starreveld, Yves			
Deep Brain Stimulation for Treatment Resistant Depressive Disorders	co-investigator	Alberta Innovates - Health Solutions (AIHS)	\$750,000.00

Neurosurgery			
Sutherland, Garnette			
Ceramic Aneurysm Clips	principal investigator	Private Donation	\$500,000.00
Connectivity	principal investigator	Private Donation	\$200,000.00
Advancing iMRI	principal investigator	Calgary Health Trust	\$1,800,000.00
Project NeuroArm: MR Compatible image-guided robot for microsurgery	principal investigator	Alberta Science and Research Authority	\$3,000,000.00
Development of an MR visible Biomarker for Tau following Mild Traumatic Brain Injury	principal investigator	Canadian Institutes of Health Research	\$100,000.00
Cerebral Metabolism in Traumatic Brain Injury	principal investigator	Canadian Institutes of Health Research	\$208,917.00
Development of a Molecular Imaging Program for CNS Neoplasia	co-principal investigator	Canadian Institutes of Health Research	\$1,200,000.00
Wong, John			
ENACT study: a phase II, multicenter randomized fasting double-blind placebo-controlled, safety, tolerability and efficacy study evaluating a single intravenous dose of NA-1 in male and female patients undergoing endovascular repair of brain aneurysms	local principal investigator	Industry Supported Research	\$377,136.00
ACORN (Alberta Comprehensive Outcomes Research in Neurosciences) database	co-principal investigator	AHS	\$114,000.00
Effect of an established blunt cerebrovascular injury screening protocol on detection rates and clinical outcomes	principal investigator	Department of Surgery, University of Calgary	\$2,000.00
Physical Medicine and Rehabilitation			
Benson, Brian			
Safe to Play: A longitudinal research program to establish best practice in the prevention, early diagnosis, and management of sport-related concussion in youth ice hockey players.	Co-Investigator	CIHR Team Grant	\$2, 500,000.00
Sport Concussion Clinical Research Program	principal investigator	Philanthropic donation	\$12,575.00
Quantitative Assessment and Validation of Sensorimotor Dysfunction and Recovery using Robotics in Athletes sustaining an Acute Sport-Related Concussion.	principal investigator	Own the Podium	\$160,000.00
Debert, Chantel			
Safe to Play: A longitudinal research program to establish best practice in the prevention, early diagnosis, and management of sport-related concussion in youth ice hockey players.	Co-Investigator	CIHR Team Grant	\$2,500,000.00
Quantitative Assessment and Validation of Sensorimotor Dysfunction and Recovery using Robotics in Athletes sustaining an Acute Sport-Related Concussion.	Co-Investigator	Own the Podium	\$160,000.00



Physical Medicine and Rehabilitation			
Dukelow, Sean			
Measuring Upper limb function following stroke	co-principal investigator	CPRIF	\$150,000.00
Limb Proprioception in Children with Perinatal Stroke Induced Cerebral Palsy	co-investigator	Cerebral Palsy International Research Foundation	\$100,000.00
Rehabilitation, Stroke Deficits and Robotic Technology (RESTART)	principal investigator	Canadian Institutes of Health Research	\$199,348.00
Rehabilitation, Stroke Deficits and Robotic Technology (RESTART)	principal investigator	Heart & Stroke Foundation of Canada	\$270,000.00
Enhancement of developmental motor plasticity in perinatal stroke with TDCS.	co-investigator	Heart & Stroke Foundation of Canada	\$270,000.00
Smart Neural Prostheses to restore sensory and motor function – an inter-disciplinary team grant	team grant investigator	Alberta Innovates - Health Solutions (AIHS)	\$5,000,000.00
Safe to Play	co-investigator	Canadian Institutes of Health Research	\$1,500,000.00
Development of an inpatient stroke rehabilitation clinical trials network.	co-principal investigator	Stroke Recovery Network/Canadian Stroke Network	\$150,000.00
Prevention of Pressure Ulcers in Intensive Care.	co-principal investigator	Clinexus/Alberta Innovates Technology Futures.	\$71,425.00
Gabriel, Vincent			
Transplant of Adult Human Dermal Precursors to Improve Split Thickness Skin Grafts	co-principal investigator	Stem Cell Network National Centres of Excellence	\$112,000.00
Autologous Dermal Stem Cells To Improve Outcomes in Split Thickness Skin Grafts	co-principal investigator	Alberta Innovates Health Solutions	\$1,125,000.00
Ho, Chester			
Alberta SCI Research Support Fund.	principal investigator	Alberta Paraplegic Foundation	\$107,850.00
Calgary Performance Arts Medicine Conference	principal investigator	Alberta Innovates - Health Solutions (AIHS)	\$5,000.00
Feasibility of an Internet Clinic for Treating and Preventing Pressure Ulcers: A collaboration with the Rick Hansen Institute E-23786	co-investigator	Rick Hansen Foundation, Spinal Cord Injury Solutions, Ontario Neurotrauma Foundation, Alberta Paraplegic Foundation	\$74,785.00
Alberta SCI Research Facilitator	principal investigator	Alberta Paraplegic Foundation	\$195,000.00
W21C: Interdisciplinary Research and Innovation for Health System Quality and Safety	team grant investigator	Alberta Innovates - Health Solutions (AIHS)	\$5,000,000.00

Publications

in Clinical Neurosciences 2012-2013

Experimental Neurosciences - Faculty Member, Title, Authors, Citation

Dr. Bin Hu *Alterations of Neocortical Development and Maturation in Autism: Insight from valproic acid exposure and animal models of autism.* T. Chomiak, Hu B Neurotoxicology and Teratology. 2013;36():(57-66)

Dr. Minh Dang Nguyen *Targeting Protein for Xenopus kinesin like protein 2 (TPX2) regulates gamma-H2AX levels upon ionizing radiation* Neumayer G, Helfricht A, Shim S, Le Thi H, Lundin C, Belzil C, Chansard M, Gruss O, Lees Miller SP, van Attikum H, Helleday T & Nguyen MD J Biol Chem. 2012;287():(42206-42222)

Dr. Minh Dang Nguyen *UBR4, a N-recognin of the the N-end rule pathway, and its role in yolk sac vascular development and autophagy* Tasaki T, Kim ST, Zakrzewska A, Lee BE, Kang MJ, Yoo YD, Cha-Molstad HJHwang J, Soung NK, Sung KS, Kim SH, Nguyen MD, Sun M, Yi EC, BY Kim & Kwon YT. Proc Natl Acad Sci USA. 2013;110(10):(3800-5)

Dr. Minh Dang Nguyen *p600 plays essential roles in cardiac and placental organization during mouse embryonic development* Nakaya T, Ishiguro KI, Bronson RT, Mizuno SI, Herlitz AM, Yu Q, Geng Y, Belzil C, Nguyen MD, Akashi K, Sicinski P & Nakatani PLoS ONE . 2013;():()

Dr. Minh Dang Nguyen *A Ca2+-dependent mechanism of neuronal survival mediated by the microtubule-associated protein p600* Belzil C, Neumayer G, Vassilev AP, Yap KL, Konishi H, Rivest S, Sanada S, Ikura M, Nakatani Y & Nguyen MD J Biol Chem . 2013;():()

Dr. Shalina Ousman (2013) *Piet Mondrian’s trees and the evolution in understanding multiple sclerosis, Charcot Prize Lecture 2011.* Steinman L, Axtell RC, Barbieri D, Bhat R, Brownell SE, de Jong BA, Dunn SE, Grant JL, Han MH, Ho PP, Kuipers HF, Kurnellas MP, Ousman SS and Rothbard JB. J. Biol. Chem.. 2012;287(43):(36423-34)

Dr. Shalina Ousman (2012) *Immune surveillance in the central nervous system.* Ousman SS and Kubes P. Nat. Neurosci.. 2012;15(8):(1096-101)

Dr. Shalina Ousman (2013) *Characterisation of migration parameters on peripheral and central nervous system T cells following treatment of experimental allergic encephalomyelitis with CRYAB* Oyebamiji AI, Finlay TM, Hough RM, Hoghooghi V, Lim E-MF, Wong CHY and Ousman SS J. Neuroimmunol. 2013;():()

Dr. V Wee Yong *Overcoming neurite-inhibitory chondroitin sulfate proteoglycans in the astrocyte matrix.* Cua RC, Lau LW, Keough MB, Midha R, Apte SS, Yong VW Glia. 2013;():(NA)

Dr. V Wee Yong *Environmental factors and their regulation of immunity in multiple sclerosis.* Koch MW, Metz LM, Agrawal SM, Yong VW J Neurol Sci. 2013;324(1-2):(10-6)

Dr. V Wee Yong *Review: Endocrine disrupting chemicals and immune responses: a focus on bisphenol-A and its potential mechanisms.* Rogers JA, Metz L, Yong VW Mol Immunol. 2013;53(4):(421-30)

Dr. V Wee Yong *Cortical remyelination: a new target for repair therapies in multiple sclerosis.* Chang A, Staugaitis SM, Dutta R, Batt CE, Easley KE, Chomyk AM, Yong VW, Fox RJ, Kidd GJ, Trapp BD Ann Neurol. 2012;72(6):(918-26)

Dr. V Wee Yong *Remyelination therapy for multiple sclerosis.* Keough MB, Yong VW Neurotherapeutics. 2013;10(1):(44-54)

Dr. V Wee Yong *Chondroitin sulfate proteoglycans in demyelinated lesions impair remyelination.* Lau LW, Keough MB, Haylock-Jacobs S, Cua R, Döring A, Sloka S, Stirling DP, Rivest S, Yong VW Ann Neurol. 2012;72(3):(419-32)

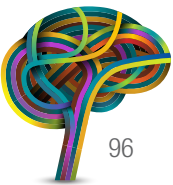
Dr. V Wee Yong *Susceptibility-weighted imaging in the experimental autoimmune encephalomyelitis model of multiple sclerosis indicates elevated deoxyhemoglobin, iron deposition and demyelination.* Nathoo N, Agrawal S, Wu Y, Haylock-Jacobs S, Yong VW, Foniok T, Barnes S, Obenaus A, Dunn JF Mult Scler. 2012;():()

Dr. V Wee Yong *Prolactin in multiple sclerosis.* Zhornitsky S, Yong VW, Weiss S, Metz LM Mult Scler. 2013;19(1):(15-23)

Dr. V Wee Yong *Immune cell infiltrates in atypical teratoid/rhabdoid tumors.* Lu JQ, Wilson BA, Yong VW, Pugh J, Mehta V Can J Neurol Sci. 2012;39(5):(605-12)

Dr. V Wee Yong *Kinetics of proinflammatory monocytes in a model of multiple sclerosis and its perturbation by laquinimod.* Mishra MK, Wang J, Silva C, Mack M, Yong VW Am J Pathol. 2012;181(2):(642-51)

Dr. V Wee Yong *Lipocalin 2 is a novel immune mediator of experimental autoimmune encephalomyelitis pathogenesis and is modulated in multiple sclerosis.* Berard JL, Zarruk JG, Arbour N, Prat A, Yong VW, Jacques FH, Akira S, David S Glia. 2012;60(7):(1145-59)



Neurology - Faculty Member, Title , Authors, Citation

Dr. Philip Barber *A dietary polyphenol resveratrol acts to provide neuroprotection in recurrent Stroke models by regulating AMPK and SIRT1 signaling, thereby reducing energy requirements during ischemia.* Wang LM, Wang YJ, Cui M, Luo WJ, Wang XJ, Barber PA, Chen ZY Eur J Neurosci. 2013;(0):()

Dr. Philip Barber *Tissue Window in Stroke Thrombolysis study (TWIST): a safety study.* Hill MD, Kenney C, Dzialowski I, Boulanger JM, Demchuk AM, Barber PA, Watson TW, Weir NU, Buchan AM, Calgary Stroke Program Can J Neurol Sci. 2013;40(1):(17-20)

Dr. Philip Barber *Combined full-dose IV and endovascular thrombolysis in acute ischaemic stroke.* Bhatia R, Shobha N, Menon BK, Bal SP, Kochar P, Palumbo V, Wong JH, Morrish WF, Hudon ME, Hu W, Coutts SB, Barber PA, Watson T, Goyal M, Demchuk AM, Hill MD Int J Stroke. 2012;(0):()

Dr. Philip Barber *Protection against Recurrent Stroke with Resveratrol: Endothelial Protection.* IoS One. 2012;7(10):() Clark D, Tuor UI, Thompson R, Institoris A, Kulynych A, Zhang X, Kinniburgh DW, Bari F, Busija DW, Barber PA.

