There is only one way we can protect the brain from concussion.
Together.

Concussions are causing more harm to Canadians than ever before. However, at the University of Calgary some of the best researchers and clinicians are joining forces to explore new ways to protect the brain.

*The University of Calgary has grown into a vital community of thought leaders and visionaries. *Energize: The Campaign for Eyes High, *is our drive to positively charge our campus community, our city and beyond, to unleash the power of the University of Calgary to prevent, detect and treat concussion. And this power can only be unleashed together.*
The vast expertise of the University of Calgary is revealing the mysteries of concussion.

Inside your head is the most complicated system in the universe – the brain.

It is also one of the most delicate: a three-pound mass no tougher than Jell-O, suspended in fluid, that is extremely vulnerable to injury.

The incidence of concussion – a form of traumatic brain injury – has doubled in the last 10 years. Why? Our population is active, and also aging.

Young or old, active or not, concussion can affect anyone. In 2015, approximately three million concussions occurred in North America, making it the leading cause of brain injury.

The University of Calgary is uniquely suited to address the issue of concussion. Brain and mental health is an area of research excellence, and preventing and treating concussion and brain injury is a key priority.

Experts from the faculties of Arts, Kinesiology and the Cumming School of Medicine’s Alberta Children’s Hospital Research Institute (ACHRI) and the Hotchkiss Brain Institute (HBI) have created a collaborative, integrated approach to address concussions – one of the first such initiatives in Canada.

Your support of the Integrated Concussion Research Program will allow their expertise to flourish, helping to answer fundamental questions about concussion from prevention, to diagnosis and prognosis, to treatment and rehabilitation.

The University of Calgary and Alberta Children’s Hospital Foundation seek your support to address the issue of concussion across the research spectrum.
Together, we will find new ways to keep the brain safe.

At the helm of the Integrated Concussion Research Program is Keith Yeates, a pediatric neuropsychologist and member of the University of Calgary’s Department of Psychology in the Faculty of Arts. A member of the Alberta Children’s Hospital Research Institute and the Hotchkiss Brain Institute, and holder of the Ronald and Irene Ward Chair in Pediatric Brain Injury, Yeates is a leader in the field of traumatic brain injury in children and youth. His research focuses on the outcomes of childhood brain injury, influences on recovery and more effective treatment.

"The strength of our program in Calgary is the breadth of our research. We’re tackling every aspect—from the biology of the injury, to translating research into the health system."
— Keith Yeates

Tackling brain injury with brain power.
An important part of prevention is identifying those most at risk, including the elderly, children and individuals who have previously suffered a concussion. Concussion education is also critical to ensure families, clinicians and those involved in sports have the correct information about how the injury can occur, what the symptoms are and when more urgent care is needed.

Researchers at the University of Calgary lead in the development of new ways to prevent concussion. For example, the Faculty of Kinesiology conducts internationally recognized research, and is one of only nine International Olympic Committee (IOC) Centres of Excellence in Research in Injury and Illness Prevention in Sport in the world. Their research in key areas – injury prevention in youth sport/recreation and concussion – has reduced injuries in youth sports across the country.

By exploring how to prevent concussions, we can save people a lifetime of pain.
Together, we will protect the most vulnerable.

Helping young athletes enjoy sports without jeopardizing their future.

In 2013, Hockey Canada voted to eliminate body checking for Pee Wee (11 and 12-year-old) ice hockey players – in large part thanks to the work of Carolyn Emery and her team in the Faculty of Kinesiology. Their research demonstrated a four-fold greater risk of concussion for Pee Wee players exposed to rules allowing body checking compared to players in leagues where body checking was not allowed. The resulting national policy change is estimated to prevent 500 concussions and more than 1,000 injuries annually in Alberta. This work has informed body checking policy change locally in non-elite players in older age groups. Emery continues her youth sport concussion work with a team of researchers, clinicians and governing bodies to advance knowledge and best practice in concussion across the research spectrum.

“ONE OF OUR GOALS IS THAT HEALTH PRACTITIONERS, COACHES, TEACHERS, PARENTS AND PLAYERS HAVE A BETTER UNDERSTANDING OF CONCUSSION. RESEARCH EVIDENCE IS CRITICAL TO INFORM OPTIMAL CONCUSSION PREVENTION, IDENTIFICATION, MANAGEMENT AND REHABILITATION TO REDUCE THE PUBLIC HEALTH BURDEN OF CONCUSSION.”

