



Concussions & repeated head trauma in contact sports for Australia's children and adolescents

SUBMISSION

February 2023



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Dear Committee Chair,

Thank you for the opportunity to provide input to the *inquiry*. We commend the gathering of evidence to enable transformational change to the outcomes for all Australians enduring concussion and repeated head trauma.

Concussion and repeated head trauma are **inherently different in developing children** compared to adults. Unlike adults the developing brain responds differently to concussion, and the prevention of long-term effects required child specific diagnosis, acute management, and recovery protocols.

At MCRI we are primed to understand and implement the models suitable for infants, children and adolescents experiencing concussion having led the development of clinical guidelines and digital technology to support parents, coaches, and teachers in managing concussion in children across the country.

Here we have addressed the consultation questions and provided exemplars of the work that presents a unique opportunity to transform how care for children with concussion and repeated head trauma. Together with our partners – The University of Melbourne and the Royal Children’s Hospital – we are extremely well positioned to work with policy makers, service providers, patients, and families to translate evidence-based research into better care for all.

We welcome advice as to how we can contribute to the inquiry, to ensure its inclusivity of the unique needs of infants, children, adolescents, and their families.

Yours sincerely,



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WHO ARE WE?

The Murdoch Children's Research Institute (MCRI) is one of the world's most impactful child health research institutes and sits within a purpose-built facility with its key partners - The Royal Children's Hospital and the Department of Paediatrics, University of Melbourne. MCRI is home to more than 1500 researchers working across 150 common and rare diseases and conditions affecting infants, children, and adolescents. **Concussion and brain injury is a cohesive and holistic paediatric research program** at MCRI that integrates biomedical, clinical, and psychosocial research to deliver improved treatments and outcomes for children, the adults they will become and their families. Guided by the voice of our consumers (children, families, practitioners) the program unites in the expertise of research scientists, clinicians, specialists, and onsite enablers such as the developmental Imaging team, bioinformaticians, and in house digital company to accelerate outcomes and practice change.

The **MCRI Concussion team** has expertise in knowledge generation - e.g., brain imaging, blood biomarker mechanisms and environmental factors, community education - e.g., digital health products, social media, podcasts, school talks, development of tools to diagnose and monitor concussion and its recovery - e.g., Melbourne Paediatric Concussion Scale, HeadCheck app, and multidisciplinary treatments – e.g., Concussion Essentials, Concussion Essentials Plus. Our senior leadership developed local evidence-based child concussion guidelines and to international child concussion guidelines and diagnostic tools - Child Sports Concussion Assessment Tool and Concussion Recognition Tool - that have been published and widely disseminated by peak international bodies in the field including the Concussion in Sports Group, American College of Rehabilitation Medicine, National Institutes of Health.

<https://www.mcri.edu.au/research/research-areas/clinical-sciences/brain-and-mind/concussion-research>

WHAT WE KNOW

Research reports that less than 50% of child concussions ever present for medical attention and recover without any intervention. Of those that seek medical attention, approximately 70% are symptom free within 10 days. The remaining 30% experience symptoms for longer (up to 3 months), with a very small proportion experiencing symptoms after that time. While we still have much to learn about concussion and its consequences, there are existing evidence-based guidelines (both across the lifespan and specific to children) which provide research- informed management protocols from the time of concussion through to full recovery.

7 KEY FACTS SPECIFIC TO CHILDREN

1. More than 70% recover within two weeks.
2. Concussions occur due to falls, non-contact activities (e.g., cycling, play) and contact sports.
3. Acute management in Australia is varied and not always aligned with best evidence.
 - a. many children are not treated according to best practice
 - b. most families are not provided with guidance regarding their child's recovery.
4. The causes of delayed recovery can include concussion severity, pre-injuries, family mental health and trauma response.
5. Targeted multidisciplinary intervention can accelerate recovery.
6. Evidence-based early intervention and prevention are key to accelerating recovery
7. No one treatment is effective for all child concussions. Rather, treatment needs to be targeted to the individual child's specific symptoms (physical, cognitive, mental health).