Dr. Philip Barber *Relating ASPECTS infarct location to stroke disability in the NINDS rt-PA trial: proof of concept study using penalized logistic regression.* Thanh G Phan, Andrew Demchuk,Velandai Srikanth, Brian Silver, Suresh C Patel, Philip A Barber, Steven R Levine, Michael D Hill. Cerebral Vascular Disease. 2013;(0):()

Dr. Werner Becker *Patterns of Use and Reasons for Discontinuation of Prophylactic Medications for Episodic Migraine and Chronic Migraine: Results From the Second International Burden of Migraine Study (IBMS-II).* Blumenfeld AM, Bloudek LM, Becker WJ, Buse DC, Varon SF, Maglinte GA, Wilcox TK, Kawata AK, Lipton RB Headache. 2013;53(4):(644-55)

Dr. Werner Becker *Spontaneous intracranial hypotension: recommendations for management.* Amoozegar F, Guglielmin D, Hu W, Chan D, Becker WJ Can J Neurol Sci. 2013;40(2):(144-57)

Dr. Werner Becker *SUNCT, SUNA and pituitary tumors: clinical characteristics and treatment.* Chitsantikul P, Becker WJ Cephalalgia. 2013;33(3):(160-70)

Dr. Werner Becker *Occipital stimulation for chronic migraine: patient selection and complications.* Kiss ZH, Becker W Can J Neurol Sci. 2012;39(6):(807-12)

Dr. Keith W. Brownell *Homozygous lamin A/C familial lipodystrophy R482Q mutation in autosomal recessive Emery Dreifuss muscular dystrophy.* Wiltshire KM, Hegele RA, Innes AM, Brownell AK Neuromuscul Disord. 2013;23(3):(265-8)

Dr. Gregory Cairncross *Treating brain tumor-initiating cells using a combination of myxoma virus and rapamycin.* Zemp FJ, Lun X, McKenzie BA, Zhou H, Maxwell L, Sun B, Kelly JJ, Stechishin O, Luchman A, Weiss S, Cairncross JG, Hamilton MG, Rabinovich BA, Rahman MM, Mohamed MR, Smallwood S, Senger DL, Bell J, McFadden G, Forsyth PA Neuro Oncol. 2013;(0):()

Dr. Gregory Cairncross *On-target JAK2/STAT3 inhibition slows disease progression in orthotopic xenografts of human glioblastoma brain tumor stem cells.* Stechishin OD, Luchman HA, Ruan Y, Blough MD, Nguyen SA, Kelly JJ, Cairncross JG, Weiss S Neuro Oncol2013;15(2):(198-207)

Dr. J. Gregory Cairncross *Phase III trial of chemoradiotherapy for anaplastic oligodendroglioma: long-term results of RTOG 9402.* J Cairncross G, Wang M, Shaw E, Jenkins R, Brachman D, Buckner J, Fink K, Souhami L, Laperriere N, Curran W, Mehta M Clin Oncol. 2013;31(3):(337-43)

Dr. Fiona Costello *Retinal nerve fiber layer thickness in benign multiple sclerosis.* Lange AP, Zhu F, Sayao AL, Sadjadi R, Alkabie S, Traboulsee AL, Costello F, Tremlett H Mult Scler. 2013;(0):()

Dr. Fiona Costello *Diaschisis as the presenting feature in sporadic creutzfeldt-jakob disease.* Wile D, Dhaliwal H, Sarna JR, Molnar CP, Scott JN, Costello F, Furtado S, Joseph JT JAMA Neurol. 2013;70(3):(408-9)

Dr. Fiona Costello *Should optical coherence tomography be used to manage patients with multiple sclerosis?* Costello F, Van Stavern GP J Neuroophthalmol. 2012;32(4):(363-71)

Dr. Fiona Costello *Sex-specific differences in retinal nerve fiber layer thinning after acute optic neuritis.* Costello F, Hodge W, Pan YI, Burton JM, Freedman MS, Stys PK, Trufyn J, Kardon R Neurology. 2012;79(18):(1866-72)

Dr. Shelagh Coutts *Leptomeningeal collaterals are associated with modifiable metabolic risk factors.* Menon BK, Smith EE, Coutts SB, Welsh DG, Faber JE, Goyal M, Hill MD, Demchuk AM, Damani Z, Cho KH, Chang HW, Hong JH, Sohn SI Ann Neurol. 2013;(0):()

Neurology - Faculty Member, Title , Authors, Citation

Dr. Shelagh Coutts *The intracerebral hemorrhage acutely decreasing arterial pressure trial.* Butcher KS, Jeerakathil T, Hill M, Demchuk AM, Dowlatshahi D, Coutts SB, Gould B, McCourt R, Asdaghi N, Findlay JM, Emery D, Shuaib A, ICH ADAPT Investigators Stroke. 2013;44(3):(620-6)

Dr. Shelagh Coutts *Early magnetic resonance imaging in transient ischemic attack and minor stroke: do it or lose it.* Moreau F, Modi J, Almekhlafi M, Bal S, Goyal M, Hill MD, Coutts SB Stroke. 2013;44(3):(671-4)

Dr. Shelagh Coutts *The Alberta Stroke Prevention in TIAs and mild strokes (ASPIRE) intervention: rationale and design for evaluating the implementation of a province-wide TIA Triaging system.* Jeerakathil T, Shuaib A, Majumdar SR, Demchuk AM, Butcher KS, Watson TJ, Dean N, Gordon D, Edmond C, Coutts SB, ASPIRE Investigators Int J Stroke. 2012;(0):()

Dr. Shelagh Coutts *High rate of magnetic resonance imaging stroke recurrence in cryptogenic transient ischemic attack and minor stroke patients.* Bal S, Patel SK, Almekhlafi M, Modi J, Demchuk AM, Coutts SB Stroke. 2012;43(12):(3387-8)

Dr. Shelagh Coutts *What causes disability after transient ischemic attack and minor stroke?: Results from the CT and MRI in the Triage of TIA and minor Cerebrovascular Events to Identify High Risk Patients (CATCH) Study.* Coutts SB, Modi J, Patel SK, Aram H, Demchuk AM, Goyal M, Hill MD Stroke. 2012;43(11):(3018-22)

Dr. Shelagh Coutts *Poor prognosis in warfarin-associated intracranial hemorrhage despite prothrombin complex concentrate therapy: the CanPro registry.* Dowlatshahi D, Butcher KS, Asdaghi N, Nahirniak S, Bernbaum M, Giulivi A, Wasserman J, Poon M, COUTTS SB, on behalf of the CanPro Investigators. Stroke. 2012;43(7):(1837-1842)

Dr. Shelagh Coutts *Early MRI in TIA and minor stroke: do it or lose it.* Moreau F, Modi J, Almekhlafi M, Bal S, Hill MD, COUTTS SB. Stroke. 2013;44(3):(671-674)

Dr. Shelagh Coutts *Cavitation following acute symptomatic stroke depends on time, location and MRI sequence.* Moreau F, Patel S, Lauzon ML, McCreary CR, Goyal M, Frayne R, Demchuk AM, COUTTS SB, Smith ES. Stroke. 2012;43(0):(1837-1842)

Dr. Shelagh Coutts *Combined Full Dose IV and Endovascular Thrombolysis in Acute Ischemic Stroke.* Bhatia, R, Shobha N, Menon BK, Bal SP, Kochar P, Palumbo V, Wong JH, Morrish WF, Hudon ME, Hu W, COUTTS SB, Barber PA, Watson T, Goyal M, Demchuk AM Hill MD. International Journal of Stroke. 2012;7(s1):()

Dr. Shelagh Coutts *Poor Prognosis in Warfarin-Associated Intracranial Hemorrhage Despite Anticoagulation Reversal.* Dowlatshahi D, Butcher KS, Asdaghi N, Nahirniak S, Bernbaum ML, Giulivi A, Wasserman JK, Poon MC, Coutts SB, on behalf of the Canadian PCC Registry (CanPro) Investigators Stroke. 2012;(0):()

Dr. Andrew Demchuk *Planimetric Hematoma Measurement in Patients With Intraventricular Hemorrhage: Is Total Volume a Preferred Target for Reliable Analysis?* Dowlatshahi D, Kosior JC, Idris S, Eesa M, Dickhoff P, Joshi M, Subramaniam S, Tymchuk S, Hill MD, Aviv RI, Frayne R, Demchuk AM, on behalf of the PREDICT/Sunnybrook ICH-CTA study group Stroke. 2012;43(7):(1961-63)

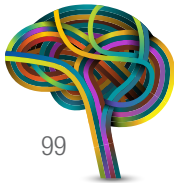
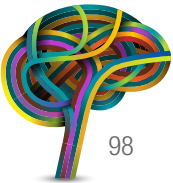
Dr. Andrew Demchuk *A Meta-Analysis of Observational Intra-Arterial Stroke Therapy Studies Using the Merci Device, Penumbra System, and Retrievable Stents.* Almekhlafi MA, Menon BK, Demchuk AM, Goyal M. American Journal of Neuroradiology. 2013;34(1):(140-145)

Dr. Andrew Demchuk *Tissue Window in Stroke Thrmobolysis SStudy (TWIST): A Safety Study.* Hill MD, Kenney C, Dzialowski I, Boulanger JM, Demchuk AM, Barber PA, Watson TWJ, Weir NU, Buchan AM. Canadian Journal of Neurological Sciences. 2013;40(1):(17-20)

Dr. Andrew Demchuk *Intra-Arterial Stroke Therapy Studies Using the Merci Device, Penumbra System, and Retrievable Stents.* Almekhlafi MA, Menon Bk, Freiheit EA, Demchuk AM, Goyal M. American Journal of Neuroradiology. 2012;(0):()

Dr. Andrew Demchuk *Routine CT Angiography in Acute Stroke Does Not Delay Thrombolytic Therapy* Bal S, Menon BK, Demchuk AM, Hill MD. Can J Neurol Sc.. 2012;39(4):(499-501)

Dr. Andrew Demchuk *Telmisartan on top of antihypertensive treatment does not prevent progression of cerebral white matter lesions in the prevention regimen for effectively avoiding second strokes (PRoFESS) MRI substudy.* Weber R, Weimar C, Blatchford J, Hermansson K, Wanke I, Moller-Hartmann C, Gizewski ER, Forsting M, Demchuk AM, Sacco RL, Saver JL, Warach S, Diener HC, Diehl A; PRoFESS Imaging Substudy Group. Stroke. 2012;43(9):(2336-42)



