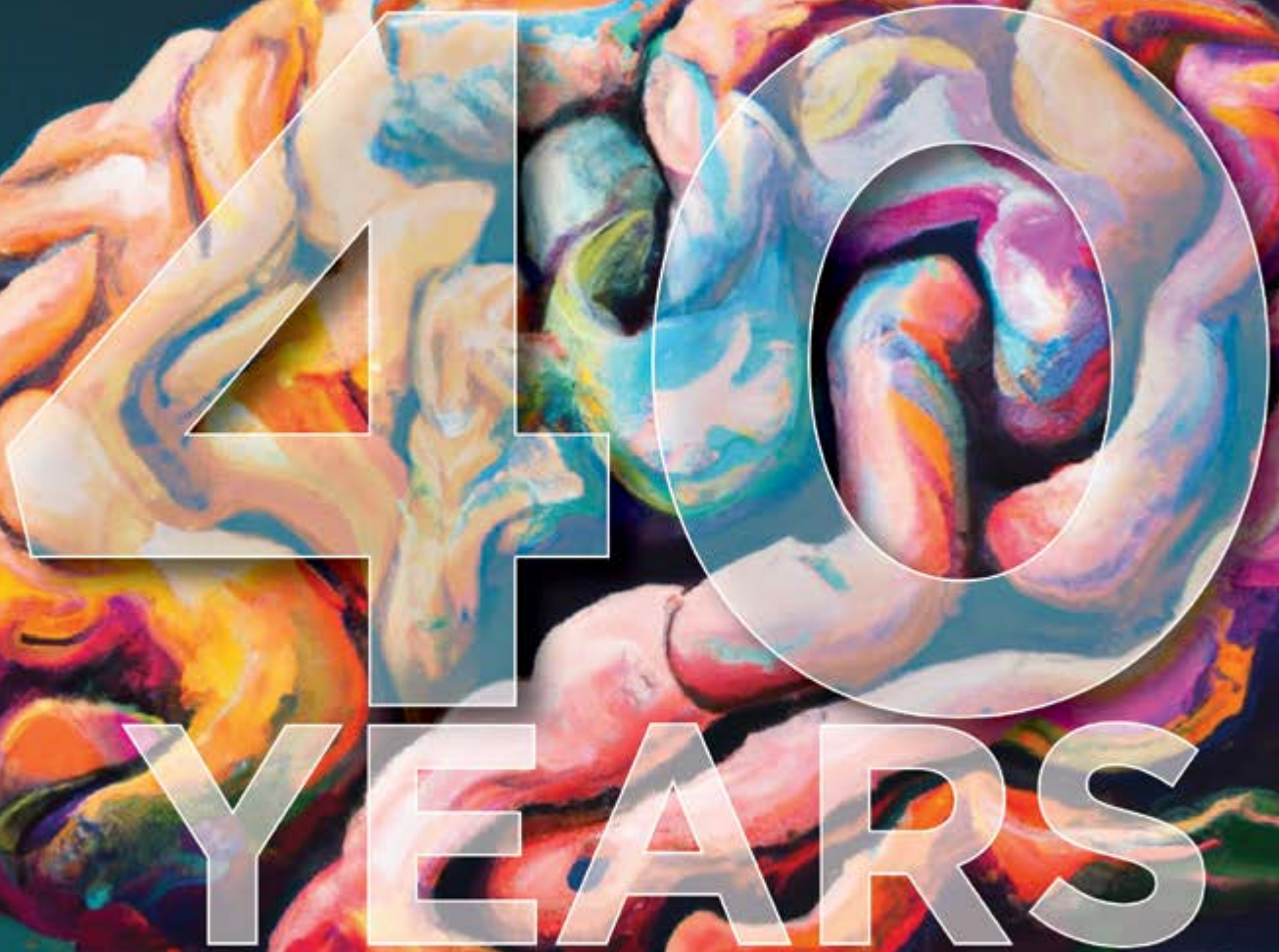


NEURO

ANNUAL REPORT
2021-2022



40
YEARS

CLINICAL
NEURO
SCIENCES
CALGARY ♦ CANADA

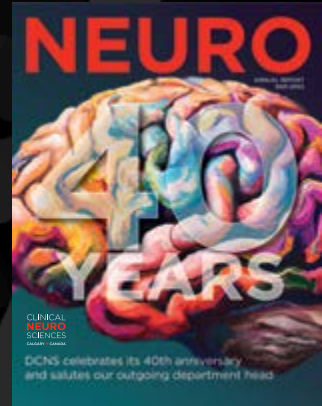
DCNS celebrates its 40th anniversary
and salutes our outgoing department head

Department Vision

Caring, Educating, Innovating. Together.

Department Mission

By building healthy teams, collaborating with patients, outstanding care providers, researchers, educators and health care administrators, the Department of Clinical Neurosciences will provide compassionate, equitable, and high-quality care to people dealing with neurological problems. While doing this, we will constantly strive to learn and to improve.



Cover photo

Artwork for our 40th anniversary cover was “painted” by an AI machine called DALL-E.

Department Goals

- Provide compassionate, timely and high quality care to patients and their families.
- Lead in neuroscience research.
- Build innovations in care delivery.
- Train the specialists and leaders of tomorrow.
- Flourish in a fulfilling collaborative work environment.
- Communicate transparently within and outside our organization.
- Measure and optimize patient outcomes.

Department of Clinical Neurosciences

Room 1195 – Foothills Medical Centre
1403 29th Street N.W.
Calgary, Alberta
T2N 2T9
403-944-1260

CLINICAL
NEURO
SCIENCES
CALGARY ♦ CANADA



Alberta Health
Services



UNIVERSITY OF
CALGARY

Table of Contents

Message from the Department Head of Clinical Neurosciences	2
Recruitment at DCNS.	3
Membership	4
Accomplishments	5
Organizational Success + Challenges.	6
Equity, Inclusion and Diversity	7
Clinical Metrics.	8
The Section of Neurology	
Neurology Overview — Dr. Lara Cooke	10
The Section of Neurosurgery	
Neurosurgery Overview — Dr. Steve Casha	14
The Section of Physical Medicine and Rehabilitation	
Physical Medicine and Rehabilitation Overview — Dr. Sean Dukelow.	16
The Section of Translational Neuroscience	
Translational Neuroscience Overview — Dr. V. Wee Yong	18
Residency Programs	
Resident Research Day	20
Neurology Residency Update — Dr. Vikram Karnik.	21
Physical Medicine and Rehabilitation Residency Update — Dr. George Francis	22
Neurosurgery Residency Update — Dr. Jay Riva-Cambrin	23
Fellowships and Research	24
Faculty Members	25-31

Message from the Department Head

Dr. Rajiv Midha

Despite the challenges that COVID-19 continues to burden our members with, including significant impact on health and wellness, it's important that we celebrate our successes and achievements.

Our department's clinicians use their extraordinary skills to care for patients with life-changing diagnoses. They do this with the utmost empathy, patience and respect.

Our researchers, both in the lab and at the bedside, seek solutions to problems that are stubbornly difficult. We continue to add major discoveries and publish our work with amazing productivity, reflected in annual and comparative bibliometric data. (Though it falls after this report's time period, **Dr. Peter Stys** recently won the inaugural \$1M Hopewell M.I.N.D. Prize—generously funded by Mr. Sanders Lee. This is a major accomplishment. Congratulations, Peter!)

Equally important, our members are educating the next generation of outstanding clinicians and clinician-scientists. In fact, two of our recent recruits are former residents (**Dr. Nancy Scholz** and **Dr. Michael Yang**), and another former resident, **Dr. Vikram Karnik**, has taken on the leadership of the neurology residency program.

Successes like these have been occurring in our department for over 40 years and we took the time to formally celebrate this milestone in October. We reconnected with former colleagues, we recognized those who led the department in its early years (including **Dr. Frank Leblanc** at right), and we reminisced on the years that pass by all too quickly.