CAROLYN EMERY
As we increase our understanding of who is at risk for concussions, we can prevent injuries. Working with teachers, coaches, sports medicine doctors, physiotherapists and research institutes, we will make a difference to people who have a concussion.

Brent Hagel

Together, we will save people from injury.

New study reveals who is most at risk for concussion.

Each year more than 1,000 children and adolescents in Calgary come to the Alberta Children’s Hospital with a concussion. Understanding the injury and who is most at risk will help prevent, diagnose and treat the condition. New research by a team of investigators, including Brent Hagel of the Cumming School of Medicine, has finally quantified which sports pose the highest concussion risk to youth. Carefully analyzing medical literature dating back over 30 years, the study identified the three sports with the highest risks: rugby, hockey and football. Knowing the facts about who experiences the injury will help us reduce the incidence of concussion.
Who will recover quickly, and who will have long-standing issues after concussion? Advances in diagnostic and prognostic methods are critical to further our knowledge of concussion. Because of the brain’s complexity, and the nature of concussions themselves, the injury differs from person to person. The Integrated Concussion Research Program is devising new approaches to diagnosis that will lead to faster identification of concussion, prevent re-injury and enable more effective approaches to treatment.

Concussion researchers are exploring innovative methods of diagnosing concussion and predicting outcomes, including the use of robotics, urine testing and computerized cognitive testing. Advanced imaging technologies such as MRI, transcranial magnetic stimulation and near infrared spectroscopy allow researchers to study the brain’s structure and the way it functions.

The brain also has the ability to change and heal itself, known as neuroplasticity, allowing it to rewire and fix what has been injured as a result of concussion. Researchers are focusing on the brain’s neuroplasticity to answer important questions around recovery, diagnosing injury and improving patient health.

Type 2 diabetes (another treatable condition) has the same incidence rate across the population as concussion but is funded at a 10 times higher rate.
Together, we will explore the most complex system in the universe.

We are developing new ways to look deep inside the brain.

A new imaging technique created at the Cumming School of Medicine allows researchers like Jeff Dunn to study oxygen levels in the brain, leading to an earlier diagnosis of concussion. The result is that a patient can receive treatment faster, increasing the odds for their recovery. Breakthroughs like this pave the way for future advances in imaging, specifically monitoring concussions through portable tools at hockey rinks, parks and football fields. In addition, health professionals may be able to use these techniques to accurately advise patients when they can return to their daily lives.

"WE ARE THE ONLY GROUP IN CANADA WITH THE EQUIPMENT AND SOFTWARE TO IMAGE THE BRAIN IN THIS WAY. OUR WORK IS AIMED AT DEVELOPING NEW DIAGNOSTIC TOOLS THAT WILL AFFECT THE LIVES OF PEOPLE WHO HAVE HAD A CONCUSSION."

JEFF DUNN
Together, we will put the most advanced technology to work.

“THERE ARE SO MANY QUESTIONS AND SO LITTLE THAT IS KNOWN WHEN IT COMES TO CONCUSSION. HOWEVER, THE APPROACH WE’RE TAKING THROUGH THIS PROJECT IS ALLOWING US TO USE THAT COLLECTIVE KNOWLEDGE AND EXPERTISE TO MAKE REAL CHANGE.”

SEAN DUKelow

Using robots to explore the brain.

The robotic KINARM equipment in Sean Dukelow’s lab is a crucial assessment tool for people with brain injuries like stroke, cerebral palsy and concussion. The robot runs a variety of tests related to movement, strength, reflexes and vision. People interact with the robot through a virtual reality booth – with the robot measuring their movements and storing key data. Robotics help detect concussion, as well as helping to determine when it’s safe to return to work, sport or play. Collaborative research is leading to a deeper understanding of concussion.
Because every brain is unique, concussions impact individuals differently. Some recover quickly while others experience symptoms for months after their injury. The Integrated Concussion Research Program is pooling the collective efforts of researchers to find out why.

Investigating the role of diet and exercise is furthering knowledge about predictions of long-term outcomes following concussions. Research is also helping us understand how genetic factors influence recovery. This understanding will help personalize treatment options based on severity, injury history and genetic factors.

Researchers at the University of Calgary are exploring new approaches to treatments such as physiotherapy, electrical stimulation, drug therapies and computerized rehabilitation. Combining therapies with computerized testing will target those vulnerable for injury and repeat concussions.