Neurology - Faculty Member, Title , Authors, Citation

Dr. Andrew Demchuk *Time dependence of reliability of noncontrast computed tomography in comparison to computed tomography angiography source image in acute ischemic stroke.* Bal S, Bhatia R, Menon BK, Shobha N, Puetz V, Dzialowski I, Modi J, Goyal M, Hill MD, Smith EE, Demchuk AM. International Journal of Stroke. 2012;():()

Dr. Andrew Demchuk *Longitudinal Evaluation of Resting-State fMRI After Acute Stroke with Hemiparesis.* Golestani AM, Tymchuk S, Demchuk A, Goodyear BG; VISION-2 Study Group. Neurorehabil Neural Repair. 2013;27(2):(1543-163)

Dr. Andrew Demchuk *Combined full-dose IV and endovascular thrombolysis in acute ischaemic stroke.* Bhatia R, Shobha N, Menon BK, Bal SP, Kochar P, Palumbo V, Wong JH, Morrish WF, Hudon ME, Hu W, Coutts SB, Barber PA, Watson T, Goyal M, Demchuk AM, Hill MD. Int J Stroke. 2012;():()

Dr. Andrew Demchuk *The iScore Predicts Efficacy and Risk of Bleeding in the NINDStroke t-PActivator Stroke Trial.* Saposnik G, Demchuk A, Tu JV, Johnston SC; Stroke Outcomes Research Canada (SORCan)Working Group. Cereb Dis.. 2012;():()

Dr. Andrew Demchuk *The Alberta Stroke Prevention in TIAs and mild strokes (ASPIRE) intervention: rationale and design for evaluating the implementation of a province-wide TLA Triaging system.* Jeerakathil T, Shuaib A, Majumdar SR, Demchuk AM, Butcher KS, Watson TJ, Dean N, Gordon D, Edmond C, Coutts SB; ASPIRE Investigators. Int J Stroke. 2012;():()

Dr. Andrew Demchuk *Ultrashort imaging to reperfusion time interval arrests core expansion in endovascular therapy for acute ischemic stroke.* Almekhlafi MA, Eesa M, Menon BK, Demchuk AM, Goyal M. J Neurointerv Surg. 2012;():()

Dr. Andrew Demchuk *Assessment of leptomeningeal collaterals using dynamic CT angiography in patients with acute ischemic stroke.* Menon BK, O'Brien B, Bivard A, Spratt NJ, Demchuk AM, Miteff F, Lu X, Levi C, Parson MW. J Cereb Blood Flow Metab. 2013;33(3):(365-71)

Dr. Andrew Demchuk *Safety and efficacy of NA-1 in patients with iatrogenic stroke after endovascular aneurysm repair (ENACT): a phase 2, randomised, double-blind, placebo-controlled trial.* Hill MD, Martin RH, Mikulis D, Wong JH, Silver FL, terBrugge KG, Milot G, Clark WM, MacDonald RL, Kelly ME, Bouton M, Fleetwood I, McDougall C, Gunnarsson T, Chow M, Lum C, Dodd R, Poub Blanc J, Krings T, Demchuk AM, Goyal M, Anderson R, Bishop J, Garman D, Tymianski M; for the ENACT trial investigators Lancet Neurology. 2012;11(11):(942-950)

Dr. Andrew Demchuk *Measurement of Length in Hyperdense MCA Sign in Acute Ischemic Stroke Predicts Disappearance after IV tPA.* Shobha N, Bal S, Boyko M, Kroshus E, Menon BK, Bhatia R, Sohn SI, Kumarpillai G, Kosior J, Hill MD, Demchuk AM. J Neuroimaging. 2013;():()

Dr. Andrew Demchuk *Endovascular Therapy after Intravenous t-PA versus t-PA Alone for Stroke.* Broderick JP, Palesch YY, Demchuk AM, Yeatts SD, Khatri P, Hill MD, Jauch EC, Jovin TG, Yan B, Silver FL, von Kummer R, Molina CA, Demaerschalk BM, Budzik R, Clark WM, Zaidat OO, Malisch TW, Goyal M, Schonewille WJ, Mazighi M, Engelter ST, Anderson C, Spilker J, Car-rozzella J, RTR, Ryckborst KJ, Janis LS, Martin RH, Foster LD, Tomsick TA: the Interventional Management of Stroke (IMS) III Investigators. N Engl J Med. 2013;368(10):(893-903)

Dr. Andrew Demchuk *Leptomeningeal collaterals are associated with modifiable metabolic risk factors.* Menon BK, Smith EE, Coutts SB, Welsh DG, Faber JE, Goyal M, Hill MD, Demchuk AM, Damani Z, Cho KH, Chang HW, Hong JH, Sohn SI. Ann Neurol.. 2013;():()

Dr. Andrew Demchuk *Malignant Emboli on Transcranial Doppler During Carotid Stenting Predict Postprocedure Diffusion-Weighted Imaging Lesions.* Almekhlafi MA, Demchuk AM, Mishra S, Bal S, Menon BK, Wiebe S, Clement FM, Wong JH, Hill MD, Goyal M. Stroke. 2013;():()

Dr. Andrew Demchuk *Spot Sign Number is the Most Important Spot Sign Characteristic for Predicting Hematoma Expansion Using First-Pass Computed Tomography Angiography: Analysis From the PREDICT Study.* Huynh TJ, Demchuk AM, Dow-latshahi D, Gladstone DJ, Krischek O, Kiss A, Hill MD, Molina CA, Rodriguez-Luna D, Dzialowski I, Silva Y, Czlonkowska A, Lum C, Boulanger JM, Gubitz G, Bhatia R, Padma V, Roy J, Kase CS, Aviv RI; PREDICT/Sunnybrook ICH CTA Study Group. Stroke. 2013;44(4):(972-7)

Dr. Andrew Demchuk *The ICV Sign as a marker of increased cerebral blood transit time.* Menon BK, Bai HD, Modi J, Dem-chuk AM, Hudon M, Goyal M, Watson TWJ. Can J Neurol Sci.. 2013;40(2):(187-91)

Neurology - Faculty Member, Title , Authors, Citation

Dr. Andrew Demchuk *The intracerebral hemorrhage acutely decreasing arterial pressure trial.* Butcher KS, Jeerakathil T, Hill M, Demchuk AM, Dowlatshahi D, Coutts SB, Gould B, McCourt R, Asdaghi N. Findlay JM, Emery D, Stroke. 2013;44(3):(620-6)

Dr. Paolo Federico *Near-infrared spectroscopy shows preictal haemodynamic changes in temporal lobe epilepsy.* Slone E, Westwood E, Dhaliwal H, Federico P, Dunn JF Epileptic Disord. 2012;14(4):(371-8)

Dr. Paolo Federico *Feasibility of an intracranial EEG-fMRI protocol at 3T: risk assessment and image quality.* Boucousis SM, Beers CA, Cunningham CJ, Gaxiola-Valdez I, Pittman DJ, Goodyear BG, Federico P Neuroimage. 2012;63(3):(1237-48)

Dr. Paolo Federico *Intracranial EEG-fMRI analysis of focal epileptiform discharges in humans.* Cunningham CB, Goodyear BG, Badawy R, Zaamout F, Pittman DJ, Beers CA, Federico P Epilepsia. 2012;53(9):(1636-48)

Dr. Paolo Federico *Discontinuation of antiepileptic drugs after successful epilepsy surgery. a Canadian survey.* Téllez-Zente-no JF, Ronquillo LH, Jette N, Burneo JG, Nguyen DK, Donner EJ, Sadler M, Javidan M M, Gross DW, Wiebe S, Canadian Epilepsy Surgery Study Group Epilepsy Res. 2012;102(1-2):(23-33)

Dr. Michael Hill *Carotid Angioplasty and Stenting Is Safe in Women.* Shobha N, Almekhlafi MA, Pandya A, Couillard PL, Mor-ish WF, Wong JH, Hill MD Can Assoc Radiol J. 2012;():()

Dr. Michael Hill *Safety and efficacy of NA-1 in patients with iatrogenic stroke after endovascular aneurysm repair (ENACT): a phase 2, randomised, double-blind, placebo-controlled trial.* Hill MD, Martin RH, Mikulis D, Wong JH, Silver FL, Terbrugge KG, Milot G, Clark WM, Macdonald RL, Kelly ME, Boulton M, Fleetwood I, McDougall C, Gunnarsson T, Chow M, Lum C, Dodd R, Poub blanc J, Krings T, Demchuk AM, Goyal M, Anderson R, Bishop J, Garman D, Tymianski M, ENACT trial investigators Lancet Neurol. 2012;11(11):(942-50)

Dr. Michael Hill *Ultrasound guided V3 segment vertebral artery direct percutaneous puncture for basilar artery mechani-cal thrombectomy in acute stroke: a technical report.* Desai JA, Almekhlafi MA, Hill MD, Goyal M, Eesa M BMJ Case Rep. 2013;2013():()

Dr. Michael Hill *Malignant Emboli on Transcranial Doppler During Carotid Stenting Predict Postprocedure Diffusion-Weighted Imaging Lesions.* Almekhlafi MA, Demchuk AM, Mishra S, Bal S, Menon BK, Wiebe S, Clement FM, Wong JH, Hill MD, Goyal M Stroke. 2013;():()

Dr. Michael Hill *Closure of patent foramen ovale versus medical therapy after cryptogenic stroke.* Carroll JD, Saver JL, Thaler DE, Smalling RW, Berry S, MacDonald LA, Marks DS, Tirschwell DL, RESPECT Investigators N Engl J Med. 2013;368(12):(1092-100)

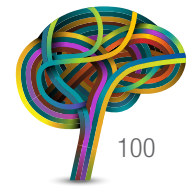
Dr. Michael Hill *Why calls for more routine carotid stenting are currently inappropriate: an international, multispecialty, expert review and position statement.* Abbott AL, Adelman MA, Alexandrov AV, Barber PA, Barnett HJ, Beard J, Bell P, Björck M, Blacker D, Bonati LH, Brown MM, Buckley CJ, Cambria RP, Castaldo JE, Comerota AJ, Connolly ES Jr, Dalman RL, Davies AH, Eckstein HH, Faruqi R, Feasby TE, Fraedrich G, Gloviczki P, Hankey GJ, Harbaugh RE, Heldenberg E, Hennerici MG, Hill MD, Kleinig TJ, Mikhailidis DP, Moore WS, Naylor R, Nicolaidis A, Paraskevas KI, Pelz DM, Prichard JW, Purdie G, Ricco JB, Ringleb PA, Riles T, Rothwell PM, Sandercock P, Sillesen H, Spence JD, Spinelli F, Sturm J, Tan A, Thapar A, Veith FJ, Wijeratne T, Zhou W Stroke. 2013;44(4):(1186-90)

Dr. Michael Hill *Stroke After Carotid Stenting and Endarterectomy in the Carotid Revascularization Endarterectomy Versus Stenting Trial (CREST).* Hill MD, Brooks W, Mackey A, CREST Investigators J Vasc Surg. 2013;57(3):(894)

Dr. Michael Hill *Outcomes Among 3.5 Million Newly Diagnosed Hypertensive Canadians.* Quan H, Chen G, Tu K, Bartlett G, Butt DA, Campbell NR, Hemmelgarn BR, Hill MD, Johansen H, Khan N, Lix LM, Smith M, Svenson L, Walker RL, Wielgosz A, McAlister FA, Hypertension Outcome and Surveillance Team Can J Cardiol. 2013;():()