It was also an opportunity for me to reflect on my 10 years as department head. I have been proud to lead the department during a period of exceptional growth and will leave the position confident that it is positioned well for decades of continued growth.

I have no doubt that the successes will continue under its newly appointed leader, **Dr. Nathalie Jetté**.



▲ Celebrating our 40th anniversary with **Dr. Frank LeBlanc**.

Dr. Jetté, a neurologist, is well known to many in our department. She moved to New York five years ago to join the Icahn School of Medicine at Mount Sinai and we are fortunate to have been able to draw her back to Calgary.

I know Dr. Jetté has a vision for the Department of Clinical Neurosciences that will see it thrive in the next decade and I'm confident she'll enjoy the success I have had.

Please enjoy our annual review—including accomplishments from the year, challenges we've faced, and some clinical metrics from our department.

Rajiv Midha

Dr. Rajiv Midha
Professor and Head
Department of Clinical Neurosciences

RECRUITMENT AT DCNS

The Department of Clinical Neurosciences has been very fortunate to recruit a number of talented physicians in 2021-2022.

Representing all three of our clinical sections, we recruited a psychiatrist, neurosurgeon and neurologist in the past year: Dr. Nancy Scholz, Dr. Michael Yang and Dr. Jonathan Yeung Laiwah.

As in previous years, our residency programs have played an outsize role in our recruitment. Two of the three additions this year (Dr. Scholz and Dr. Yang) were recent graduates of our residency programs.

They have already become tremendous assets to our department.



Dr. Nancy Scholz
Psychiatrist



Dr. Michael Yang
Neurosurgeon



**Dr. Jonathan
Yeung Laiwah**
Neurologist

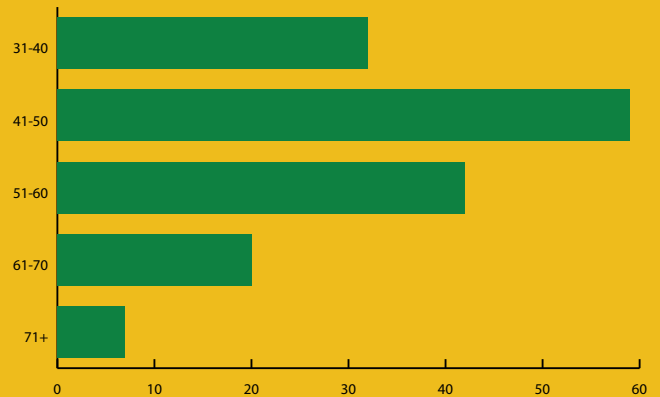
MEMBERSHIP

Our department continues to grow in its three clinical areas: Neurology, Neurosurgery and Physiatry.

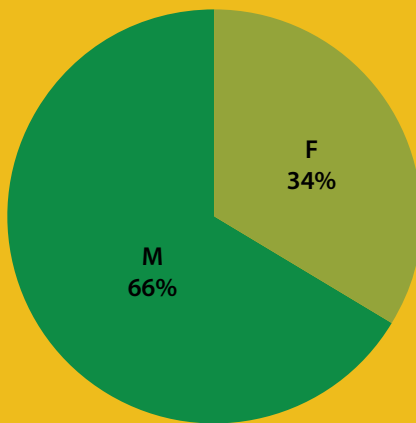
We have 160 members in our department and their roles are roughly split between Clinical/Adjunct, Major Clinical and GFT.

We celebrate equity, inclusion and diversity in our ranks and strive to improve our hiring, promotion and leadership processes across the department.

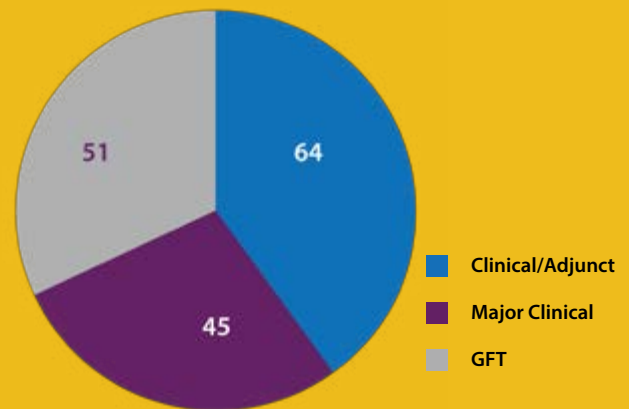
Age Distribution



Gender 160 Faculty Members

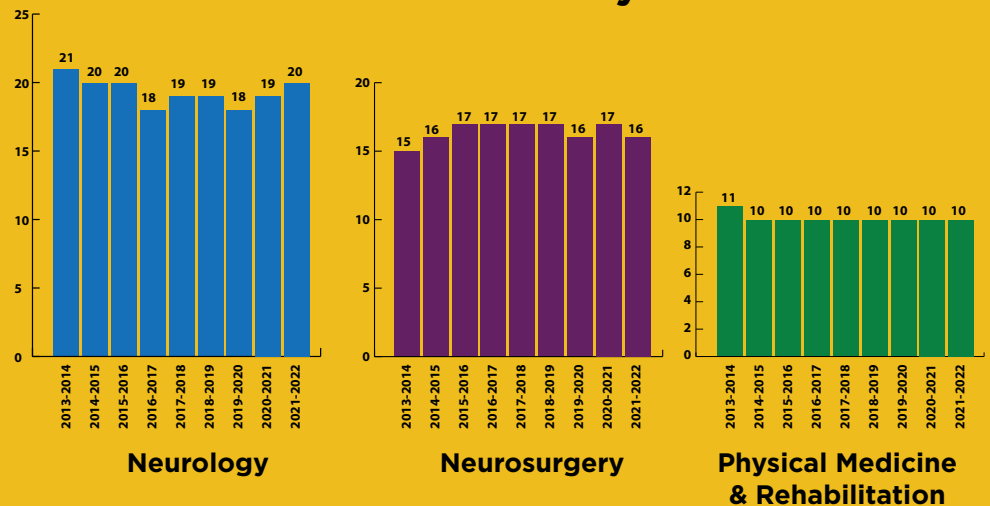


Appointments to Faculty in DCNS



Resident Education by Section

The Department of Clinical Neurosciences is exceptionally proud of our three residency programs that are home to 46 talented residents doctors.



ACCOMPLISHMENTS

There were numerous highlights in the past year—awards received by individual members and entire teams—as well as publication successes.

Dr. Sam Wiebe was selected as the winner of the Canadian League Against Epilepsy Wilder Penfield award – which honours CLAE members with outstanding lifetime clinical and research contributions in epilepsy.

Dr. Wee Yong was awarded the Inaugural Cumming Scholar Award, 2022-2027.

Dr. Aravind Ganesh was granted a 2022 International Scholarship by the American Academy of Neurology. Dr. Ganesh was also awarded a preclerkship teaching award by the UofC Medicine Class of 2024.

Dr. Aaron Phillips was selected for the Turnbull-Tator Award by Brain Canada.

The Calgary Movement Disorders Team was recognized by The Michael J. Fox Foundation for Parkinson's Research as one of eight international academic centers to train a new movement disorder clinician-researcher.

Stoke Fellow **Dr. Nishita Singh** was named Fellow of the Year by the Foothills Medical Centre Staff Association.

Dr. Sean Dukelow and **Dr. Andrew Demchuk** (Co PIs) received a \$3.5M Brain Canada Grant to launch the CanStroke Recovery Clinical Trials platform.

Dr. Tamara Pringsheim was recognized as one of Clarivate's Highly Cited Researchers – recognizing researchers with multiple papers ranking in the top 1% by citations

Our members collaborated and published significant research in the past year. A study led by neurologist **Dr. Bijoy Menon**, the AcT Trail, was covered by media across country. The largest stroke clinical trial in Canadian history demonstrated the efficacy of Tenecteplase over Alteplase in treating ischemic stroke. The trial enrolled 1,600 patients across Canada and the results were published in The Lancet in June 2022. Stroke treatment around the world will change as a result of this work. (See story on Page 9.)



