SHRED CONCUSSIONS

Community Report 2024

Surveillance in High Schools and Community Sport to Reduce Concussions and their Consequences in Youth

UNIVERSITY OF CALGARY
FACULTY OF KINESIOLOGY
Sport Injury Prevention Research Centre

PLAY SMART
PLAY SAFE
NFL

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Welcome

The Sport Injury Prevention Research Centre (SIPRC) is proud to reside and work in the Faculty of Kinesiology on the campus of the University of Calgary in Calgary, Alberta, Canada.

We acknowledge the traditional territories of the people of the Treaty 7 region in Southern Alberta, which includes the Blackfoot Confederacy (comprising the Siksika, Piikani, and Kainai First Nations), the Tsuut'ina First Nation, and the Stoney Nakoda (including the Chiniki, Bearspaw, and Goodstoney First Nations). The city of Calgary is also home to Métis Nation of Alberta (Districts 5 and 6).

Sports are a natural and beneficial part of childhood and adolescence. For many of us, sports help create some of the most lasting memories of childhood: the friends we make, the successes, the near successes, and the multitude of experiences that build personal character.

Every day, youth are at risk of injury and concussion through participation in sport and recreational activities. Frequently, they are not aware they are at risk, or of the things that could protect them from injury.

Concussions are common in youth and can have devastating impacts on individuals and families. It is estimated that 1 in 10 youth between the ages of 10-19 years of age will sustain a concussion each year.

We believe our SHRed Concussions research program can have a significant impact in reducing sport-related concussions and their consequences in youth.

We are grateful to our school and community sport partners, clincians, collaborators, teachers, coaches, and adolescents that make this possible.

Sincerely,

Dr. Carolyn Emery
Chair, Sport Injury Prevention Research Centre
Canada Research Chair (Tier 1) in Concussion
Professor, University of Calgary

SHRed Concussions Program

The Surveillance in High Schools and Community Sport to Reduce Concussions and their Consequences in Youth (SHRed Concussions) research program is a multi-year study designed to help us learn more about concussions from youth participating in sport.

The SHRed Concussions research program will help prevent concussions from happening, take care of concussions if they do happen, and develop new tools to help us know when someone has a concussion.

Youth account for over 50% of the 3 million concussions that happen in North America annually. The SHRed Concussions research program will help to reduce the number of concussions as well as the impact on daily life across all youth sport populations.

Our goal is in alignment with the National Football League's (NFL) Play Smart Play Safe program's goal to translate original research into clear clinical end-points that advantage patients and advance understanding of short and long-term effects of concussion.

The SHRed Concussions study population includes over 12,000 youth between the ages of 10 to 19 who participate in one or more high risk concussion sport. SHRed Concussions research sites are located in Vancouver, Calgary, Edmonton, Winnipeg, and Quebec City.

Reseach program participants have been recruited and have had data collected since 2019 using a custom web-based SHRed Concussions injury surveillance system. The system was developed and validated in large-scale youth sport studies, to collect annual baseline measures, track sport participation, and assess recovery following concussion.

Dr. Tyler Cluff, Associate Professor, Faculty of Kinesiology, University of Calgary

SHRed Research Focus Areas

Key Achievements

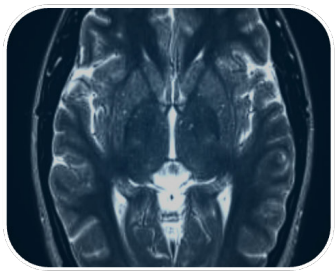
Some key achievements within each of the specific SHRed Concussion research areas in 2024 are noted below. They represent the work of more than 100 people across the various SHRed Concussion sites, from undergraduate students to principal investigators, across 17 different universities.

Prevention:

- 31 Neuromuscular Training (NMT) workshops provided to over 145 coaches.
- Preliminary research suggests that NMT may reduce concussion burden in girls' high school rugby.

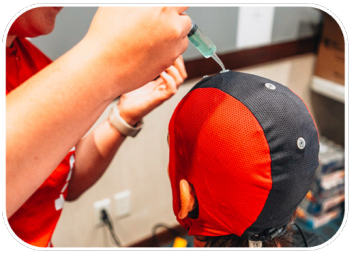
Blood Biomarkers:

- 2.561 blood samples have been collected to date.
- Blood biomarker data supports the need to examine sex and puberty specific factors that may affect post-concussion symptoms in adolescents which is relevant to recovery.



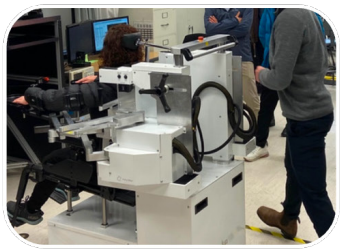
Imaging Biomarkers:

- Neuroimaging attempts to identify changes in brains where there has been a concussion to those that have not had a concussion.
- Over 300 imaging participants have been recruited, including 292 who are post-concussion and 72 with no concussion (i.e. controla).