Dr. Michael Hill *The brain-in-motion study: effect of a 6-month aerobic exercise intervention on cerebrovascular regulation and cognitive function in older adults.* Tyndall AV, Davenport MH, Wilson BJ, Burek GM, Arsenault-Lapierre G, Haley E, Eskes GA, Friedenreich CM, Hill MD, Hogan DB, Longman RS, Anderson TJ, Leigh R, Smith EE, Poulin MJ BMC Geriatr. 2013;13():(21)

Dr. Michael Hill *Spot Sign Number Is the Most Important Spot Sign Characteristic for Predicting Hematoma Expansion Us-ing First-Pass Computed Tomography Angiography: Analysis From the PREDICT Study.* Huynh TJ, Demchuk AM, Dowlatshahi D, Gladstone DJ, Krischek O, Kiss A, Hill MD, Molina CA, Rodriguez-Luna D, Dzialowski I, Silva Y, Czlonkowska A, Lum C, Boulanger JM, Gubitz G, Bhatia R, Padma V, Roy J, Kase CS, Aviv RI, PREDICT/Sunnybrook ICH CTA Study Group Stroke. 2013;44(4):(972-7)



Neurology - Faculty Member, Title , Authors, Citation

Dr. Michael Hill *Incidence, cardiovascular complications and mortality of hypertension by sex and ethnicity.* Quan H, Chen G, Walker RL, Wielgosz A, Dai S, Tu K, Campbell NR, Hemmelgarn BR, Hill MD, Johansen H, McAlister FA, Khan N, for Hypertension Outcome and Surveillance Team Heart. 2013;():()

Dr. Michael Hill *The intracerebral hemorrhage acutely decreasing arterial pressure trial.* Butcher KS, Jeerakathil T, Hill M, Demchuk AM, Dowlatshahi D, Coutts SB, Gould B, McCourt R, Asdaghi N, Findlay JM, Emery D, Shuaib A, ICH ADAPT Investigators Stroke. 2013;44(3):(620-6)

Dr. Michael Hill *Endovascular therapy after intravenous t-PA versus t-PA alone for stroke.* Broderick JP, Palesch YY, Demchuk AM, Yeatts SD, Khatrri P, Hill MD, Jauch EC, Jovin TG, Yan B, Silver FL, von Kummer R, Molina CA, Demaerschalk BM, Budzik R, Clark WM, Zaidat OO, Malisch TW, Goyal M, Schonewille WJ, Mazighi M, Engelter ST, Anderson C, Spilker J, Carrozzella J, Ryckborst KJ, Janis LS, Martin RH, Foster LD, Tomsick TA, Interventional Management of Stroke (IMS) III Investigators N Engl J Med. 2013;368(10):(893-903)

Dr. Michael Hill *Measurement of Length of Hyperdense MCA Sign in Acute Ischemic Stroke Predicts Disappearance after IV tPA.* Shobha N, Bal S, Boyko M, Kroshus E, Menon BK, Bhatia R, Sohn SI, Kumarpillai G, Kosior J, Hill MD, Demchuk AM J Neuroimaging. 2013;():()

Dr. Michael Hill *Benign post-partum reversible restricted diffusion lesion of the splenium.* Curtis R, Winder T, Scott J, Hill MD Can J Neurol Sci. 2013;40(1):(89-90)

Dr. Michael Hill *Tissue Window in Stroke Thrombolysis study (TWIST): a safety study.* Hill MD, Kenney C, Dzialowski I, Boulanger JM, Demchuk AM, Barber PA, Watson TW, Weir NU, Buchan AM, Calgary Stroke Program Can J Neurol Sci. 2013;40(1):(17-20)

Dr. Michael Hill *Do lacunar strokes benefit from thrombolysis? Evidence from the Registry of the Canadian Stroke Network.* Shobha N, Fang J, Hill MD Int J Stroke. 2012;():()

Dr. Michael Hill *Stroke after carotid stenting and endarterectomy in the Carotid Revascularization Endarterectomy versus Stenting Trial (CREST).* Hill MD, Brooks W, Mackey A, Clark WM, Meschia JF, Morrish WF, Mohr JP, Rhodes JD, Popma JJ, Lal BK, Longbottom ME, Voeks JH, Howard G, Brott TG, CREST Investigators Circulation. 2012;126(25):(3054-61)

Dr. Michael Hill *Impact of disability status on ischemic stroke costs in Canada in the first year.* Mittmann N, Seung SJ, Hill MD, Phillips SJ, Hachinski V, Côté R, Buck BH, Mackey A, Gladstone DJ, Howse DC, Shuaib A, Sharma M Can J Neurol Sci. 2012;39(6):(793-800)

Dr. Michael Hill *Combined full-dose IV and endovascular thrombolysis in acute ischaemic stroke.* Bhatia R, Shobha N, Menon BK, Bal SP, Kochar P, Palumbo V, Wong JH, Morrish WF, Hudon ME, Hu W, Coutts SB, Barber PA, Watson T, Goyal M, Demchuk AM, Hill MD nt J Stroke. 2012;():()

Dr. Michael Hill *Time dependence of reliability of noncontrast computed tomography in comparison to computed tomography angiography source image in acute ischemic stroke.* Bal S, Bhatia R, Menon BK, Shobha N, Puetz V, Dzialowski I, Modi J, Goyal M, Hill MD, Smith EE, Demchuk AM Int J Stroke. 2012;():()

Dr. Michael Hill *Neighborhood income and stroke care and outcomes.* Kapral MK, Fang J, Chan C, Alter DA, Bronskill SE, Hill MD, Manuel DG, Tu JV, Anderson GM Neurology. 2012;79(12):(1200-7)

Dr. Michael Hill *Routine CT angiography in acute stroke does not delay thrombolytic therapy.* Bal S, Menon BK, Demchuk AM, Hill MD Can J Neurol Sci. 2012;39(4):(499-501)

Dr. Michael Hill *Cost avoidance associated with optimal stroke care in Canada.* Krueger H, Lindsay P, Cote R, Kapral MK, Kaczorowski J, Hill MD Stroke. 2012;43(8):(2198-206)

Dr. Michael Hill *Planimetric hematoma measurement in patients with intraventricular hemorrhage: is total volume a preferred target for reliable analysis?* Dowlatshahi D, Kosior JC, Idris S, Eesa M, Dickhoff P, Joshi M, Subramaniam S, Tymchuk S, Hill MD, Aviv RI, Frayne R, Demchuk AM, PREDICT/Sunnybrook ICH-CTA study group Stroke. 2012;43(7):(1961-3)

Neurology - Faculty Member, Title , Authors, Citation

Dr. Michael Hill *Autoregulation of Cerebral Blood Flow Is Preserved in Primary Intracerebral Hemorrhage.* Gould B, McCourt R, Asdaghi N, Dowlatshahi D, Jeerakathil T, Kate M, Coutts SB, Hill MD, Demchuk AM, Shuaib A, Emery D, Butcher K, on behalf of the ICH ADAPT investigators Stroke. 2013;():()

Dr. Michael Hill *Review: A dichotomized ABCD2 score has limited ability to predict stroke risk ? 90 days after TIA.* Hill MD Ann Intern Med. 2013;158(8):(JC12)

Dr. Michael Hill *Ultrasound guided V3 segment vertebral artery direct percutaneous puncture for basilar artery mechanical thrombectomy in acute stroke: a technical report.* Desai JA, Almekhlafi MA, Hill MD, Goyal M, Eesa M J Neurointerv Surg. 2013;():()

Dr. Michael Hill *The 2013 canadian hypertension education program recommendations for blood pressure measurement, diagnosis, assessment of risk, prevention, and treatment of hypertension.* Hackam DG, Quinn RR, Ravani P, Rabi DM, Dasgupta K, Daskalopoulou SS, Khan NA, Herman RJ, Bacon SL, Cloutier L, Dawes M, Rabkin SW, Gilbert RE, Ruzicka M, McKay DW, Campbell TS, Grover S, Honos G, Schiffrin EL, Bolli P, Wilson TW, Feldman RD, Lindsay P, Hill MD, Gelfer M, Burns KD, Vallée M, Prasad GV, Lebel M, McLean D, Arnold JM, Moe GW, Howlett JG, Boulanger JM, Larochelle P, Leiter LA, Jones C, Ogilvie RI, Woo V, Kaczorowski J, Trudeau L, Petrella RJ, Milot A, Stone JA, Drouin D, Lavoie KL, Lamarre-Cliche M, Godwin M, Tremblay G, Hamet P, Fodor G, Carruthers SG, Pylypchuk GB, Burgess E, Lewanczuk R, Dresser GK, Penner SB, Hegele RA, McFarlane PA, Sharma M, Reid DJ, Tobe SW, Poirier L, Padwal RS, Canadian Hypertension Education Program Can J Cardiol. 2013;29(5):(528-42)

Dr. Nathalie Jetté *Experience and satisfaction of staff working in a seizure monitoring unit.* Sauro KM, Krassman C, Jetté N, Knox J, Suddes M, Mercer E, Rigby M, Wiebe S, Pillay N, Federico P, Murphy W and Macrodimitris S. Can J Neurosci Nurs . 2012;34(2):(33-38)

Dr. Nathalie Jetté *Neurological registry feasibility and sustainability.* Pringsheim T, Marrie RA, Donner E, Shevell M, Lam D, Day L, Johnston M, Jette and Korngut. Canadian Journal of Neurological Sciences. 2013;(in press)():()

Dr. Nathalie Jetté *Systematic review and meta-analysis of standard vs selective temporal lobe epilepsy surgery.* Josephson CB, Dykeman J, Fiest KM, Liu X, Sadler RM, Jette N, Wiebe S Neurology. 2013;(in press)():()

Dr. Nathalie Jetté *Complications of epilepsy surgery-a systematic review of focal surgical resections and invasive EEG monitoring.* Hader WJ, Tellez-Zenteno J, Metcalfe A, Hernandez-Ronquillo L, Wiebe S, Kwon CS, Jette N Epilepsia. 2013;(in press)():()

Dr. Nathalie Jetté *Quality of Care for First Nations and Non-First Nations People with Diabetes.* Deved V, Jette N, Quan H, Tonelli M, Manns B, Soo A, Barnabe C, Hemmelgarn BR, for the Alberta Kidney Disease Network Clin J Am Soc Nephrol. 2013;(in press)():()

Dr. Nathalie Jetté *Update on the surgical treatment of epilepsy.* Jette N, Wiebe S Curr Opin Neurol. 2013;26(2):(201-7)

Dr. Nathalie Jetté *American Clinical Neurophysiology Society's Standardized Critical Care EEG Terminology: 2012 version.* Hirsch LJ, LaRoche SM, Gaspard N, Gerard E, Svoronos A, Herman ST, Mani R, Arif H, Jette N, Minazad Y, Kerrigan JF, Vespa P, Hantus S, Claassen J, Young GB, So E, Kaplan PW, Nuwer MR, Fountain NB, Drislane FW J Clin Neurophysiol. 2013;30(1):(1-27)

Dr. Nathalie Jetté *An update on the prevalence of cerebral palsy: a systematic review and meta-analysis.* Oskoui M, Coutinho F, Dykeman J, Jetté N, Pringsheim T Dev Med Child Neurol. 2013;(in press)():()

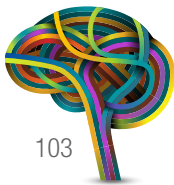
Dr. Nathalie Jetté *Depression in epilepsy: a systematic review and meta-analysis.* Fiest KM, Dykeman J, Patten SB, Wiebe S, Kaplan GG, Maxwell CJ, Bulloch AG, Jette N Neurology. 2013;80(6):(590-9)