▲ **Dr. Bijoy Menon.**

ORGANIZATIONAL SUCCESS



Dr. Lara Cooke
Neurology



Dr. Steve Casha
Neurosurgery



Dr. Sean Dukelow
Physical Medicine &
Rehabilitation



Dr. Wee Yong
Translational
Neurosciences

The challenges we have faced over the past year would not have been manageable without tremendous leadership from our section chiefs.

Our department is indebted to **Dr. Lara Cooke, Dr. Steve Casha, Dr. Sean Dukelow** and **Dr. Wee Yong** for their heroic work to safeguard our patients, our research and our members.

Another success in our department is the Quality Improvement work overseen by **Erin Barrett**, our QI Lead. In addition Erin's invaluable contributions, we have also recently hired a data analyst and coordinator. This new role will be responsible for analytics for QI projects.

Dr. Aravind Ganesh continues to lead Equity, Diversity and Inclusion initiatives for our

CHALLENGES

As with other departments, the COVID-19 pandemic continues to impact clinics, in-patient and out-patient activity within DCNS.

Health, wellness and burn-out concerns amongst our faculty and staff are persisting.

Surgery cancellations continued in 2021-22, resulting in countless rescheduled and catch-up surgeries. OR cases at Foothills Medical Centre have stabilized below pre-pandemic levels and elective cases are starting to increase with the Alberta Surgery Initiative recovery targets.

Outpatient access issues have been partially mitigated with virtual care, but many of our patients must be examined in person.

department, including quarterly Health Equity Rounds. We are grateful for his continued leadership.

The Connect Care launch at Foothills Medical Centre this year would not have been a success without the leadership of **Dr. Chris Hahn, Dr. Chris Grant** and **Dr. Chris White**. Their stewardship of Connect Care within DCNS ensured our members were well prepared for Launch Day. Additional thanks go to our residents for leading the cutover at FMC.



The closure of the Seizure Monitoring Unit at South Health Campus has resulted in decreased capacity and long wait-times for epilepsy surgery patients.

Clinical research has been severely impacted by pandemic-related site restrictions at FMC. In some cases, funding has been withdrawn because trials could not start on time.

Though it was successfully launched at FMC this year, Connect Care was a major source of stress for members.

The current fiscal and political environment in Alberta has made it challenging to recruit physicians from outside the province.

EQUITY, INCLUSION & DIVERSITY

Through our actions, policies and recruitments, we define ourselves and our commitment to equity, inclusion and diversity.

One of our recent commitments is Health Equity Rounds, held in place of our departmental Grand Rounds, and which are well attended by our members.


We hold Health Equity Rounds on a quarterly basis to engage department members on a range of topics.


This year, subjects included "Religion and Healthcare"; and "Patients Experiencing Homelessness."

CLINICAL NEURO SCIENCES
GRAND ROUNDS
Neurology, Neurosurgery, Physical Medicine and Rehabilitation, Translational Neuroscience
ZOOM ONLY 08:00-09:00 Case Presentations 09:00-10:00 Guest Speaker

Friday, November 5th, 2021

Health Equity Rounds:
"Intersectionality of religion and health care"


Shyane Wieggers MD
PGY2, Physical Medicine and Rehabilitation
Department of Clinical Neurosciences


Gerald Pfeffer
PhD, MD, CM, FRCPC
Assistant Professor of Neurology
Department of Clinical Neurosciences

For physicians recording their hours, visit: cumming.ucalgary.ca/departments/dcns/attendance

Click to join DCNS Grand Rounds on Zoom
<https://albertahealthservices.zoom.us/j/99354717491?pwd=Nk1GS3Fob1ZuK1JlRmJxelh5eTFyQT09>
Meeting ID: 993 5471 7491 Passcode: 127805
Audio-only phone line: +1 587 328 1099

CLINICAL NEURO SCIENCES
GRAND ROUNDS
Neurology, Neurosurgery, Physical Medicine and Rehabilitation, Translational Neuroscience
ZOOM ONLY 08:00-09:00 Case Presentations 09:00-10:00 Guest Speaker

Friday, March 18th, 2022

Health Equity Rounds:
"Caring for Patients Experiencing Homelessness"

Van Nguyen MD
CUPS Medical Director

Benjamin Beland MD
PGY-3
Section of Neurology
Department of Clinical Neurosciences

Kerri Martin
CUPS Connect 2 Care
Health Navigator

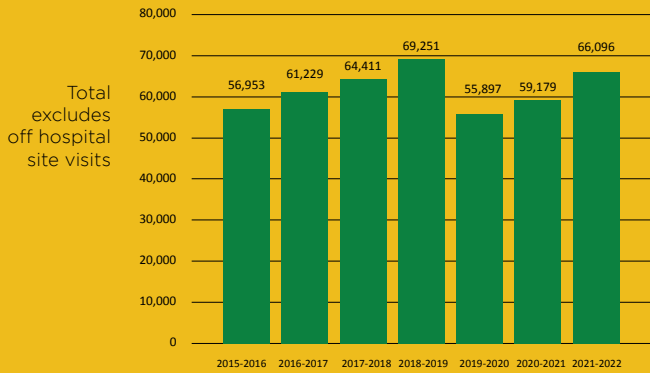
Vikram Karnik MD
Neurologist
Clinical Assistant Professor
Department of Clinical Neurosciences

For physicians recording their hours, visit: cumming.ucalgary.ca/departments/dcns/attendance

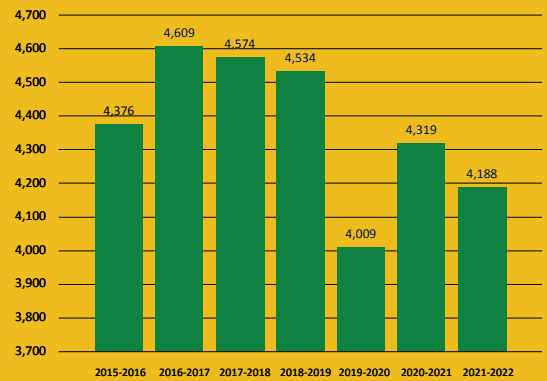
Click to join DCNS Grand Rounds on Zoom
<https://albertahealthservices.zoom.us/j/99354717491?pwd=Nk1GS3Fob1ZuK1JlRmJxelh5eTFyQT09>
Meeting ID: 993 5471 7491 Passcode: 127805
Audio-only phone line: +1 587 328 1099