CHILD CONCUSSION: CURRENT PROBLEMS

- Children with concussion **cannot be managed as adults**.
- **Community messaging** regarding child concussion and its consequences is often sensationalised and not underpinned by evidence, resulting in increased child and parent anxiety regarding participating in sport and return to activity after injury. Noting that physical and mental health benefits of continued sports participation are critically important in childhood development and disease prevention (e.g., obesity, diabetes, stroke).
- In children, most concussions **occur outside of contact sports** (e.g., falls, non-contact sports and leisure play) so messaging requires a broader approach.
- **Evidence-based guidelines** are not adequately disseminated to front line sports and health professionals leading to unnecessary or inappropriate concussion management.
- **Variation in care**, including ability to accurately diagnose concussion can hampering recovery, and increasing patient distress, and demands on health services.
- There is a limited understanding of **predictors** of children at risk of a slow recovery (e.g., sex, age, pre-injury neurodevelopment and mental health problems, acute symptom burden, child and family anxiety).
- Limited multidisciplinary **symptom-targeted treatment methods** – which accelerate recovery post-concussion, and provide personalised, safe return to activities and sports.

WHAT CAN WE DO?

Research evidence is growing rapidly, however dissemination and implementation lag well behind. To ensure the 'facts' about child concussion diagnosis and prevention of delayed recovery are available across the community it is imperative to build a comprehensive, wide-reaching communication initiative that provides a coherent, factual message for those working with children with a concussion, and for their families, to facilitate safe engagement in sports and physical activities:

- Ensure robust accessible evidence regarding child concussion is available to the community through multiple channels – sporting codes, schools, preschools, primary health care – using state of the art population-based platforms – traditional and social media, establishing evidence-based policies for educational and sports networks. **This evidence is available (e.g., international guidelines), but not effectively disseminated and implemented at a community level.**
- Extend available research evidence, by conducting multisite, longitudinal studies that map children's recovery from concussion across into adulthood. **At the MCRI, GenV, a population-based cohort recruited at birth, provides us with an established vehicle to follow over 20,000 children through infancy and childhood, identify those who sustain concussion and compare their development to healthy children.**
- Improve knowledge of the facts regarding concussion diagnosis and recovery for health professionals (e.g., GPs, paediatricians), schools (sports teachers, school nurses) through development of high quality, accessible education materials. **This will require a concerted training program to be developed and implemented, which our recent partnership with Matterworks, a group providing education to 100s of Australian schools, will facilitate.**
- Support the implementation of evidence-based concussion policies in schools and sporting organisations to support best practice in identifying and managing child concussions and minimising unnecessary secondary consequences. **While some schools and sporting codes have already implemented such policies and processes, the majority lag behind, suggesting additional structure and support will be required to achieve broader reach.**

- For health care organisations, public and private, acute and outpatient, there is a need to establish child concussion clinics which deliver evidence-informed, multidisciplinary, symptom-targeted approaches to monitoring, follow-up, and where necessary treatment, of consequences of child concussion. **Such approaches are only now emerging in the scientific literature and have been mostly reliant on research funding to date. The work of our team provides preliminary support for such clinics with evidence that they can be effective and economically viable, reduce unnecessary child and parent anxiety and accelerate recovery. Additional funding, advocacy and training will be essential to ensure such clinics are readily available for children who sustain concussions.**

CASE STUDY

Concussion and its recovery are inherently different in children



Meet 17-year-old Emma, a netball lover that was concussed by a ball to the back of her head. It took **eight months for Emma**

to be able to complete a full week of school and recover from her concussion. Emma suffered from anxiety and hopelessness. Emma is not unique.

Research from over 90,000 children who were concussed shows us that **children take twice as long to recovery compared to adults**, with one in four children still experiencing symptoms

one month post the concussion. We now know that approximately **one third of children internalise mental health problems** such as anxiety, depression, and post-traumatic stress.

And one in five show externalising problems such as aggression, attention, and hyperactivity.

Carers, coaches, teachers, and doctors need to understand the unique effects of concussion on the developing brain and manage according.

Emma has now made a full recovery due to multidisciplinary care and is now back to playing the game she loves.