

Sport Concussion in New Zealand: National Guidelines

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A Special Thanks

The National Concussion Guidelines were produced by ACC in consultation with a panel of medical, sport, and research experts listed below, and have been formally endorsed by the following organisations.

Expert Panel Members

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Dr John Mayhew, Medical Director for New Zealand Rugby League

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Endorsing Organisations



This guideline document has been produced to inform and assist National Sports Organisations (NSOs), and recreation, education, and health organisations in their development of specific policy for concussion in community, non-elite, or grassroots sport.

The guidelines are intended to provide background information to inform the development of individual sport Concussion Awareness Policies. ACC has developed a Concussion Awareness Policy template intended to facilitate the development and application of a sport-specific concussion policy, with the purpose of:

- a) Increasing the awareness of concussion within sport, the community, and its supporters;
- b) Providing guiding principles and general advice regarding concussion recognition and management; and
- c) Increasing awareness of the process by which a player may continue to participate or return to sport following a suspected concussion.

This guideline has been developed to ensure safety in community sport where there is minimal and often delayed access to medical support. This will be different to environments where there is a high level of dedicated medical support, for example elite sport. Organisations should refer to High Performance Sport NZ (HPSNZ) Standard Operating Procedures for the Clinical Management of Concussion in elite sport.

This guideline was produced by ACC in consultation with a panel of medical, sport, and research experts and was informed by the 2022 Amsterdam Consensus Statement on Concussion in Sport.

Developing a 'Concussion Awareness Policy'

National Sport Organisations (NSOs) and other relevant organisations should develop a concussion policy and education strategy to ensure their members and broader community are aware of how to appropriately support suspected and confirmed concussion.

- It is important that there is a standardised approach to concussion in sport because concussion is a serious injury.
- The annual estimate of head injuries in New Zealand is approximately 36,000.
- In 2022, ACC received claims for 6,440 sport-related concussion injuries.
- It is estimated that there is a 30% under reporting of concussion.
- The highest number of sport-related concussions occur in team-based sports (e.g., rugby, football, basketball) and from biking and equestrian activities.

A standardised approach to increasing awareness of the recognition and management of concussion will minimise the likelihood that individuals have a poor outcome from the injury, supports best practice, and provides confidence to parents/caregivers of young people involved in sport.

ACC can support NSOs in the development of a concussion policy, implementation plans, and education material with review by an 'expert panel'. This can help with the goal of ensuring a consistently high standard of recognition and management of concussion across New Zealand. Please contact Sportsmart@acc.co.nz to request support.

The ACC Concussion Awareness Policy template may be used by NSOs to create their respective policies.

Key Messages

Concussion is a brain injury that affects the function of the brain and the person, and may or may not result in a loss of consciousness.

There are several important features to highlight including:

- a) A concussion is not always caused by a direct hit to the head. It may be caused by a direct hit to the head, face, neck or elsewhere on the body with an 'impulse' force transmitted to the head.
- b) Only 10% of concussions result in a loss of consciousness.
- c) A concussion typically results in the rapid onset of short-lived impairment of neurological (brain cognition) function that resolves spontaneously.



General Principles

- Early removal and early access to care reduces recovery time.
- Extra caution is required for child, adolescent, and female athletes as they take longer to recover.
- Everyone has a role to play in supporting the recognition and management of concussion.



Recognise and Remove

- If a suspected concussion occurs, after checking for neck injury, remove the athlete from play/activity **immediately** and seek assessment by a health practitioner.
- Members of the player's and athlete's whānau and wider community (parents, coaches, team-mates, sporting organisations) have an important role to play in recognising the signs and symptoms of concussion.
- Individuals must **NOT** return to sport/activity on the day of a suspected concussion.



Refer

- Individuals suspected of suffering a concussion must have an assessment with a health practitioner (e.g., an urgent care doctor, ED doctor, GP, nurse practitioner, sports and exercise physician) for confirmation or exclusion of a concussion and consideration of other diagnoses.
- Those with 'RED FLAGS' (see page 5) must seek urgent medical help (go to an Accident and Emergency clinic or hospital).
- If there is significant concern about the degree of severity of the injury it may be necessary to call an ambulance (111).