CLINICAL METRICS

Total Outpatient Visits

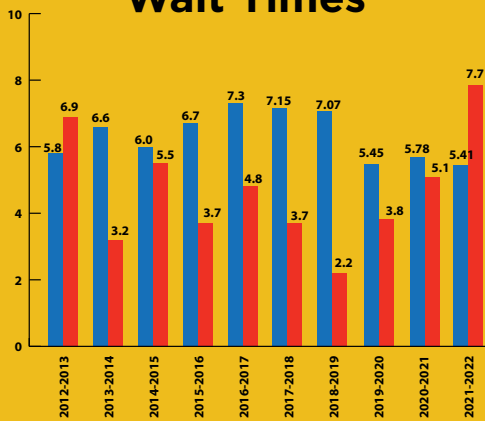


Total Discharges

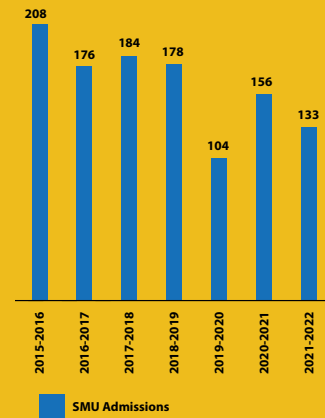


Neuroscience discharges from ACH, FMC, SHC

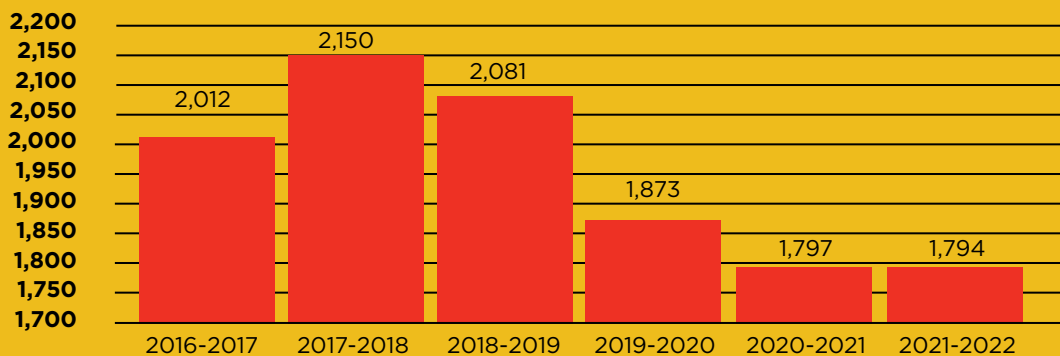
EMG Outpatient Volumes/ Wait Times



SMU Admissions



Surgical OR Cases -Neurosurgery FMC



*Does not include endovascular procedures (~300/yr)

Heart attack drug now standard treatment for acute ischemic stroke

In the largest stroke clinical trial ever run in Canada, researchers have shown Tenecteplase (TNK), a safe, well tolerated drug, commonly used as a clot buster for heart attacks, is an effective treatment for acute ischemic stroke. Led by researchers with the University of Calgary at the Foothills Medical Centre and Sunnybrook Health Sciences Centre, fully affiliated with the University of Toronto, the study included 1,600 patients at hospitals throughout Canada.

“It is truly an important finding that I share with my colleagues from coast to coast,” says Dr. Bijoy Menon, MD, professor at the University of Calgary, neurologist at the Foothills Medical Centre and co-principal investigator on the study.

“Through this collaboration these findings could revolutionize stroke treatment throughout the world.

Tenecteplase is known to be an effective clot dissolving drug. It is very easy to administer which makes it a game changer when seconds count to save brain cells.”

Based on current guidelines, Alteplase (tPA) is the recommended drug for acute ischemic stroke patients. The challenge is that the drug is more complex to administer. It takes up to an hour and requires an infusion pump that needs to be monitored. The pump can be cumbersome when transporting a patient within a hospital, or to a major stroke center for treatment.

“One of the reasons Tenecteplase is so effective is that it can be administered as a single immediate dose. That’s a big advantage, saving critical time and complication. TNK could potentially be administered wherever the patient is seen first, at a medical centre or small hospital.”

▼ AcT Trial collaborators celebrate with Dr. Bijoy Menon.



The AcT Trial compared TNK to tPA in a randomized trial. The results published in The Lancet show that TNK worked as well as, if not better than, the current recommended drug, tPA. TNK attaches itself to the clot for a longer period of time than tPA, which means that blood flow is restored faster and for a longer period of time. Along with discovering a better way to treat acute ischemic stroke, the team also established a more cost effective, and efficient way to conduct clinical trials.

The trial engaged patients and their families in study design and completed all enrolments during the pandemic when health systems were under significant stress. The study involved 22 primary and comprehensive stroke centers across Canada and was supported by the Canadian Institutes of Health Research (CIHR), Alberta SPOR Support Unit - Strategy for Patient-Oriented Research (SPOR), Quality Improvement & Clinical Research Alberta Stroke Program (QulCR).

The Section of Neurology

Section Head: Dr. Lara Cooke

ENTERING INTO THE second year of the pandemic, the Section of Neurology began to return to a new 'normal': We welcomed patients back into our clinics in person, and began the return to research and teaching activities in the usual manner. We continued with our successful recruitment — and a number of our recent faculty are already making their mark.

Dr. Vikram Karnik, who joined us last year, started a Movement Disorders Clinic at South Health Campus. While growing the program there, he also took on the role of site lead at South Health Campus.

Another recent recruit, Dr. Aravind Ganesh, has been an outstanding addition, receiving innumerable honours and peer reviewed grants since joining the group.

Dr. Prin Chitsantikul, who joined us last year after completing residency training in Calgary, is poised to take over leadership of the CHAMP program in the coming year.

New this year is Dr. Jonathan Yeung Laiwah, who joins us following neurology residency training at Western University, and a fellowship in sleep medicine at Harvard University. He is primarily based at Rockyview Hospital and in the Sleep Clinic at Foothills Medical Centre. He has already had multiple invites to present in his area of subspecialty expertise and is proving to be an outstanding teacher as well as clinician.

Members of the section have been tremendously successful in all aspects of their work during the 2021-2022.

Selected Awards and Honours

- Dr. Sam Wiebe: Canadian League Against Epilepsy (CLAE) Wilder Penfield Award for Lifetime Achievement in Clinical and Research Work in Epilepsy
- Dr. Aravind Ganesh: Outstanding Reviewer Award – Stroke; Heart & Stroke Foundation of Canada New Investigator Award; Heart & Stroke Foundation of Canada Henry Barnett Scholarship



- Dr. Scott Kraft: 2 grants to support SPARK Calgary: Alberta Innovates, Calgary Innovation Coalition
- Dr. Michael Hill: Canadian Society for Clinical Investigation Distinguished Scientist Award
- Dr. Bijoy Menon: Royal Society of Canada College of New Scholars
- Dr. Veronica Bruno: Received a \$500K grant for two years to pilot a palliative care clinic for the care of patients with advanced movement disorders
- Dr. Carlos Camara-Lemarrroy: MS Society of Canada Catalyst Research Grant
- Dr. Peter Stys: MS Society of Canada – Discovery Research Grant
- Dr. Eric Smith – CIHR Health Research Training Platform Pilot Grant

- Dr. Lara Cooke & Kelly Burak – Medical Council of Canada Outstanding Achievement Award in the Evaluation of Clinical Competence
- Dr. Jodie Roberts – Awarded a Helios Grant for an MS & Neuroimmunology Fellowship in Calgary and Melbourne
- Dr. Chris Hahn, CJNS Reviewer of the Year
- Dr. Nishita Singh – Physician of the Year, Fellow Category, CAMSS

Research Productivity

Academic output from the section remains extremely high across all programs. In addition to many successful grants, our members published over 419 papers in their respective fields over this reporting period, many of which have been practice-changing. Just two such high-profile examples are the reporting of the emergence

of a high incidence of functional tic disorders in adolescents during the pandemic and proof of non-inferiority of tenecteplase in the treatment of acute stroke; it will now replace alteplase in our hospitals.

Clinical Care & Innovation

Quality improvement remains a priority in the Section of Neurology with dedicated expertise from the Departmental Quality lead, Erin Barrett and a sectional leader, Dr. Megan Yaraskavitch. In this reporting year, both have made major contributions to a national initiative, led by Calgary neurologists, to develop a set of made-in-Canada quality indicators for the care of people admitted to hospital for treatment of their neurological problems.

CONTINUED ON PAGE 12



Post doctoral fellow Dr. Jessalyn Holodinsky and stroke neurologist Dr. Michael Hill are interviewed by media after publishing research showing annual flu shots can greatly reduced risk of stroke in adults.



◀
**QI leaders
Erin Barrett
(left) and
Dr. Megan
Yaraskavitch.**

We eagerly anticipate the launch of two new clinical programs in the 2022-2023 reporting year: The Advanced Care Team for Parkinson's (ACT) program, a program with a palliative focus of care for people with advanced Parkinson's Disease. In addition, Dr. Gabriela Gilmour will be joining us to build a program focused on Functional Neurological Disorders at South Health Campus in 2023.