Dr. Nathalie Jetté *The prevalence of primary dystonia: a systematic review and meta-analysis.* Steeves TD, Day L, Dykeman J, Jette N, Pringsheim T Mov Disord. 2012;27(14):(1789-96)

Dr. Nathalie Jetté *Applying evidence to patient care: From population health to individual patient values.* Jette N, Choi H, Wiebe S Epilepsy Behav. 2013;26(3):(234-40)

Dr. Nathalie Jetté *Generalized periodic discharges: more light shed on the old “GPEDs”.* Jette N, Moseley BD Neurology. 2012;79(19):(1940-1)

Dr. NathalieJetté *A comparison of antiepileptic drug therapy in patients with severe intellectual disability and patients with normal intellect.* Fridhandler JD, Coelho FM, Tai P, Jette N, Andrade DM Epilepsy Behav. 2012;25(2):(196-9)



Neurology - Faculty Member, Title , Authors, Citation

Dr. Nathalie Jetté *Pharmacoresistance and the role of surgery in difficult to treat epilepsy.* Wiebe S, Jette N Nat Rev Neurol. 2012;8(12):(669-77)

Dr. Nathalie Jetté *Recommendations for optimal ICD codes to study neurologic conditions: a systematic review.* St Germaine-Smith C, Metcalfe A, Pringsheim T, Roberts JI, Beck CA, Hemmelgarn BR, McChesney J, Quan H, Jette N Neurology. 2012;79(10):(1049-55)

Dr. Nathalie Jetté *Development of an online tool to determine appropriateness for an epilepsy surgery evaluation.* Jette N, Quan H, Tellez-Zenteno JF, Macrodimitris S, Hader WJ, Sherman EM, Hamiwka LD, Wirrell EC, Burneo JG, Metcalfe A, Faris PD, Hernandez-Ronquillo L, Kwon CS, Kirk A, Wiebe S, CASES Expert Panelists Neurology. 2012;79(11):(1084-93)

Dr. Nathalie Jetté *Prevalence of tic disorders: a systematic review and meta-analysis.* Knight T, Steeves T, Day L, Lowerison M, Jette N, Pringsheim T Pediatr Neurol. 2012;47(2):(77-90)

Dr. Nathalie Jetté *Case definitions for acute myocardial infarction in administrative databases and their impact on in-hospital mortality rates.* Metcalfe A, Neudam A, Forde S, Liu M, Drosler S, Quan H, Jetté N Health Serv Res. 2013;48(1):(290-318)

Dr. Nathalie Jetté *Development and validation of a case definition for epilepsy for use with administrative health data.* Reid AY, St Germaine-Smith C, Liu M, Sadiq S, Quan H, Wiebe S, Faris P, Dean S, Jetté N Epilepsy Res. 2012;102(3):(173-9)

Dr. Nathalie Jetté *The incidence and prevalence of Huntington's disease: a systematic review and meta-analysis.* Pringsheim T, Wiltshire K, Day L, Dykeman J, Steeves T, Jette N Mov Disord. 2012;27(9):(1083-91)

Dr. Nathalie Jetté *Discontinuation of antiepileptic drugs after successful epilepsy surgery. a Canadian survey.* Téllez-Zenteno JF, Ronquillo LH, Jette N, Burneo JG, Nguyen DK, Donner EJ, Sadler M, Javidan M M, Gross DW, Wiebe S, Canadian Epilepsy Surgery Study Group Epilepsy Res. 2012;102(1-2):(23-33)

Dr. Marcus Koch *Lack of association between serum uric acid levels and outcome in acute ischemic stroke* Miedema I, Uyttenboogaart M, Koch M, Kremer B, de Keyser J, Luijckx GJ. J Neurol Sci. 2012;():()

Dr. Marcus Koch *Incidence and prevalence of multiple sclerosis in the americas: a systematic review.* Evans C, Beland SG, Kulaga S, Wolfson C, Kingwell E, Marriott J, Koch M, Makhani N, Morrow S, Fisk J, Dykeman J, Jetté N, Pringsheim T, Marrie RA. Neuroepidemiology. 2013;():()

Dr. Marcus Koch *Cerebral white matter blood flow and energy metabolism in multiple sclerosis.* Steen C, D'haeseleer M, Hoogduin JM, Fierens Y, Cambron M, Mostert JP, Heersema DJ, Koch MW, De Keyser J. Mult Scler. 2013;():()

Dr. Marcus Koch *Performance on Paced Auditory Serial Addition Test and cerebral blood flow in multiple sclerosis.* D'haeseleer M, Steen C, Hoogduin JM, van Osch MJ, Fierens Y, Cambron M, Koch MW, De Keyser J. Acta Neurol Scand. 2013;():()

Dr. Lawrence Korngut *Amyloid myoneuropathy mimicking inclusion body myositis.* Abuzinidah A, Joseph J, Korngut L. 9 Canadian Journal of Neurological Sciences 2013;40(2):255-8.

Dr. Lawrence Korngut *Establishing a Canadian Registry of Patients with Amyotrophic Lateral Sclerosis.* Korngut L, Genge A, Johnston M, Benstead T, Bourque P, Briemberg H, Casey A, D'Amour M,Dupré N, Figlewicz D, Hader W, Johnston W, Kalra S, Melanson M, O'Connell C, Rouleau G, Shoesmith C, Wee J, Zinman L.

Dr. Lawrence Korngut *An Enriched Enrollment, Randomized Withdrawal, Flexible Dose, Double Blind, Placebo Controlled, Parallel Assignment Efficacy Study of Nabilone as Adjuvant in the Treatment of Diabetic Peripheral Neuropathic Pain.* Toth C, Mawani S, Brady S, Chan C, Liu C, Mehina E, Garven A, Bestard J, Korngut L . Pain. 2012 Oct;153(10):2073-82.

Dr. Bijoy Menon *Measurement of Length of Hyperdense MCA Sign in Acute Ischemic Stroke Predicts Disappearance after IV tPA.* Shobha N, Bal S, Boyko M, Kroshus E, Menon BK, Bhatia R, Sohn SI, Kumarpillai G, Kosior J, Hill MD, Demchuk AM J Neuroimaging. 2013;():()

Dr. Bijoy Menon *Perfusion imaging in acute ischemic stroke: let us improve the science before changing clinical practice.* Goyal M, Menon BK, Derdeyn CP Radiology. 2013;266(1):(16-21)

Dr. Bijoy Menon *Combined full-dose IV and endovascular thrombolysis in acute ischaemic stroke.* Bhatia R, Shobha N, Menon BK, Bal SP, Kochar P, Palumbo V, Wong JH, Morrish WF, Hudon ME, Hu W, Coutts SB, Barber PA, Watson T, Goyal M, Demchuk AM, Hill MD Int J Stroke. 2012;():()

Neurology - Faculty Member, Title , Authors, Citation

Dr. Bijoy Menon *Imaging-based selection in acute ischemic stroke trials - a quest for imaging sweet spots.* Demchuk AM, Menon B, Goyal M Ann N Y Acad Sci. 2012;1268():(63-71)

Dr. Bijoy Menon *Risk score for intracranial hemorrhage in patients with acute ischemic stroke treated with intravenous tissue-type plasminogen activator.* Menon BK, Saver JL, Prabhakaran S, Reeves M, Liang L, Olson DM, Peterson ED, Hernandez AF, Fonarow GC, Schwamm LH, Smith EE Stroke. 2012;43(9):(2293-9)

Dr. Luanne Metz *Evaluation of the 9-item Patient Health Questionnaire (PHQ-9) as an assessment instrument for symptoms of depression in patients with multiple sclerosis.* Sjonnesen K, Berzins S, Fiest KM, M Bulloch AG, Metz LM, Thombs BD, Patten SB. Postgraduate Medical Journal. 2012;124(5):(69-77)

Dr. Luanne Metz *Disability in a community population with MS with and without mental disorders.* Patten SB, Williams JVA, Lavorato DH, Metz LM, Bulloch AGM. International Journal of Psychiatry in Medicine. 2012;43(1):(51-65)

Dr. Luanne Metz *Long-term follow-up of a phase 2 study of oral teriflunomide in relapsing multiple sclerosis: safety and efficacy results up to 8.5 years.* Confavreux C, Li DK, Freedman MS, Truffinet P, Benzerdjeb H, Wang D, Bar-Or A, Traboulsee AL, Reiman LE, O'Connor PW, Teriflunomide Multiple Sclerosis Trial Group Mult Scler. 2012;18(9):(1278-89)

Dr. Tamara Pringsheim *Des recommandations probantes pour surveiller l'innocuite des antipsychotiques de deuxieme generation chez less enfants et les adolescents.* Pringsheim T, Panagiotopoulos C, Davidson J, Ho J. Pediatrics and Child Health. 2012;2012(Supplement B):(12B-21B)

Dr. David Patry *Utility of the Canadian Treatment Optimization Recommendations (TOR) in MS care* Grand Maison F, Bhan V, Freedman MS, Myles ML, Patry DG, Selchen DH, Moriarty P, Traboulsee AL. Can J Neurol Sci. 2013 Jul;40(4):527-35.

Dr. Neelan Pillay *Magnetic resonance imaging of crossed cerebellar diaschisis and bright pulvinar in status epilepticus.* Neurosciences (Riyadh). Al-Jafen BN, Alanazy MH, Scott JN, Pillay N Neurosciences (Riyadh). 2012 Jul;17(3):259-61

Dr. Neelan Pillay *Adjunctive perampanel for refractory partial-onset seizures: Randomized phase III study 304.* French JA, Krauss GL, Biton V, Squillacote D, Yang H, Laurenza A, Kumar D, Rogawski MA and Pillay N. Neurology. 2012 Aug 7;79(6):589-96.