Red Flags (require urgent review)

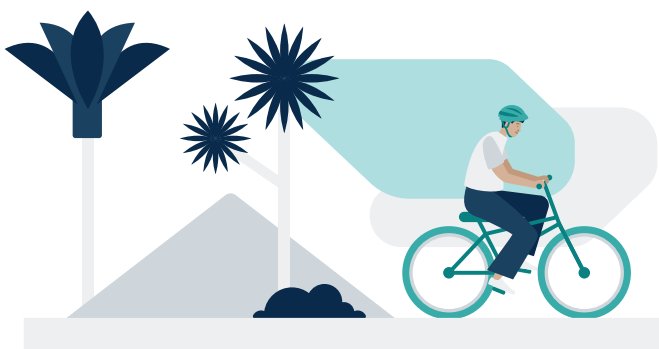
- Complaint of neck pain.
- Increasing confusion or irritability.
- Repeated vomiting.
- Weakness or tingling/burning in arms or legs.
- Deteriorating after being injured — increased drowsiness, headache or vomiting.
- History of bleeding disorder.
- Loss of consciousness or seizures.
- Severe or increasing headache.
- Unusual behaviour (different from normal).
- Double vision.
- Anyone who has inadequate supervision post-injury.
- Visible skull deformity.
- History of regular medication use that could result in prolonged bleeding (e.g., Warfarin, Aspirin).



Recover

- Treatment is most effective when initiated early.
- The effects of concussion can interfere with an individual's ability to learn or to function well at work.
- Return to education/work needs to be graduated, and work activities altered to reflect the level of function. This should be guided by a health practitioner experienced in ongoing concussion management (e.g., an urgent care doctor, ED doctor, GP, nurse practitioner, sports and exercise physician).
- Typical management includes physical and cognitive rest for 24-48 hours (including reduced electronic screen use), prior to initiating a graduated programme of progressive physical and cognitive activity.
- Strong evidence supports the benefits of aerobic exercise at a level that does not worsen symptoms during the activity as an early intervention treatment within a recovery plan.
- Return to competitive sport must only occur after progressive physical activity (see later stage explanation) and return to education/work and social activities.
- Where symptoms are prolonged (e.g., >4 weeks) or graduated activity has not been tolerated, the person needs to be referred to a health practitioner* that can review the diagnosis, taking into consideration the potential traumatic and non-traumatic causes for ongoing symptoms (e.g., a GP, sports and exercise physician, neuropsychologist, specialist physiotherapist, nurse practitioner). You should ensure the person has registered with ACC for support.
- The health practitioner may refer the person to ACC concussion services if they meet certain criteria. This is a service that offers comprehensive support (specialist physiotherapy, occupational therapy, neuropsychology) to guide symptom management and return to activity.

* These health practitioners differ to those outlined on page 3 and are more specialised in concussion management for those patients that are still having symptoms >4weeks.



Return to Sport

- Concussion management should be guided by a healthcare practitioner experienced in ongoing concussion management (e.g., a GP, sports and exercise physician, neuropsychologist, specialist physiotherapist, nurse practitioner).⁸ This includes the timing of progressions and clearance to return to sport.
- A conservative approach to return to sport is recommended for adoption across sports in New Zealand. Return to sport-related activity should be progressed more slowly with children, adolescents and females. This approach is aligned with international literature that now recognises more time is needed to recover from concussion than earlier statements had indicated. A safe return to sport following a concussion typically occurs within one month of injury in children, adolescents, and female adults.
- All athletes diagnosed with concussion should go through a graduated return to education/work and sport programme (Appendix 1) guided by a healthcare practitioner experienced in the management of concussion and implemented by those involved with the team/sport (e.g., coaches, physical trainer, teacher, parent/caregiver etc.). Athletes should have fully returned to school or work and social activities before returning to contact-based training or sport-specific competition.
- **Members of the player's and athlete's whānau and wider community (parents/caregivers, coaches, team-mates, sporting organisations) all have a role in facilitating the comprehensive return to sport process by providing support.**
- It is suggested that anyone (player, athlete, rider) who has sustained multiple concussions (defined as ≥ 3 in one season or >5 during their sporting career) has a review from a clinician with expertise in managing sport-related concussion (for example a sport and exercise medicine physician, neurologist, or neuropsychologist) before returning to sport.
- **Clearance by a health practitioner is strongly recommended before returning to contact-based and sport-specific training (i.e Stage 5), or full competition (Stage 6).**

The following requirements must be met for an individual to return to sport-specific training (i.e Stage 5).