Finally, we anticipate that we will build our person-centred care activity through the initiation of a patient-reported feedback strategy specific to neurology.

The aspirational goal is that ultimately, every person who interacts with our neurology group will have the opportunity to provide immediate feedback, and that feedback will be used to drive improvements in person-centred care in neurology.

CONTINUED FROM PAGE 11

We anticipate that in the coming year, we will begin to use these to guide further improvement initiatives for our inpatient services, which remain very busy across all hospital sites. This work will allow application of health systems data, presented in clinical dashboards, to be used to drive quality initiatives across the Calgary zone for inpatient neurology care.

Goals for the Coming Year:

2022-2023 is going to be the year of recruitment in the section. We anticipate that we will see eight new members join our group in the Multiple Sclerosis, General Neurology, Functional Neurological Disorders, Cognitive, Neuromuscular and Epilepsy programs. We look forward to being able to welcome them to a flourishing clinical and academic environment and to our trainees being able to learn from them in the years to come. We anticipate that this will lead to increased clinical throughput and academic discovery in the neurosciences, with abundant opportunity for collaboration with our colleagues across the other three sections of the Department of Clinical Neurosciences as well as beyond the Department into the Institutes and across the faculty.

In Memoriam

Dr. David Gaétan Patry
1945 - 2022

Dr. David Patry passed away on April 15th, 2022, at home with his family at his side. Dr. Patry was a beloved member of the Section of Neurology, who mentored generations of students, residents, fellows, and faculty over his nearly 40-year career in Calgary. He was a brilliant clinician, educator, and clinical researcher, who participated in or led more than 90 clinical research trials over the course of his career. He was a widely recognized and respected leader in the fields of Multiple Sclerosis and Cognitive and Behavioural Neurology in Canada and internationally. An avid cyclist, he raised thousands of dollars and cycled over 3,000 km in support of Canadians living with Multiple Sclerosis.

Beyond being deeply knowledgeable about the science and clinical nuances in his field, Dr. Patry will be remembered as a leader, a mentor, teacher, and friend who brought laughter, empathy, and a deep curiosity about the human condition to every encounter with patients, staff, colleagues, and learners. He is deeply missed by all of us in the section.

We are grateful to his large, and loving family, who shared him with us for all these years.

He will be deeply missed, cherished, and celebrated by his wife Beverly; his children, Michelle, Allan, Jonathon, Andrea, Emily, and Joel, and their spouses and partners; his seven grandchildren, Jessica, Daniel, Shyloh, Matthew, Ella, Lila, and Linden; his siblings, Patrick, Gaetanne, and Gloria, and their spouses; as well as extended family of in-laws, nieces, nephews, cousins, and friends.



▲ Dr. David Patry.

A beautiful painting created by his son, artist Joel Patry, has been hung at South Health Campus in Dr. Patry's honour. In June of 2023, a team of neurology residents, staff, friends, and family will ride in his honour in MS Bike on a team called "Miles for Myelin".

The Section of Neurosurgery

Section Head: Dr. Steve Casha

THE SECTION 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 Translational Neurosciences within the Department of Clinical Neurosciences.

With its highly integrated and collaborative programmatic approach, the section provides sub-specialized care to the patient population. That population includes the geographic region of Southern Alberta as well as Eastern British Columbia in the Kootenay Region and Western Saskatchewan, encompassing an approximate catchment population of 2.5 million. Care is provided by 16 sub-specialist academic neurosurgeons, all of whom also provide general and emergency neurosurgical services.

Specialized programs include cerebrovascular and endovascular neurosurgery, epilepsy neurosurgery, adult hydrocephalus surgery, neuro-oncology, skull base surgery, pediatric neurosurgery, peripheral nerve surgery, functional neurosurgery, stereotactic radiosurgery and spine surgery.

In partnership with neurology, rehabilitation medicine, orthopedic surgery, neuroradiology, and radiation oncology, our members provide the highest quality of sub-specialized care for this patient population.

The total operative volume delivered by neurosurgeons was 1,846 cases in 2021-22. There were approximately 100 cases of bedside and Intensive Care Unit procedures, about 300 cases of endovascular procedures in the neuro-interventional suite, and about 100 radiosurgery cases. In addition, the section saw over 8,500 out-patient visits in 2021-22.

Highlights

- We remain very proud that the Charles Taylor Memorial Lectureship pays homage to Calgary's first neurosurgeon. In 2022, Dr.



David Limbrick (the T.S. Park Chair and Chief of Pediatric Neurosurgery, Executive Vice Chair of Neurological Surgery at Washington University and Neurosurgeon-in-Chief at St. Louis Children's Hospital) was the 17th annual Charles Taylor lecturer.

- Other respected professors and neurosurgeons that joined us this past academic year include Dr. Mats Tullberg (University of Gothenburg, Sweden) and Dr. Galareh Zadeh (University of Toronto)
- For the 14th year running, the highly regarded Spine and Peripheral Nerve Anatomy and Surgery Course exposed neurosurgery and orthopedic residents from across the country to the nuances of spine and peripheral nerve surgery in a hands-on, supportive environment using didactic and cadaveric methods.

Education

The neurosurgery residency training program continues to be the pride of the section. Two new residents are accepted each year, within a current allotment of 17 trainees. The program is known for 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.

Numerous fellows joined our section in various sub-specialties, which is another positive indicator of Calgary's strong reputation for excellent training and care.

Research

Members continue to be involved in intensive research, with several of them conducting peer-reviewed and funded basic science and/or clinical research programs.

Many of these members partner with the Hotchkiss Brain Institute and the Alberta Children's Hospital Research 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, basic bench research in nerve regeneration, functional neurosurgery and deep brain stimulation, traumatic brain injury, laboratory work using brain tumour-initiating stem cells, intravascular stent development, pain management and hydrocephalus. We also proudly house one of the world's foremost laboratories in surgical robotics.

Notable recognition in 2021-22:

Dr. Mark Hamilton:

1) PRIHS 6 Grant Project Title: Reducing Ventricular/Lumbar Drain and Ventricular Shunt Insertion Infections in the Neurosurgery, Trauma, and ICU Patient Population in Alberta (\$942,262).

2) The Adult Hydrocephalus Clinical Research Network (AHCNRN), which I chair, was successful with our NIH U01 Grant submission funding a randomized placebo-controlled trial of shunting in iNPH with the additional assessment of imaging, neuropsychology, and CSF biomarkers. Our application was approved on the first submission with a requested budget of approximately \$14.3 million USD. The study will be run through John Hopkins University, Baltimore; it includes all 8 AHCNRN centers and 12 additional preselected sites spanning four countries in North America and Europe.



◀ **Neurosurgery residents attend an extracranial-intracranial bypass course in 2022.**

The Section of Physical Medicine & Rehabilitation

Section Head: Dr. Sean Dukelow

PHYSICAL MEDICINE AND REHABILITATION is a branch of medicine that is focused on improving quality of life and maximizing independence in activities of daily living. A physician with specialty training in Physical Medicine and Rehabilitation is called a physiatrist.

We have 43 members of our section. We have many different programs within our section that focus on individuals with neurologic conditions such as stroke, spinal cord injury, acquired brain injury, neuromuscular disorders, cerebral palsy, and musculoskeletal conditions such as neck and back pain, individuals with amputations and individuals with burns. Physiatrists tend to work within interdisciplinary care settings and often work in teams including social workers, psychologists, physical therapists, occupational therapists, speech therapists, and others.

COVID 19 caused a significant disruption our programs with vast implications to both clinical care and the academic mission of the section. Over the course of 2021-2022, things returned to a “new normal”.



Clinical care continued with heightened awareness and surveillance for infectious processes. Clinical trials and research that had been stopped as a result of the pandemic were allowed to resume and new multi-centred trials led out of Calgary launched. Quality Improvement initiatives began again.

Music therapy programs continued to progress in their maturity. In-person meetings, including team rounds, were once again allowed to occur. The pandemic created a difficult time for all, but the slow return of the “new normal” has allowed the section to get back on track.