Cardiorespiratory and Cerebrovascular Biomarkers:

- Actigraph data for more than 700 participants has been collected and preliminary results show those with more sedentary time are more likely to have delayed recovery post concussion.



Kinarm Motor Control Biomarkers:

- Approximately 24% of athletes display motor learning impairments when tested within 10 days of injury.
- 22% of athletes demonstrate ongoing motor learning impairment when they return to play.

Psychosocial Outcomes:

- Over 11,874 youth have completed a psychsocial questionnaire to date.
- Psychosocial analysis aims to understand adolescents' experiences with measures such as emotinal and peer relationships, inattention, sleep, and school and physical functioning.

Knowledge Translation:

- The SHRed Mobile was in use over 170 days in 2024 visiting schools, teams, communities to promote concussion prevention and awareness.
- An updated Massive Open Online Course (MOOC) on concussion is available at: https://kinesiology.ucalgary.ca/current-students/online-concussion-course.

Clincal Outcomes and Clinical Follow-Up:

- The Acute Sport Concussion Clinic at the University of Calgary completed 457 clinical appointments in 2024.
- Clinical assessment changes have been made in the SCAT6 in light of the Amsterdam Consensus on Concussion in Sport.

Project Highlights

2024 was another fruitful year in the SHRed Concussions research study for recruiting youth sport participants and increasing the number of baselines completed.

Unique Participant Baselines/Year of Study

Year 1-6	Total Unique Baseline Records
2019-2020	732
2020-2021	1638
2021-2022	5332
2022-2023	5153
2023-2024	4190
2024-2025	1296
TOTALS	**18341**

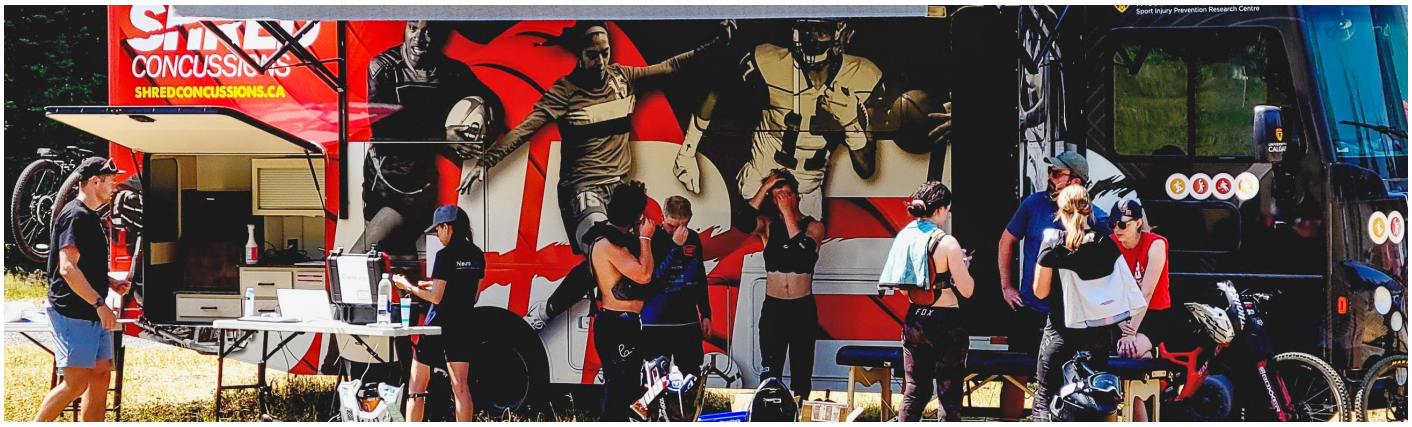
Unique Participant Baselines by First Year in Study

First Year in Study		Unique Participants	%
Year 1	2019-2020	732	5.64
Year 2	2020-2021	1431	11
Year 3	2021-2022	4510	34.7
Year 4	2022-2023	3244	25
Year 5	2023-2024	2383	18.4
Year 6	2024-2025	682	5.25
TOTAL		**12982**	

To date we have collected injury data for a total of 7,625 injuries. Of that, 2,219 were concussions and 5,406 were non-concussion injuries. Non-concussion injury data were collected to support all case-control analyses for the evaluation of injury prevention strategies such as mouthguard use and helmet fit criteria.

Injury Type	**n**	**Injury Rate (#injuries/100 participants/year)**
Concussion	2219	12.10
Non-Concussion	5406	29.47
Total	7625	41.57

12.1 Concussion injuries/100 participants/year



The SHRed Mobile at Whistler Crankworx 2024

SHRed Concussions Research Team

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York University: Alison Macpherson
University of Toronto: Nick Reed
University of Ottawa: Roger Zemek
Western University: Doug Fraser
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