Dr. Tamara Pringsheim *Les recommandations therapeutiques relatives aux effets secondaires extrapyramidaux associes a l'utilisation d'antipsychotiques de deuxieme generation chez les enfants et les adolescents.* Pringsheim T, Doja A, Belanger S, Patten S. Pediatrics and Child Health. 2012;2012(Supplement B):(22B-30B)

Dr. Tamara Pringsheim *The Pharmacoepidemiology of Selective Serotonin Reuptake Inhibitors for Children and Adolescents in Canada from 2005 to 2009: A Database Analysis.* Lam D, Gorman DA, Patten S, Pringsheim T Paediatr Drugs. 2013;():()

Dr. Tamara Pringsheim *Incidence and Prevalence of Multiple Sclerosis in the Americas: A Systematic Review.* Evans C, Beland SG, Kulaga S, Wolfson C, Kingwell E, Marriott J, Koch M, Makhani N, Morrow S, Fisk J, Dykeman J, Jetté N, Pringsheim T, Marrie RA Neuroepidemiology. 2013;40(3):(195-210)

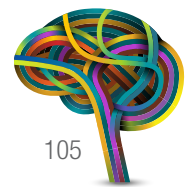
Dr. Tamara Pringsheim *Second-generation antipsychotics for the treatment of disruptive behaviour disorders in children: a systematic review.* Pringsheim T, Gorman D Can J Psychiatry. 2012;57(12):(722-7)

Dr. Tamara Pringsheim *Psychopharmacology for the clinician: management of comorbid Tourette syndrome and attention-deficit/hyperactivity disorder: are psychostimulants an option?* Pringsheim T J Psychiatry Neurosci. 2012;37(6):(432)

Dr. Tamara Pringsheim *The incidence and prevalence of Huntington's disease: a systematic review and meta-analysis.* Pringsheim T, Wiltshire K, Day L, Dykeman J, Steeves T, Jette N Mov Disord. 2012;27(9):(1083-91)

Dr. Eric Smith *Times From Symptom Onset to Hospital Arrival in the Get With The Guidelines-Stroke Program 2002 to 2009: Temporal Trends and Implications.* Tong D, Reeves MJ, Hernandez AF, Zhao X, Olson DM, Fonarow GC, Schwamm LH, Smith EE Stroke. 2012;():()

Dr. Eric Smith *Insurance Status and Outcome after Intracerebral Hemorrhage: Findings from Get with The Guidelines-Stroke.* James ML, Grau-Sepulveda MV, Olson DM, Smith EE, Hernandez AF, Peterson ED, Schwamm LH, Bhatt DL, Fonarow GC J Stroke Cerebrovasc Dis. 2013;():()



Neurology - Faculty Member, Title , Authors, Citation

Dr. Eric Smith *A risk score for in-hospital death in patients admitted with ischemic or hemorrhagic stroke.* Smith EE, Shobha N, Dai D, Olson DM, Reeves MJ, Saver JL, Hernandez AF, Peterson ED, Fonarow GC, Schwamm LH J Am Heart Assoc. 2013;2(1):(e005207)

Dr. Eric Smith *The brain-in-motion study: effect of a 6-month aerobic exercise intervention on cerebrovascular regulation and cognitive function in older adults.* Tyndall AV, Davenport MH, Wilson BJ, Burek GM, Arsenault-Lapierre G, Haley E, Eskes GA, Friedenreich CM, Hill MD, Hogan DB, Longman RS, Anderson TJ, Leigh R, Smith EE, Poulin MJ BMC Geriatr. 2013;13(0):(21)

Dr. Eric Smith *Clinical Policy: Use of intravenous tPA for the management of acute ischemic stroke in the emergency department.* American College of Emergency Physicians, American Academy of Neurology Ann Emerg Med. 2013;61(2):(225-43)

Dr. Eric Smith *Dysphagia Screening and Hospital-acquired Pneumonia in Patients with Acute Ischemic Stroke: Findings from Get with the Guidelines-Stroke.* Masrur S, Smith EE, Saver JL, Reeves MJ, Bhatt DL, Zhao X, Olson D, Pan W, Hernandez AF, Fonarow GC, Schwamm LH Stroke Cerebrovasc Dis. 2013;(0):()

Dr. Eric Smith *Venous Thromboembolism in the Get With The Guidelines-Stroke Acute Ischemic Stroke Population: Incidence and Patterns of Prophylaxis.* Douds GL, Hellkamp AS, Olson DM, Fonarow GC, Smith EE, Schwamm LH, Cockcroft KM J Stroke Cerebrovasc Dis. 2012;(0):()

Dr. Eric Smith *Patterns, predictors, variations, and temporal trends in emergency medical service hospital prenotification for acute ischemic stroke.* Lin CB, Peterson ED, Smith EE, Saver JL, Liang L, Xian Y, Olson DM, Shah BR, Hernandez AF, Schwamm LH, Fonarow GC J Am Heart Assoc. 2012;1(4):(e002345)

Dr. Eric Smith *Focal cortical thinning is caused by remote subcortical infarcts: spooky action at a distance.* Smith EE, Arboix A Neurology. 2012;79(20):(2016-7)

Dr. Eric Smith *Time dependence of reliability of noncontrast computed tomography in comparison to computed tomography angiography source image in acute ischemic stroke.* Bal S, Bhatia R, Menon BK, Shobha N, Puetz V, Dzialowski I, Modi J, Goyal M, Hill MD, Smith EE, Demchuk AM Int J Stroke. 2012;(0):()

Dr. Eric Smith *Assessing stroke patients for rehabilitation during the acute hospitalization: findings from the get with the guidelines-stroke program.* Prvu Bettger JA, Kaltenbach L, Reeves MJ, Smith EE, Fonarow GC, Schwamm LH, Peterson ED Arch Phys Med Rehabil. 2013;94(1):(38-45)

Dr. Eric Smith *Comparison of 30-day mortality models for profiling hospital performance in acute ischemic stroke with vs without adjustment for stroke severity.* Fonarow GC, Pan W, Saver JL, Smith EE, Reeves MJ, Broderick JP, Kleindorfer DO, Sacco RL, Olson DM, Hernandez AF, Peterson ED, Schwamm LH JAMA. 2012;308(3):(257-64)

Dr. Eric Smith *Door-to-needle times in acute ischemic stroke: how low can we go?* Smith EE, von Kummer R Neurology. 2012;79(4):(296-7)

Dr. Eric Smith *Regional variation in recommended treatments for ischemic stroke and TIA: Get with the Guidelines--Stroke 2003-2010.* Allen NB, Kaltenbach L, Goldstein LB, Olson DM, Smith EE, Peterson ED, Schwamm L, Lichtman JH Stroke. 2012;43(7):(1858-64)

Dr. Eric Smith *Lipid profile, lipid lowering medications, and symptomatic intracerebral hemorrhage after tPA in Get With The Guidelines-Stroke.* Messe SR, Pervez MA, Smith EE, Siddique KA, Hellkamp AS, Saver JL, Bhatt DL, Fonarow GC, Peterson E, Schwamm LH. Stroke. 2013;(0):()

Dr. Eric Smith *Trends in smoking cessation counseling: experience from “Get With The Guidelines”.* Hsuang P-H, Kim CX, Lerman A, Cannon CP, Dai D, Laskey W, Peacock WF, Hernandez AF, Peterson ED, Smith EE, Fonarow GC, Schwamm LH, Bhatt DL. Clinical Cardiology. 2012;35(7):(396-403)

Dr. Eric Smith *Emergency medical service hospital prenotification is associated with improved evaluation and treatment of acute ischemic stroke.* Lin CB, Peterson ED, Smith EE, Saver JL, Liang L, Xian Y, Olson DM, Shah BR, Hernandez AF, Schwamm LH, Fonarow GC. Circulation: Cardiovascular Quality and Outcomes. 2012;5(4):(514-522)

Dr. Eric Smith *Cavitation following acute symptomatic lacunar stroke depends on time, location and MRI sequence* Moreau F, Patel S, Lauzon ML, McCreary CR, Goyal M, Frayne R, Demchuk AM, Coutts SB, Smith EE. Stroke. 2012;43(7):(1837-1842)

Neurology - Faculty Member, Title , Authors, Citation

Dr. Eric Smith *Cerebral microinfarcts: enumerating the innumerable.* Smith EE, Biessel GJ Neurology. 2013;(0):()

Dr. Cory Toth *Insulin and the brain.* Derakhshan F, Toth C Curr Diabetes Rev. 2013;9(2):(102-16)

Dr. Cory Toth *Increased gait variability in diabetes mellitus patients with neuropathic pain.* Lalli P, Chan A, Garven A, Midha N, Chan C, Brady S, Block E, Hu B, Toth C J Diabetes Complications. 2012;(0):()

Dr. Cory Toth *An enriched-enrolment, randomized withdrawal, flexible-dose, double-blind, placebo-controlled, parallel assignment efficacy study of nabilone as adjuvant in the treatment of diabetic peripheral neuropathic pain.* Toth C, Mawani S, Brady S, Chan C, Liu C, Mehina E, Garven A, Bestard J, Korngut L Pain. 2012;153(10):(2073-82)

Dr. Cory Toth *A Randomized, Double-Blind, Placebo Controlled, Parallel Assignment, Flexible Dose, Efficacy Study of Nabilone as Adjuvant in the Treatment of Diabetic Peripheral Neuropathic Pain* Toth C, Mawani S, Brady S, Chan C, Liu C, Mehina E, Garven A, Bestard J, Korngut L Pain. 2012;153(10):(2073-82)

Dr. Cory Toth *Epidemiological hurdles for the determination of the prevalence of chronic pain with neuropathic features.* Toth C Pain Med. 2013;14(2):(177-9)

Dr. Cory Toth *A Randomized, Single-Blind, Controlled, Parallel Assignment Study of Exercise versus Education as Adjuvant in the Treatment of Peripheral Neuropathic Pain* Toth C, Brady S, Gagnon F, Wigglesworth K. CI J Pain. 2012;accepted for e-publication(0):()

Dr. Cory Toth *Association of Specific Comorbidities with increasing severity of peripheral neuropathy in diabetes mellitus* Sachedina S, Toth C. World J Diab. 2013;e-published online(0):()

Dr. Cory Toth *Progression in idiopathic, diabetic, paraproteinemic, alcoholic and B12 deficiency neuropathy* Sachedina S, Toth C. JPNS. 2013;accepted for e-publication(0):()

Dr. Cory Toth *Olfactory Dysfunction in Diabetes is Dependent upon Neuropathic Pain Presence* Brady S, Lalli P, Midha N, Chan A, Garven A, Midha N, Chan C, Toth C. Chemical Senses. 2012;accepted for e-publication(0):()

Dr. Cory Toth *Increased gait variability in diabetes mellitus patients with neuropathic pain* Lalli P, Chan A, Garven A, Midha N, Chan C, Brady S, Block E, Hu B, Toth C. J Diab Complications. 2012;e-published 2012 Dec 3(0):()

Dr. Samuel Wiebe *Discontinuation of antiepileptic drugs after successful epilepsy surgery. A Canadian survey.* Téllez-Zenteno JF, Ronquillo LH, Jette N, Burneo JG, Nguyen DK, Donner EJ, Sadler M, Javidan M M, Gross DW, Wiebe S, Canadian Epilepsy Surgery Study Group Epilepsy Res. 2012;102(1-2):(22-23)

Dr. Samuel Wiebe *Evidence-based guideline: Treatment of parenchymal neurocysticercosis: Report of the Guideline Development Subcommittee of the American Academy of Neurology.* Baird RA, Wiebe S, Zunt JR, Halperin JJ, Gronseth G, Roos KL Neurology. 2013;80(15):(1424-1429)

Dr. Samuel Wiebe *Systematic review and meta-analysis of standard vs selective temporal lobe epilepsy surgery.* Josephson CB, Dykeman J, Fiest KM, Liu X, Sadler RM, Jette N, Wiebe S Neurology. 2013;(0):()

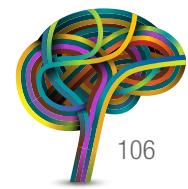
Dr. Samuel Wiebe *Malignant Emboli on Transcranial Doppler During Carotid Stenting Predict Postprocedure Diffusion-Weighted Imaging Lesions.* Almekhlafi MA, Demchuk AM, Mishra S, Bal S, Menon BK, Wiebe S, Clement FM, Wong JH, Hill MD, Goyal M Stroke. 2013;44(5):(1317-1322)

Dr. Samuel Wiebe *Big epilepsy surgery for little people: what's the full story on hemispherectomy?* Wiebe S, Berg AT Neurology. 2013;80(3):(232-3)

Dr. Samuel Wiebe *Quality of life in children with new-onset epilepsy: A 2-year prospective cohort study* Speechley KN, Ferro MA, Camfield CS, Huang W, Levin SD, Smith ML, Wiebe S, Zou G Neurology. 2012;79(15):(1548-1555)

Dr. Michael Yeung *Treatment optimization in MS: Canadian MS Working Group updated recommendations* Freedman MS, Selchen D, Arnold DL, Prat A, Banwell B, Yeung M, Morgenthau D, and Lapierre Can J Neurol Sci. 2013 May 40(3): 307-23