▲ Volunteer Rishma Kassam works out with Physical Medicine and Rehabilitation researchers who are studying the role of aerobic exercise for the treatment of persistent post-concussion symptoms.

We continue to be very proud of our residency program. Our graduating residents were successful in completing their Royal College examinations. We have an excellent set of residents who have stepped up over the course of the pandemic.

Quality care to individuals that require it remains our top priority. While how we deliver care may have changed as a result of the pandemic, we remain committed to providing the best care possible for our patients.

►
The music therapy program has expanded from Foothill Medical Centre to other Calgary hospitals.



The Section of Translational Neuroscience

Section Head: Dr. V. Wee Yong

THE SECTION OF TRANSLATIONAL NEUROSCIENCE

in the Department of Clinical Neurosciences consists of six primary members distinguished by their PhD background. Research areas for members include neurodegenerative diseases, movement disorders and multiple sclerosis (MS), with a focus on understanding the pathogenesis of these disorders and the discovery and translation of new therapies into the clinic. These therapies include those that may reduce injury to the compromised nervous system and those to promote brain repair. In 2022, ongoing clinical trials that are initiated by results from members' laboratory include hydroxychloroquine in primary progressive MS, hydroxychloroquine plus indapamide in non-relapsing secondary progressive MS, and niacin in glioblastoma.

Translational Neuroscience members have benefited from close collaboration with clinical colleagues, and the access to clinical specimens from people living with various neurological disorders. In turn, members from other sections of the Department have benefited from the enhancement of translational and precision medicine. In 2022, we saw the departure of Dr. Oury Monchi to a higher position at McGill University, and we welcome Associate Dean (Research) Dr. Gerald Zamponi into our section as a primary member in order to facilitate his translational medicine activities in the area of pain treatment.

Dr. Shalina Ousman is an Associate Professor and a member of the Multiple Sclerosis (MS) and Spinal Cord/Nerve Injury and Pain Brain and Mental Health Teams at the Hotchkiss Brain Institute. Her research is focused on investigating endogenous protective mechanisms in MS and peripheral nerve regeneration. For her MS work, Dr. Ousman is investigating the processes that contribute to progression of the disease while her peripheral nerve injury studies are focused on understanding why Schwann cells become dysfunctional in the injured aging peripheral nervous system. Her research is currently funded by CIHR.



Dr. Hedwich Kuipers is an Assistant Professor and has been a member of the Hotchkiss Brain Institute (HBI) MS Brain and Mental Health Team since April 2018. She holds a membership at the Snyder Institute for Chronic Diseases as well. She currently is the chair of the HBI's Equity, Diversity and Inclusion Committee. Dr. Kuipers's research is aimed at understanding the interaction between immune cells entering the CNS and its resident cells. Her main focus is on astrocytes, whose role in neuroinflammation is often overlooked. She has shown before that these cells, which are highly abundant in the brain, can release factors that help T lymphocytes infiltrate into CNS tissue. She investigates how astrocyte functions change over the course of (experimental) MS pathogenesis, and how these changes affect their interaction with T cells, using molecular and cell biology approaches, as well as animal models. In addition, she studies how astrocytes are affected by the oxygen levels

they encounter, which can vary in different disease states. Dr. Kuipers's research is supported by the Natural Sciences and Engineering Research Council of Canada, the MS Society of Canada, the Canadian Foundation for Innovation and the HBI.

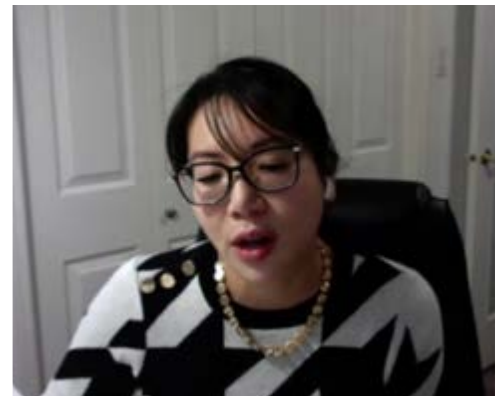
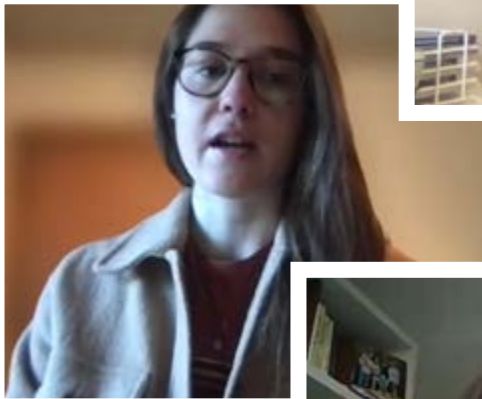
Dr. Minh Dang Nguyen, Associate Professor, has established numerous collaborations aiming to understand the molecular and cellular mechanisms underlying neurodegenerative disorders. He is a co-recipient with Dr. Gerald Pfeffer of a Barry Barrett Foundation philanthropic award for the study of the gut microbiome in amyotrophic lateral sclerosis. He is also part of a successful Krembil Foundation Team Grant looking at cerebrovascular dysfunction in Alzheimer's disease and dementia. As an investigator of the Training Grant: Health Research Vascular Training Platform led by Dr. Eric Smith, his role is to support the training and development of students and early career scientists researching vascular contributions to cognitive decline and dementia. In July 2021, Dr. Nguyen accepted the position of co-director of the Graduate Program of Neuroscience.

Dr. Bin Hu is endowed Professor in Parkinson's disease (PD) research whose scholarly work has been focused on digital health and neurorehabilitation via technological development, training, and public education and engagement. During 2021-2022, his team launched Access-Connect (ACSCON) program with the aim of providing patients with access to the most advanced digital health technology, and with connections to health coaches and other service providers within their living communities. He co-founded Calgary Academy of Digital Health Technology through collaboration with the UC Scholars Academy. Thus far, over 100 undergraduate students have been trained in using wearable devices and apps in conducting digitally enabled and medically established diagnostic tests. Tests such as 6-minute walk tests, dual task and timed up and go tests are considered gold standard clinical assessment which are however too cumbersome or costly to be delivered in conventional settings. ACSCON health coaches are

also setting up different locations or stations of service delivery across the city (e.g. gym, fitness centers, patient residential area and National Music Center) where gait training and musically motivated exercise program are being rolled out.

Dr. David Park is Professor and Director of HBI. His research program focuses on the mechanism of neural injury in stroke and Parkinson's disease (PD). He leads the Brain and Mental Health Strategy for the University of Calgary and he chairs Campus Alberta Neuroscience which knits together the three major sites of brain research in Alberta (Calgary, Edmonton, and Lethbridge). His current interests seek to understand how genes associated with PD function or dysfunction to lead to disease progression. In this regard, he has recently shown that the LRRK2 gene may play a critical role in immune function and regulation, and he is currently screening drugs for potential candidates for human trials.

Dr. Wee Yong is a Professor who co-directs the MS Brain and Mental Health Team at the HBI. He also directs the Alberta MS Network and the Global Schools of Neuroimmunology for the International Society of Neuroimmunology. These activities speak to Dr. Yong's passion for mentoring the next generation. His laboratory trainees have been outstanding, and have led publications in 2022 alone in Nature Communications, Nature Neuroscience, Nature Aging, Nature Reviews Neurology, and Nature Reviews Immunology, amongst others. Speaking to his mentorship, four of Dr. Yong's trainees have taken up Assistant Professorships across Canada since 2019. Dr. Yong's research interests have been guided by MS and glioblastomas, and findings have been translated into clinical trials in these conditions. Dr. Yong's research activities are supported by CIHR (Foundation grant), the MS Society of Canada, the USA Department of Defense, and the Canadian Cancer Society. He is a fellow of both the Royal Society of Canada and the Canadian Academy of Health Sciences.



