EXPLORING CONCUSSION RECOVERY OUTCOMES

WHAT IS A CONCUSSION?

A **concussion** is a brain injury caused by a hit to the head or body. Concussions can lead to a wide range of short and long-term symptoms that can affect how an athlete **thinks**, **feels** and **acts**.

CONCUSSION RECOVERY

Athletes will typically recover from a concussion within **one month** of their injury, but in some cases, recovery may take longer. Longer recovery times can negatively affect an athlete's overall health and well-being by keeping them away from the activities they love to do.

Research shows that **several factors can impact an athlete's concussion recovery** time. These factors can be broken down into:

1 Non-modifiable factors

Factors that can not be changed such as an athlete's:

- Biological sex
- Race
- Age
- Medical conditions and history

2 Modifiable factors

Factors that can be changed such as:

- Following recovery guidelines
- Seeking timely medical care
- Social support

Understanding how both modifiable and non-modifiable factors influence recovery can help us better support athletes during their recoveries.

THINGS YOU CAN'T CHANGE

Biological sex

Evidence suggests that concussions in male and female athletes are not the same. Compared to male athletes, females often have:

- **A greater number of symptoms**
- **More severe symptoms**
- **Longer recovery times**

When it comes to returning to play, this may mean that female athletes require additional time before they can safely re-engage in competitions.

A recent study found that female soccer players typically took two days longer to return to play compared to male soccer players.

-Bretzin et al., 2021

Race

There is **limited research** exploring the relationship between race and concussion recovery. However, initial research suggests that an athlete's race may influence the symptoms they experience and their recovery timeline. To ensure that athletes receive the care they need, more research should be conducted with athletes across different races to better understand how racial differences influence recovery outcomes.

Age

Children and adolescent athletes often experience **longer recovery times** following concussions compared to adults. They are also more likely to experience persistent post-concussion symptoms, which are symptoms lasting for more than one month.

Notably, children and adolescent athletes at different ages may take varying amounts of time to recover from their concussions. Sport leaders, researchers, and medical practitioners should continue to work collaboratively to tailor concussion protocols and recovery plans to the needs of each unique athlete.

Canadian researchers found that nearly 25% of youth from the ages of 8 to 12 years and 40% of youth from the ages of 13 to 17 years experience persistent post-concussion symptoms.
-Zemek et al., 2016

Medical conditions and history

Some athletes may be at a greater risk of a prolonged recovery because of pre-existing medical conditions or their medical history. While more research in this area is needed, evidence suggests that concussion history (meaning having had a past concussion), mental health challenges (for example, anxiety and depression), neurodevelopmental disorders (for example, ADHD) and migraine disorders may impact how an athlete recovers from a concussion. Knowing an athlete's medical history can help individuals create a recovery plan that meets the athlete's unique needs.

Concussion history	Mental health challenges	Neurodevelopmental & migraine disorders
Athletes with a history of concussions may experience more concussion symptoms and a longer recovery. They may also be at an increased risk of future injury.	Athletes with a history of mental health challenges and those who experience mental health challenges after a concussion may have prolonged recoveries.	Athletes with neurodevelopmental disorders and those with a history of migraine disorders may experience worse recovery outcomes.

THINGS YOU CAN CHANGE

Following guidelines: Rest and exercise

While cognitive and physical rest are typically recommended in the first **24 to 48** hours following a concussion, **rest beyond that period may be detrimental**. Research shows that athletes who take longer to get active after their concussion often have prolonged recovery times. Athletes should be encouraged to follow their sport's gradual return-to-sport protocols and appropriate return-to-school and return-to-work protocols to help them safely re-engage in their everyday activities.

DID YOU KNOW?

- An important part of cognitive rest after a concussion includes moderating screen time. Research suggests that those who moderate screen time may experience a **shorter duration** of symptoms (Chrisman, 2021). This could mean that athletes who moderate screen time can return to sports sooner after their injury.

Concussion reporting and seeking timely medical care

To help ensure that athletes receive the care and support they need following a concussion, it is important that they **seek medical care**. An athlete may delay seeking medical care, for example, because they want to wait and see if their symptoms resolve on their own. However, waiting to seek medical care may increase the athlete's risk of a prolonged recovery because they may engage in activities, like resting too much or exercising too hard, which can negatively impact their recovery.

Research suggests that athletes who do not seek medical care soon after a concussion are more likely to have a **longer recovery**.

A recent study found that athletes who waited over 1 week to seek medical care after their concussion took approximately 8 days longer to fully recover than those who sought care within the first week.
-Eagle et al., 2020

For athletes to seek medical care, they must first **report their concussion**. Unfortunately, many athletes do not report concussions for reasons like:

- Not wanting to let their team down or miss out on playing time
- Not recognizing that what they are experiencing is a concussion

With this in mind, there is a need for sports leaders and team medical trainers to emphasize the importance of concussion reporting to help ensure that athletes receive timely care. Additionally, coaches and other sports leaders should work to create environments where athletes feel supported and comfortable talking about concussions.

DID YOU KNOW?

- **Coaches** play a large role in influencing athletes' reporting behaviours. One study found that student-athletes who had coaches who discussed concussion safety in a supportive manner were **more likely** to report concussion symptoms (Milroy et al., 2019).

To help improve concussion reporting in athletes, coaches should consider discussing concussions with athletes regularly throughout the season. It may be beneficial for messaging to focus on the importance of reporting for athletes' long-term health and sport participation. Sports organizations can support coaches by providing them with relevant and up-to-date concussion training and knowledge, which can, in turn, have a positive impact on athletes.

Social support

Concussion recovery can be a difficult time for athletes. Many athletes experience feelings of loneliness and depression. These feelings may contribute to a more difficult recovery and, in turn, a longer time to return to sport post-injury.

Coaches and teammates play an important role in supporting athletes during their recovery. Little things like checking in on the athlete, asking them how they are feeling, helping them follow the return-to-sport protocols and advocating for them during their recovery can make a big difference.

Improving concussion education for all sports stakeholders can help ensure they have the knowledge and skills to better support athletes during their recovery process.

TAKEAWAY POINTS

- An athlete's biological sex, age, race and medical history may influence their recovery timeline after a concussion.
- Personalized recovery plans are needed to help ensure that athletes do not return to sports too soon after their concussion.
- Concussion reporting, seeking timely medical care and following return-to-play protocols can all help ensure that athletes get the supports they need to return to sport safely and promptly.
- Support from teammates and coaches can help reduce some of the emotional disturbances athletes face after a concussion, leading to less complicated recoveries.
- Increasing concussion education and awareness of proper return-to-play protocols are ways to help ensure that athletes receive the care they need as they recover.

For more information, please read the full literature review which is available on the SIRC concussion hub at sirc.ca/concussion or contact the SIRC team at info@sirc.ca .

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