From reversing the effects of the injury, to rehabilitating individuals so they can resume their daily lives, the University of Calgary is sparking new discoveries in the field that will translate to improved treatments.

10-15 per cent of concussion patients are still symptomatic at three months post-injury.
Together, we will develop new treatments to heal injuries.

Treating brain injury reveals new opportunities.

Karen Barlow has been studying traumatic brain injury for the last 25 years as a pediatric neurologist. In the emergency department, she and other physicians are inundated with children recovering from concussion. The desire to see better results for her patients compelled Barlow to develop new treatments that can be implemented in rural and urban hospitals. She also leads one of the first clinical trials to test a new medical treatment for children with persistent post-concussive symptoms.

“We have one of the longest track records in Canada for investigating brain injury – from prevention, to basic science to translating clinical research into care. It’s because of this collaboration that we’ll be able to reassure parents of what to do when their child gets a concussion, how best to treat them, and improve results in the next few years.”

Karen Barlow
Together, we will help people recover more quickly.

New research by physiotherapist Kathryn Schneider with the Faculty of Kinesiology has revealed that combining therapies is more effective for individuals with ongoing symptoms after a concussion. The study’s results demonstrate that individuals who received a combined physiotherapy approach including treating the neck and balance symptoms were four times more likely to be cleared by a doctor to return to sport within eight weeks of starting treatment. The research is paving a new path forward for those with concussions, where a “hands-on active physiotherapy” approach might be more effective than the current standard of care of rest followed by gradual exertion.

New concussion treatment results in faster recovery time.

“WE HAVE MORE TO DO WHEN IT COMES TO UNDERSTANDING WHEN A CONCUSSION HAS OCCURRED AND IDENTIFYING THE BEST TREATMENTS. ULTIMATELY, THROUGH THE WORK WE’RE DOING AS A COLLECTIVE, WE’LL BE ABLE TO PREVENT THEM FROM HAPPENING IN THE FIRST PLACE.”

KATHRYN SCHNEIDER
You will help us attract the rising stars and emerging leaders who will explore innovative new ideas for addressing concussion. You will elevate Calgary in prominence as a world leader in concussion research, with the potential to affect the lives of millions in our community and beyond.

People - $8 million
A future with better outcomes for those with concussion depends on the people who will bring new discoveries to a community in need. Key to attracting and developing leaders in concussion are:

• Scholarships and bursaries that will help train the next generation of scientists across the spectrum, along with training programs specific to brain injury and concussion research
• Awards and recruitment packages that will attract the next generation of researchers and clinicians who will find new solutions to the key concussion questions

Research Foundations - $8 million
Highly integrated research teams will focus on the concussion continuum, collaborating in the areas of prevention, diagnosis and prognosis, treatment and rehabilitation. Their efforts will be supported through:

• Funding for technicians, biostatisticians, informatics specialists, neuropsychologists, research nurses and others with unique expertise
• Seed funding for new research ideas, including using biomarkers like blood to identify concussion

Tools - $9 million
Shared resources and equipment will enable research discoveries across the continuum of concussion research with funding for:

• Data management, biostatistics and registry development to enable information collection and analysis of personal data related to concussions
• Technology such as robotics, spectroscopy and clinical assessment equipment to produce key data that supports concussion understanding
• Development of website and applications to better assist with assessment and treatment following concussion

Together, we will energize the future of health.

The Integrated Concussion Research Program is rapidly advancing our understanding of concussion. Your support will help internationally respected leaders expand on existing programs, creating widespread change in the field of concussion research. We will improve outcomes across the spectrum, more effectively diagnose and treat patients with ongoing problems, and further global knowledge of the condition to prevent future injuries. The importance of this research has resulted in a partnership with the Alberta Children’s Hospital Foundation. We invite you to make an impact through investment in:

• Funding for technicians, biostatisticians, informatics specialists, neuropsychologists, research nurses and others with unique expertise
• Seed funding for new research ideas, including using biomarkers like blood to identify concussion

This is your opportunity to spark meaningful change in the world. JOIN US.

Take your place among the leading philanthropists of your time.

You will help us attract the rising stars and emerging leaders who will explore innovative new ideas for addressing concussion. You will elevate Calgary as a world leader in concussion research, with the potential to affect the lives of millions in our community and beyond.
Join us, and together we will protect the brain from concussion.