Dr. Michael Yeung *Magnetic resonance imaging outcomes from a phase III trial of teriflunomide.* Mult Scler. Wolinsky JS, Narayana PA, Nelson F, Datta S, O'Connor P, Confavreux C, Comi G, Kappos L, Olsson TP, Truffinet P, Wang L, Miller A, Freedman MS Mult Scler. 2013 Feb 27 [Epub ahead of print]



Neurology - Faculty Member, Title , Authors, Citation

Dr. Michael Yeung *Pre-specified subgroup analyses of a placebo-controlled phase III trial (TEMPO) of oral teriflunomide in relapsing multiple sclerosis.* Aaron E Miller, Paul O'Connor, Jerry S Wolinsky, Christian Confavreux, Ludwig Kappos, Tomas P Olsson, Philippe Truffinet, Lin Wang, Laura D'Castro, Giancarlo Comi, Mark S Freedman. Mult Scler, 2012 November 18(11):1625-1632

Dr. Douglas Zochodne *Overexpression of human HSP27 protects sensory neurons from diabetes.* Korngut L, Ma CH, Martinez JA, Toth CC, Guo GF, Singh V, Woolf CJ, Zochodne DW Neurobiol Dis. 2012;47(3):(436-43)

Dr. Douglas Zochodne *Peripheral axon regrowth: new molecular approaches.* Christie K, Zochodne D Neuroscience. 2013;(0):()

Dr. Douglas Zochodne *Brief transvertebral electrical stimulation of the spinal cord improves the specificity of femoral nerve reinnervation.* Franz CK, Singh B, Martinez JA, Zochodne DW, Midha R Neurorehabil Neural Repair. 2013;27(3):(260-8)

Dr. Douglas Zochodne *The challenges and beauty of peripheral nerve re-growth. Presidential Lecture, Peripheral Nerve Society.* Zochodne DW Journal of the Peripheral Nervous System 2012; 17: (1-18).

Neurosurgery - Faculty Member, Title, Authors, Citation

Dr. Steve Casha *Results of a phase II placebo-controlled randomized trial of minocycline in acute spinal cord injury.* Casha S, Zygun D, McGowan MD, Bains I, Yong VW, Hurlbert RJ. Brain 2012: 135;1224–1236 I 1224

Dr. Clare Gallagher *A Prospective Evaluation of the Temporal Matrix Metalloproteinase Response After Severe Traumatic Brain Injury in Humans* D.Roberts, C. Jenne, C. Léger, A. Kramer, C. Gallagher, S.Todd, I. Parney, C. Doig, V.Yong, P.Kubes, and D. Zygun, MD Journal of Neurotrauma. 2013;(0):()

Dr. Clare Gallagher *Association Between the Cerebral Inflammatory and Matrix Metalloproteinase Responses After Severe Traumatic Brain Injury in Humans* D. J. Roberts, C. N. Jenne, C. Léger,A. H. Kramer, C. N. Gallagher, S. Todd,,3 I. F. Parney, C. J. Doig, V. Wee Yong, P. Kubes, and D. Zygun, Journal of Neurotrauma. 2013;(0):()

Dr. Clare Gallagher *Lactate uptake by the injured brain: Evidence from an Arterio-venous gradient and cerebral micro dialysis study* I. Jalloh, A. Helmy, R. Shannon, C. Gallagher, D. Menon, K. Carpenter, P. Hutchinson Journal of Neurotrauma. 2013;(0):()

Dr. Walter Hader *Sustained response to weekly vinblastine in two children with pilomyxoid astrocytoma associated with diencephalic syndrome* Singh G, Wei XC, Hader W, Chan J, Bouffet E, Lafay-Cousin L. J of Pediatric Hematology and Oncology . 2013;35(2):(e53-6)

Dr. Walter Hader *Hemimegalencephaly: foetal tauopathy with M TOR hyperactivation and neuronal lipidosis* Sarnat H, Flores-Sarnat L, Crino P, Hader W, Bello-Espinosa L. Folia Neuropathology. 2012;(0):()

Dr. Walter Hader *Memory and Health-related Quality of life in severe pediatric epilepsy.* Hrabok M, Sherman E, Bello-Espinoza L, Hader W. Journal of Pediatrics. 2013;(0):()

Dr. Walter Hader *Presurgical language fMRI and postsurgical deficits: a single centre experience* Charmaine Wiens, Bradley G Goodyear, Ankur Goel1, Paolo Federico,Walter Hader, Mayank Goyal Canadian Journal of Neurological Sciences. 2013;(0):()

Dr. Mark Hamilton *Comparison of Infection Rate With the Use of Antibiotic-Impregnated vs Standard Extraventricular Drainage Devices: A Prospective, Randomized Controlled Trial.* Pople I, Poon W, Assaker R, Mathieu D, Iantosca M, Wang E, Zhang LW, Leung G, Chumas P, Menei P, Beydon L, Hamilton M, Kamaly I, Lewis S, Ning W, Megerian JT, McGirt MJ, Murphy JA, Michael A, Meling T Neurosurgery. 2012;71(1):(6-13)

Dr. Mark Hamilton *Treating brain tumor-initiating cells using a combination of myxoma virus and rapamycin.* Zemp FJ, Lun X, McKenzie BA, Zhou H, Maxwell L, Sun B, Kelly JJ, Stechishin O, Luchman A, Weiss S, Cairncross JG, Hamilton MG, Rabinovich BA, Rahman MM, Mohamed MR, Smallwood S, Senger DL, Bell J, McFadden G, Forsyth PA Neuro Oncol. 2013;(0):()

Dr. Mark Hamilton *Consensus definitions of complications for accurate recording and comparisons of surgical outcomes in pediatric neurosurgery.* Drake JM, Singhal A, Kulkarni AV, DeVeber G, Cochrane DD, Canadian Pediatric Neurosurgery Study Group J Neurosurg Pediatr. 2012;10(2):(89-95)

Neurosurgery - Faculty Member, Title, Authors, Citation

Dr. John Hurlbert *Treatment of Herniated Lumbar Disc by Sequestrectomy or Conventional Discectomy.* Shamji MF, Bains I, Yong E, Sutherland G, Hurlbert RJ World Neurosurg. 2013;(0):()

Dr. John Hurlbert *Oops, I Did It Again ...* Shamji MF, Hurlbert RJ World Neurosurg. 2012;(0):()

Dr. John Hurlbert *Comments.* Shamji MF, Hurlbert RJ, Wang MY, Wolfla C Neurosurgery. 2012;71(1):(36)

Dr. John Hurlbert *Intraoperative magnetic resonance imaging and neuronavigation for transoral approaches to upper cervical pathology.* Dhaliwal PP, Hurlbert RJ, Sutherland GS World Neurosurg. 2012;78(1-2):(164-9)

Dr. Bradley Jacobs *Surgical Management of Charcot Spinal Arthropathy: A Single Center Retrospective Series Highlighting the Evolution of Management* Jacobs WB, Bransford RJ, Bellabarba C, and Chapman JR Journal of Neurosurgery:Spine. 2012;17(5):(422 - 431)

Dr. John Kelly *An in vivo patient-derived model of endogenous IDH1-mutant glioma* Artee Luchman, Owen D. Stechishin, N. Ha Dang, Michael D. Blough, Charles Chesnelong, John J. Kelly, Stephanie A. Nguyen, Jennifer A. Chan, Aalim M. Weljie, J. Gregory Cairncross, and Samuel Weiss Neuro-oncology. 2012;14(2):(184-191)

Dr. John Kelly *On-target JAK2/STAT3 inhibition slows disease progression in orthotopic xenografts of human glioblastoma brain tumor stem cells* Stechishin OD, Luchman HA, Ruan Y, Blough MD, Nguyen SA, Kelly JJ, Cairncross JG, Weiss S. Neuro Oncol. 2013;Feb 15(2):(198-207)

Dr. Zelma Kiss *Double-blind optimization of subcallosal cingulate deep brain stimulation for treatment-resistant depression: a pilot study.* Ramasubbu R, Anderson S, Haffenden A, Chavda S, Kiss ZH J Psychiatry Neurosci. 2013;38(3):(120160)

Dr. Rajiv Mida *Non-viral engineering of skin precursor-derived Schwann cells for enhanced NT-3 production in adherent and microcarrier culture.* Shakhbazau A, Shcharbin D, Bryszewska M, Jumar R, Wobma WH, Kallos MS, Goncharova N, Seviaryn I, Kosmacheva S, Potapnev M, Midha R. Curr Med Chem. 2012;19(0):(5572-5579)

Dr. Rajiv Midha *Thoracic Nerve Root Hemangioblastoma-a Diagnostic Rarity.* Senjaya F, Midha R World Neurosurg. 2012;(0):()

Dr. Rajiv Midha *Advances in nerve repair.* Khuong HT, Midha R Curr Neurol Neurosci Rep. 2013;13(1):(322)

Dr. Rajiv Midha *Endoscopic Carpal Tunnel Release.* Senjaya F, Midha R World Neurosurg. 2012;(0):()

Dr. Rajiv Midha *Brief transvertebral electrical stimulation of the spinal cord improves the specificity of femoral nerve reinnervation.* Franz CK, Singh B, Martinez JA, Zochodne DW, Midha R Neurorehabil Neural Repair. 2013;27(3):(260-8)

Dr. Rajiv Midha *Nerve Transfer Strategies for Spinal Cord Injury.* Senjaya F, Midha R World Neurosurg. 2012;(0):()

Dr. Rajiv Midha *Evidence for a systemic regulation of neurotrophin synthesis in response to peripheral nerve injury.* Shakhbazau A, Martinez JA, Xu QG, Kawasoe J, van Minnen J, Midha R J Neurochem. 2012;122(3):(501-11)

Dr. Alim Mitha *Mechanical thrombectomy as first-line treatment for venous sinus thrombosis: technical considerations and preliminary results using the AngioJet device* Dashti SR, Hu YC, Yao T, Fiorella D, Mitha AP, Albuquerque FC, McDougall CG. Journal of Neurointerventional Surgery. 2013;5(1):(49-53)

Dr. Alim Mitha *A novel tissue engineering approach using an endothelial cell-seeded biopolymer to treat intracranial sacular aneurysms.* Mitha AP, Aronson JP, Hoh B, Auluck PK, Pomerantseva I, Vacanti JP, Ogilvy CS Journal of Neurosurgery. 2012;117(3):(546-554)

Dr. Alim Mitha *Clinical outcome after vertebral artery injury following blunt cervical spine trauma.* Mitha AP, Kalb S, Ribas-Nijkerk JC, Solano J, McDougall CG, Albuquerque FC, Spetzler RF, Theodore N. World Neurosurgery. 2012;(0):()

Dr. Alim Mitha *Endovascular recanalization of the chronically occluded brachiocephalic and subclavian arteries: Technical considerations and an argument for embolic protection.* Albuquerque FC, Ahmed A, Mitha AP, McDougall CG. World Neurosurgery. 2012;(0):()

Dr. Alim Mitha *Simulation and Augmented Reality in Endovascular Neurosurgery: Lessons from Aviation* Mitha AP, Almekhlafi MA, Janjua MJ, Albuquerque FC, McDougall CG Neurosurgery. 2013;72(1):(107-114)

Dr. Alim Mitha *Subdural Hematoma from a Cavernous Malformation* Schmitt AJ, Mitha AP, Germain R, Eschbacher J, Spetzler RF World Neurosurgery. 2013;(0):()