The individual:

- a) has returned to and is tolerating full time work or learning.
 - b) has been **symptom free at rest for 14 days** and has completed up to and including **Stage 4**.
 - c) is a **minimum of 14 days post-injury** (Day 0 = Day of injury).
- The following factors should be satisfied for a return to competitive sport/play (Stage 6):
 - a) The individual remains **symptom free at Stage 5** of the graduated return to education/work and sport protocol.
 - b) The individual is at a minimum of **21 days post-injury**.
 - c) Whilst not mandated, it is still advisable for the individual to have received clearance from a health practitioner experienced in concussion management.

Appendix One

Day 0 = Day of the injury/concussion

Graduated return to education/work and sport protocol

Stage 1	Days 1-2		Relative rest for 24-48 hours (i.e light activities of daily living that do not provoke symptoms are ok) <ul style="list-style-type: none"> • Minimise screen time • Gentle exercise (i.e. walking around the house)
Stage 2		Minimum of 24 hours between stages before progressing Symptoms should be progressively improving If symptoms worsen drop back a stage	Gradually introduce daily activities <ul style="list-style-type: none"> • Activities away from school/work (introduce TV, increase reading, games etc) • Exercise — light physical activity (e.g., short walks outside)
Stage 3			Increase tolerance for mental and exercise activities <ul style="list-style-type: none"> • Increase study/work-related activities with rest periods • Increase intensity of exercise guided by symptoms
Stage 4			Return to work/study and sport training <ul style="list-style-type: none"> • Part time return to work/education • Start training activity without risk of head impact
Stage 5	Earliest Day 14		Return to normal work/study and sport-specific training <ul style="list-style-type: none"> • Completion of Stages 1-4 AND • Fully reintegrated into work or school AND • Symptom free at rest for 14 days • AND ≥ Day 14 post-injury → reintegration into full sport-specific training can occur
Stage 6	Earliest Day 21		Return to sports competition <ul style="list-style-type: none"> • Completion of Stage 5 AND • Symptom free during sports training • AND ≥ Day 21 post-injury • AND whilst not mandated, it is strongly recommended for the individual to have received clearance from a health practitioner experienced in concussion management

Recommended Reading

Feigin, V, Theadom, A. et al (2013). Incidence of traumatic brain injury in New Zealand: A population-based study. *The Lancet Neurology*, 12(1), 53-64.

Theadom, A, Starkey, N, Dowell, A, Hume, P, Kahan, M, McPherson, K, & Feigin, V. (2014). Sports related brain injury in the general population: An epidemiological study. *Journal of Science and Medicine in Sport*, 17(6), 591-596. doi: 10.1016/j.jsams.2014.02.001.

Patricios, JS. et al. (2023) Consensus statement on concussion in sport: The 6th International Conference on Concussion in Sport held in Amsterdam, October 2022. *British Journal of Sports Medicine*, 57(5), 695-711.

Theadom, A, Parag, V, Dowell, T, McPherson, K, Starkey, N. & et al. (2014). Persistent problems one year following traumatic brain injury within a population based incidence and outcomes study.

Kara, S, Crosswell, H, Forch, K, Cavadino, A, McGeown, J and Fulcher, M. (2020), Less than half of patients recover within 2 weeks of injury after a sports related mild traumatic brain injury: A 2 year prospective study. *Clinical Journal of Sports Medicine*, 30(2), 96-101.

UK Government (April 2023) UK Concussion Guidelines for Non-Elite (Grassroots) Sport.

It is intended to formally review this document prior to end of 2027.

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