Residents present via Zoom at Resident Research Day in 2021.

Resident Research Day

RESIDENT RESEARCH DAY, which was held on Nov. 26, 2021, is celebrated within the Department of Clinical Neurosciences and is a highlight of our Grand Rounds calendar.

Residents from Neurology, Neurosurgery, Physical Medicine & Rehabilitation and Pediatric Neurology have their abstracts and presentations judged by a panel of faculty members and the strongest are chosen for two prestigious awards.

Abstracts from 20 residents were presented in front of their peers, faculty and the judges — Dr. Mohammed Almekhlafi, Dr. Vince Gabriel, Dr. Hedwich Kuipers, Dr. Gerald Pfeffer and Dr. Rajiv Midha.

For 2021, the J. Gregory Cairncross Award for Excellence in Clinical Research was awarded to Dr. Miranda Wan for her presentation “Evolving Clinical and Epidemiological Patterns of CNS Infections In People With HIV Over 25 Years.”

The Doug W. Zochodne Award for Excellence in Basic Science Research was won by Dr. Runze Yang for his work “Detecting monocyte trafficking in brain tumors using T2* mapping.”

Congratulations to all who participated!

Neurology Residency Program

Program Director: Dr. Vikram Karnik

Assistant Program Director: Dr. Megan Yaraskavitch

Program Administrator: Christopher Smith

Number of positions per year: 4-5

Accreditation: Royal College of Physicians and Surgeons of Canada

Length of Training: 5 years

The University of Calgary Adult Neurology Residency Training Program has been dedicated to educating residents in neurology for 40 years. The program has trained over 70 neurologists since its inception in 1981 and these specialists practice neurology in community and academic institutions throughout the world.

The program currently has 20 residents, including both Canadian and international medical graduates. We emphasize the pursuit of excellence in clinical and academic neurology and instill intellectual curiosity of the discipline for the academic leaders of tomorrow.

As with all neurology programs across Canada, our program launched Competence by Design—the Royal College of Physicians and Surgeons of Canada's revamp of medical education within residency programs—in July 2020. This has facilitated learning through higher-quality, more timely, and more specific feedback to learners.

Our residents have presented their research at national and international conferences and have been the recipients of grants and scholarships for their clinical and academic pursuits. Our residents also support the learning of medical students throughout their training, either on the inpatient units, the outpatient clinics, or through teaching at the medical school, and several have received awards for their teaching from the University of Calgary.



Dr. Vikram Karnik

In July 2022, all three PGY5 residents were successful in the Royal College certification. These residents pursued fellowship programs in Movement Disorders (University of Florida, Gainesville), Behavioural and Cognitive Neurology (Mayo Clinic, Rochester), and Multiple Sclerosis (University of Calgary). Our current PGY5 residents will be writing their certification examinations in the Spring 2023 and have obtained fellowships in Critical Care (University of Calgary), Neuromuscular Medicine (University of Miami), Neuroimmunology (Johns Hopkins, Baltimore), and Movement Disorders (University of British Columbia, Vancouver).

As our program grows, the Neurology Residency Training Program at the University of Calgary evolves and adapts as we prepare our residents to become specialists in neurology, whether their primary interest is clinical or academic in an ever-changing medical landscape.

Physical Medicine and Rehabilitation (PM&R) Residency Program

Program Director: Dr. George Francis

Program Administrator: Daphne Bates

Number of positions per year: 2

Accreditation: Royal College of Physicians and Surgeons of Canada

Length of Training: 5 years

The University of Calgary Physical Medicine and Rehabilitation (PM&R) Residency Training Program strives to provide excellent educational experiences to both undergraduate and postgraduate learners. We recognize the unique privilege and responsibility of training the next generation of physiatrists, and are excited to continue to improve upon the training we provide.



Dr. George Francis

The PM&R residency program has been based on a Competence by Design (CBD) curriculum since July 2020. As a result of this major shift in medical education, residents are engaged in PM&R rotations earlier and have more timely and specific feedback to the trainees and faculty. We are constantly looking to improve in our curriculum planning, career development opportunities and tailored and individualized training experiences for our residents.

We are thrilled to have re-introduced many of our program's activities in-person that were greatly affected by the COVID pandemic. This includes on-site and interactive academic half days, journal club events, wellness retreats, our annual sectional retreat, and social events including the year-end section event. We continue to facilitate province-wide monthly Alberta Physiatry Rounds and Alberta Physiatry Association annual meetings, in collaboration with the University of Alberta.

External accreditation successfully occurred in September 2022. We have worked to maintain our program documentation, policies and resources available to all trainees and faculty, and will continue to work on continuous quality improvement based on resident feedback.

In addition to the training of physiatry residents, the Section of PM&R continues to provide support to the University of Calgary medical school in Course 2 (Musculoskeletal Medicine) and Course 5 (Neurology) teaching for small groups, lectures, and clinical skills. Many of the faculty and residents participate in teaching the medical students. In particular, Dr. Vithya Gnanakumar is the Course 2 Orthopedics Chair and Dr. George Francis is the Course 2 Evaluation Chair.

Our residents continue to demonstrate a balance of academic productivity in areas of clinical research and quality improvement projects. Residents Dr. Lauren Capozzi and Dr. Michael Poscente have recently won awards at the Alberta Physiatry Association Research Day & Department of Clinical Neuroscience Research Day, both for in-progress and completed research projects. The use of simulation as a teaching and educational tool is growing in medical education, and our program has been actively pursuing opportunities to implement its use in partnership with the Advanced Technical Skills Simulation Laboratory (ATSSL) at the University of Calgary. An important area of opportunity is Equity, Diversity & Inclusion (EDI) in medicine, and our resident Dr. Shyane Wieggers greatly contributes to the Department's EDI Committee and our departmental Health Equity Rounds.

Since the residency program's inception in 2004, our graduating PM&R residents have all successfully passed their Royal College Certification examinations. As well, all of our trainees who have challenged the licensing examinations for EMG (electromyography) and CASEM (Canadian Association of Sport Exercise Medicine) have been successful, which is a reflection of the strong partnership that Physiatry has with our neuromuscular colleagues and the excellent neurologic and musculoskeletal training that our residents receive.

Neurosurgery Residency Program

Program Director: Dr. Jay Riva-Cambrin

Program Administrator: Patti Sullivan

Number positions per year: 2

Accreditation: Royal College of Physicians and Surgeons of Canada

Length of Training: 6 years

Mandatory Research: 1 block in PGY1; entire PGY4 year or more

Education of our postgraduate and undergraduate students remains one of the highest priorities of DCNS and the Section of Neurosurgery. The teaching faculty consists of a large complement of dynamic key opinion leaders representing all subspecialties of neurosurgery, including pediatric, vascular, interventional, intracranial lesions, skull base, epilepsy, functional and peripheral nerve. In addition, the University of Calgary boasts the largest comprehensive spinal surgery program in Canada with a total of 13 full-time spine surgeons coming from both neurosurgical (5) and orthopedic backgrounds (8).



Dr. J. Riva-Cambrin

From the moment residents enter the program, they are continuously involved in research and education initiatives. Considerable resources are dedicated each year to facilitating academic activities through faculty participation, existing peer-reviewed grants, project funding from sectional and department sources, and a minimum of 12 months of clinical or basic science research. The vast majority of residents within the Neurosurgery residency training program at the University of Calgary complete an advanced degree (Masters or PhD) in basic science, clinical epidemiology, medical education, business administration, engineering, or innovation science.

A number of our residents continue to garner awards and scholarships for their outstanding clinical and academic endeavors in addition to a few celebrating engagements, marriages, and births.