Neurosurgery - Faculty Member, Title, Authors, Citation

Dr. Yves Starreveld *Reduction of microglia activity in a model of multiple sclerosis by dipyridamole* Scott Sloka, Luanne Metz, Walter Hader, Yves Starreveld and V Wee Yong Neuroglia. 2013;(0):0

Dr. Garnette Sutherland *Advancing neurosurgery through translational research.* Lacey C, Sutherland G Neurosurgery. 2013;72 Suppl 1(0):(176-81)

Dr. Garnette Sutherland *Intraoperative magnetic resonance imaging and neuronavigation for transoral approaches to upper cervical pathology.* Dhaliwal PP, Hurlbert RJ, Sutherland GS World Neurosurg. 2012;78(1-2):(164-9)

Dr. Garnette Sutherland *Advanced cranial navigation.* Mert A, Gan LS, Knosp E, Sutherland GR, Wolfsberger S Neurosurgery. 2013;72 Suppl 1(0):(43-53)

Dr. Garnette Sutherland *The evolution of neuroArm.* Sutherland GR, Wolfsberger S, Lama S, Zarei-nia K Neurosurgery. 2013;72 Suppl 1(0):(27-32)

Dr. Garnette Sutherland *Controversy in the Management of Lenticulostriate Artery Dissecting Aneurysm: A Case Report and Review of the Literature.* Lama S, Dolati P, Sutherland GR World Neurosurg. 2012;(0):0

Dr. Garnette Sutherland *Merging machines with microsurgery: clinical experience with neuroArm.* Sutherland GR, Lama S, Gan LS, Wolfsberger S, Zareinia K J Neurosurg. 2013;118(3):(521-9)

Dr. Garnette Sutherland *Toward robot-assisted neurosurgical lasers.* Motkoski JW, Yang FW, Lwu SH, Sutherland GR EEE Trans Biomed Eng. 2013;60(4):(892-8)

Dr. Garnette Sutherland *Brain tumor surgery with 3-dimensional surface navigation.* Mert A, Buehler K, Sutherland GR, Tomanek B, Widhalm G, Kasprian G, Knosp E, Wolfsberger S Neurosurgery. 2012;71(2 Suppl Operative):(ons286-94; discussion ons294-5)

Dr. Garnette Sutherland *Treatment of Herniated Lumbar Disc by Sequestrectomy or Conventional Discectomy.* Shamji MF, Bains I, Yong E, Sutherland G, Hurlbert RJ World Neurosurg. 2013;(0):0

Dr. John Wong *Malignant emboli on Trans-cranial Title Doppler during Carotid Stenting predict post procedure DWI lesions.* Mohammed Almekhlafi, Andrew Demchuk, Sachin Mishra, Simerpeet Authors Bal, Bijoy Menon, Samuel Wiebe, Fiona M Clement, John Wong, Michael Hill, and Mayank Goya Stroke. 2013;(0):0

Dr. John Wong *Carotid Angioplasty and Stenting Is Safe in Women.* Shobha N, Almekhlafi MA, Pandya A, Couillard PL, Morrish WF, Wong JH, Hill MD Can Assoc Radiol J. 2012;(0):0

Dr. John Wong *The Albumin in Subarachnoid Hemorrhage (ALISAH) multicenter pilot clinical trial: safety and neurologic outcomes* Jose I. Suarez, MD; Renee H. Martin, PhD; Eusebia Calvillo, RN; Catherine Dillon; Eric M. Bershad,MD; R. Loch MacDonald, MD; John Wong, MD; Robert Harbaugh, MD for the ALISAH Investigators Stroke. 2012;43(3):(693-90)

Dr. John Wong *Pipeline embolization device in aneurysmal subarachnoid hemorrhage* Cruz JP, O'Kelly C, Kelly M, Wong JH, Alshaya W, Martin A, Spears J, Marotta TR. JNR Am J. Neuroradiol. 2013;34(2):(271-276)

Dr. John Wong *ENACT trial investigators. Safety and efficacy of NA-1 in patients with iatrogenic stroke after endovascular aneurysm repair (ENACT): a phase 2, randomised, doubleblind, placebo-controlled trial* Michael D Hill, Renee H Martin, David Mikulis, John H Wong, Frank L Silver, Karel G terBrugge, Genevieve Milot, Wayne M Clark, R Loch MacDonald, Michael E Kelly, Melford Boulton, Ian Fleetwood, Cameron McDougall, Thorsteinn Gunnarsson, Michael Chow, Cheemun Lum, Robert Dodd, Julien Poubanc, Timo Krings, Andrew M Demchuk, Mayank Goyal, Roberta Anderson, Julie Bishop, David Garman, and Michael Tymianski Lancet Neurology. 2012;(0):0

Dr. John Wong *Canadian experience with the pipeline embolization device for repair of unruptured intracranial aneurysms* O'Kelly CJ, Spears J, Chow M, Wong J, Boulton M, Weill A, Willinsky RA, Kelly M, Marotta TR. AJNR Am J Neuroradiology. 2013;(0):0

Physical Medicine and Rehabilitation - Faculty Member, Title, Authors, Citation

Dr. Pamela Barton *The Canadian STOP-PAIN Project. The Burden of Chronic Pain – Does Sex Really Matter?* Barton B Clinical J Pain, 2013

Dr. Brian Benson *Consensus statement on concussion in sport – the 4th international conference on concussion in sport held in Zurich, November 2012.* McCrory P, Meeuwisse W, Aubry M, Cantu B, Dvorak J, Echemendia R, Engebretsen L, Johnston K, Kutcher J, Raftery M, Sills A, Benson B, Davis G, Guskiewicz K, Herring SA, Iverson G, Jordan B, Kissick J, McCrea M, McIntosh A, Maddocks D, Makdissi M, Purcell L, Putukian M, Turner M, Schneider K, Tator C. BJSM 2013; 47: 250–258

Dr. Brian Benson *What are the most effective risk reduction strategies in sport concussion? From protective equipment to policy* McIntosh A, Maddocks D, Herring SA, Raftery M, Dvorak J. BJSM 2013; 47: 321–326.

Dr. Chantel Debert *Robotic Assessment of Sensorimotor Deficits After Traumatic Brain Injury.* J Neurol Phys Ther, Debert, C.T., Herter, T.M., Scott, S.H., Dukelow, S.P. J Neurol Phys Ther, 36(2):58-67, 2012

Dr. Sean Dukelow *The independence of deficits in position sense and visually guided reaching following stroke.* Dukelow SP, Herter TM, Bagg SD, Scott SH J Neuroeng Rehabil. 2012;9(0):(72)

Dr. Sean Dukelow *Fibrillation potential onset in peripheral nerve injury.* Willmott AD, White C, Dukelow SP Muscle Nerve. 2012;46(3):(332-40)

Dr. Denise Hill *Meta-analysis of botulinum toxin A Detrusor Injections in the Treatment of Neurogenic Detrusor Overactivity After Spinal Cord Injury.* Mehta S., Hill D., McIntyre A, Foley NI, Hsieh J., Ethans K., Teasell R., Loh E., Welk B., Wolfe D. Arch Phys Med Rehabil 2013 Apr 28. pii: S0003-9993(13)00317-1. doi: 10.1016/j.apmr.2013.04.011

Dr. Denise Hill *Best practices for the treatment and prevention of urinary tract infection in the spinal cord injured population: the Alberta Context.* Hill T., Baverstock R., Carlson K., Estey E., Gray G., Hill D., Ho C., McGinnis R, Moore K., Parmar R. Can Urol Assoc J 2013;7:122-130

Dr. Chester Ho *Pulsatile lavage for pressure ulcer management in spinal cord injury: a retrospective clinical safety review.* Bogie KM, Ho CH Ostomy Wound Manage. 2013;59(3):(35-8)

Dr. Chester Ho *Repeatability and clinical utility in stereophotogrammetric measurements of wounds* A.J. Davis, J. Nishimura, B.L. Goodman, C.H. Ho, K.M. Bogie Journal of Wound Care. 2013;22(2):(90-97)

Dr. Chester Ho *The Effect of Oxandrolone Treatment on the Healing of Chronic Pressure Ulcers in Persons with Spinal Cord Injury: A Randomized, Controlled Trial.* Bauman WA, Spungen AM, Collins JF, Raisch DW, Ho C., Deitrick GA, Nemchausky BA, Goetz LL, Park JS, Schwartz M, Merritt JL, Jayawardena V, Sanford P, Sabharwal S, Holmes SA, Nasar F, Sasaki R, Punj V, Zachow K, Chua WC, Thomas MD, Trinchler RC. Ann Intern Med. 2013;158(10):718-726. doi:10.7326/0003-4819-158-10-201305210-00006

Dr. Chester Ho *Cauda equina syndrome secondary to intravascular lymphoma.* Abuzinadah A, Almalik Y, Shabani-Rad M-T, Ho CH, George D, Alant J, Zochodne D. Neurol Clin Pract June 2012 vol. 2 no. 2 158-161

Dr. Chester Ho *Best practices for the treatment and prevention of urinary tract infection in the spinal cord injured population: the Alberta Context.* Hill T., Baverstock R., Carlson K., Estey E., Gray G., Hill D., Ho C., McGinnis R, Moore K., Parmar R. Can Urol Assoc J 2013;7:122-130

Dr. John Latter *The effect of surface and season on playground injury rates.* LJ Branson, J Latter, GR Currie, A Nettel-Aguirre, T Embree, BE Hagel. Paediatric Child Health. 2012;Vol 17, No 9(0):(485-489)

Dr. Rodney Li Pi Shan *Neuromusculoskeletal Ultrasound Courses: How Effective Are They in the Long Term?* Rajasekaran S, Shan R J Ultrasound Med. 2013;32(suppl):S22

Dr. Dan McGowan *Results of a phase II placebo-controlled randomized trial of minocycline in acute spinal cord injury.* Casha S, Zygun D, McGowan MD, Bains I, Yong VW, Hurlbert RJ. Brain 2012; 135;1224–1236 | 1224



Neurology



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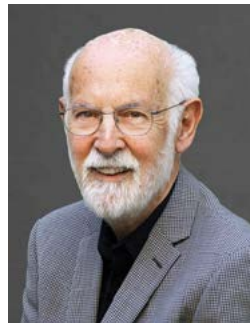
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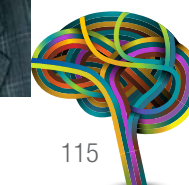
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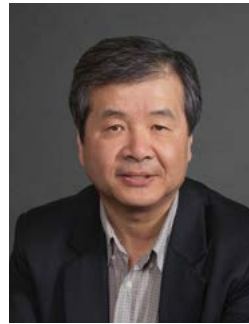


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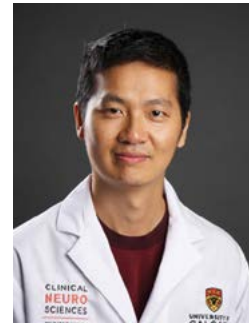
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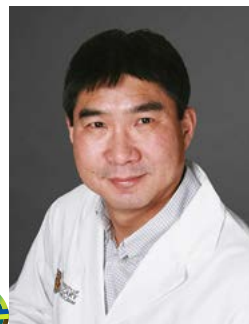
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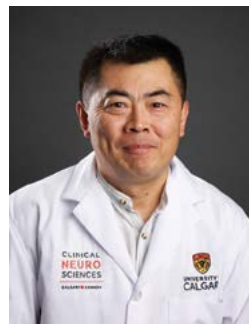
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