Some of these include:

- **Dr. Rita Nguyen** was awarded a PhD from the University of Calgary stemming from her work with microglia after mild traumatic brain injury. She has secured a pediatric neurosurgery fellowship at Cornell University in New York.
- **Dr. Sandeep Muram** was awarded a Masters degree in clinical epidemiology from the University of Calgary examining anti-platelet therapy and endovascular stenting. He has secured a vascular /endovascular neurosurgery fellowship at Beth Israel Deaconess Medical Center in Boston.
- **Dr. Nicholas Sader** was awarded a Masters degree in clinical epidemiology from the University of Calgary examining whether QSM MRI imaging can predict concussion symptoms in children. He has secured a pediatric neurosurgery fellowship at Children's Hospital Los Angeles/USC.
- **Dr. Madeline de Lotbiniere-Bassett** was awarded a Masters degree in Engineering from Stanford University.
- **Dr. Matt Eagles** was awarded a Masters degree in Health Economics from the University of Calgary examining socioeconomic differences in acute stroke care across Canada.

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 healthy balance against a busy lifestyle choice. The University of Calgary Neurosurgery Residency Program has recently been invited to play in the 19th Annual NeuroCharity Softball tournament in Central Park, Manhattan; becoming only the second Canadian program to be invited to this prestigious event in North American neurosurgery. 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.

Research in Clinical Neurosciences

Overview

The Department of Clinical Neurosciences (DCNS) was founded in 1981 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 on patient care. The spirit of research and innovation are integral to our team and are continuously fostered. Members lead a variety of research programs—facilitated by strong partnerships with the Hotchkiss Brain Institute, 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:** 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.

Our research-focused doctors and scientists are also members of the Cumming School of Medicine, Alberta Health Services 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 faculty members publish the results of their studies in the top medical and scientific journals and they play leading roles in local, national, and international academic and professional organizations. Their efforts are supported by grants from a wide range of external agencies.

Fellowships in Clinical Neurosciences

Overview

The Department of Clinical Neurosciences (DCNS) at the University of Calgary offers one and two year basic science, clinical and/or research fellowships designed to provide enhanced broad-based clinical training and responsibility beyond the certification level, as well as clinical research opportunities.

DCNS averages 30 fellows each year who work and study in the following specialties:

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

As a joint department in both the University of Calgary and Alberta Health Services, DCNS is uniquely positioned to advance research from the laboratory directly to the patient's bedside.

These opportunities have helped the department attract fellows from a wide variety of backgrounds seeking further subspecialty experience. Their presence has enriched the clinical and academic environment for all.

We are also pleased that many of our fellows have received international awards during their fellowship training and numerous have gone on to faculty positions worldwide.

For more information on fellowship opportunities, please contact us at <https://cumming.ucalgary.ca/departments/dcms/education/fellowships>

NEUROLOGY



Katayoun Alikhani



Mohammed Almekhlafi



Farnaz Amoozegar



Camila Aquino



Simerpreet Bal



Philip Barber



Veronica Bruno



Tyson Brust



Jodie Burton



Kevin Busche



Greg Cairncross



Carlos Camara-Lemarroy



Sameer Chhibber



Prin Chitsantikul



Alicja Cieslak



Lara Cooke



Fiona Costello



Shelagh Coutts



Jephtha Davenport



Andrew Demchuk



Paula de Robles



Yanjun Duan



Hamid Ebadi



Paolo Federico



William Fletcher

NEUROLOGY



Sarah Furtado



Aravind Ganesh



Chris Hahn



Alexandra Hanson



Michael Hill



Scott Jarvis



Colin Josephson



Ronak Kapadia



Vikram Karnik



Brian Klassen



Gary Klein



Karl Martin Klein



Marcus Koch



Lawrence Korngut



Scott Kraft



Wei-Qiao Liu



Luanne Metz



Theodore Mobach



Davide Martino



Bijoy Menon

NEUROLOGY



David Patry



Dawn Pearson



Steven Peters



Gerald Pfeffer



Neelan Pillay



Tamara Pringsheim



Lisa Rosenegger



Andrea Salmon



Justyna Sarna



Shaily Singh



Eric Smith



Peter Stys



Suresh Subramaniam



Chris White



Samuel Wiebe



Scott Wilson



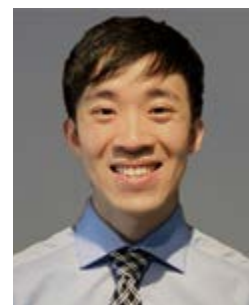
Katie Wiltshire



Megan Yaraskavitch



Michael Yeung



Jonathan Yeung Laiwah

NEUROSURGERY



David Cadotte



Steven Casha



Stephan du Plessis



Clare Gallagher



Fady Girgis



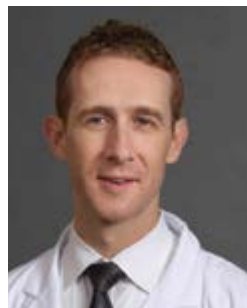
Walter Hader



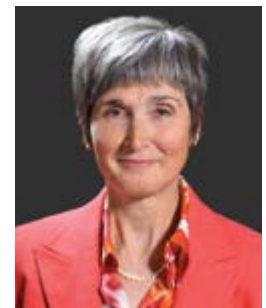
Mark Hamilton



Bradley Jacobs



John Kelly



Zelma Kiss



Rajiv Midha



Alim Mitha



Jay Riva-Cambrin



Yves Starreveld



Garnette Sutherland



John Wong



Michael Yang

PHYSICAL MEDICINE & REHABILITATION



Lee Burkholder



Rebecca Charbonneau



Darren Chiu



Elizabeth Condliffe



Chantel Debert



Nwamara Dike



Sean Dukelow



George Francis



Vincent Gabriel



Vithya Gnanakumar



Chris Grant



Arun Gupta



Denise Hill



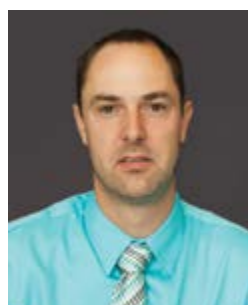
Chris Huang



Rebecca Iwanicki



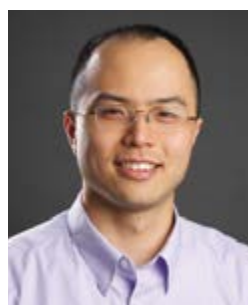
Ricky Kwok



Les LaPlante



Daniel LeBlond



Gentson Leung



Rodney Li Pi Shan

PHYSICAL MEDICINE & REHABILITATION



Jennifer Litzenberger



Andrew Malawski



Ranita Manocha



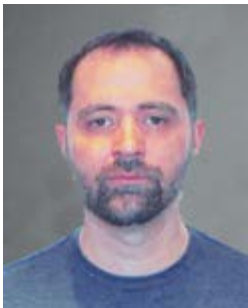
Christine McGovern



Dan McGowan



Stephen McNeil



Serge Mrkobrada



Rehana Murani



Dave Nabeta



Marcin Partyka



Stephanie Plamondon



Daniela Porter



Jordan Raugust



Paul Reglin



Nancy Scholz



Jacqui Stone



Janet Tapper



Vishal Tuls



Noorshina Virani

TRANSLATIONAL NEUROSCIENCE



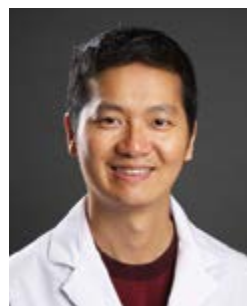
Bin Hu



Hedwich Kuipers



Oury Monchi



Minh Dang Nguyen



Shalina Ousman



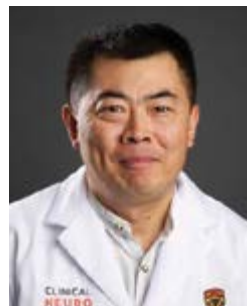
David Park



Boguslaw Tomanek



V. Wee Yong



Zonghang Zhao

EMERITUS



Werner Becker



Keith Brownell



Tom Feasby



Manuel Hulliger



John Latter



Francis LeBlanc



Terry Myles