

Paediatric concussion in general practice

**Bianca Charles, Taylor Mills, Gill Cowen,
Michael Takagi, Katie Davies, Gavin A Davis,
Vicki Anderson**

Background

General practitioners (GPs) have a key role in concussion diagnosis and management. Recent surveys have shown that GPs are competent in diagnosis but lack confidence in appropriate concussion management. Although some patients recover spontaneously, early education is valuable, and provision of evidence-informed, individualised management plans may facilitate recovery within typical recovery windows.

Objectives

The aim of this article is to provide GPs with contemporary recommendations on paediatric concussion diagnosis and management in the acute and subacute phases, and to highlight the benefit of a biopsychosocial approach and multidisciplinary management.

Discussion

Paediatric concussion management can be complex, requiring a biopsychosocial approach, including a thorough understanding of each individual paediatric patient's pre-concussion history. Given the relationship GPs have with their patients, they are well placed to coordinate multidisciplinary care. For paediatric patients who are at risk of a prolonged recovery or persisting symptoms, early identification and referral for multidisciplinary care are essential.



MILLIONS of children and adolescents experience concussion annually, but fewer than 50% present for medical assessment.¹ The general practitioner (GP) is often the first point of care in local clinics, urgent care centres and Aboriginal medical services or, particularly in regional and rural Australia, via emergency departments.² One in five adolescents sustains a concussion prior to completing high school; this is most commonly sport related.³⁻⁵ For younger children, most concussions occur at home or school.

Concussion occurs when an injury to the head or body results in an impulsive force being transmitted to the brain, triggering a cascade of cerebral cellular processes.^{6,7} Symptoms occur either immediately post-injury or evolve within hours or days and are not accounted for by other factors. Acute signs are transient and may include seizure activity, unresponsiveness, tonic posturing, ataxia, poor balance, confusion, behavioural changes and amnesia.⁶ Symptoms vary and can be classified into clusters: somatic/physical, cognitive, emotional or sleep related.

For most children and adolescents who seek medical attention, symptoms will resolve within 4 weeks; however, approximately 30% experience prolonged symptoms.⁸ These are referred to as persistent post-concussion symptoms (PPCS).⁵ Symptom severity is the most consistent predictor of delayed recovery, whereas preinjury migraine and neurodevelopmental or mental health concerns are additional risk factors for PPCS,^{5,9} as is parental anxiety.¹⁰

The GP's role is crucial in managing safe return to activities of daily living, but this is challenging as knowledge surrounding concussion diagnosis, management and guidelines varies significantly, and diagnostic confidence relates to exposure to patients with concussion.¹¹ We present a summary of a GP model of care (Table 1).

Diagnosis: Recognition and assessment

Concussion diagnosis requires clinical assessment, including a detailed history (including a parent, carer and/or witness) confirming a plausible mechanism of injury and post-concussion symptoms.⁷ Symptoms of concussion can include headaches, dizziness, cognitive issues and emotional lability. Younger children

(ie under 8 years of age) may be unable to report their symptoms, and therefore behavioural or physical observations – such as social withdrawal, clinginess, excessive fatigue or the child holding their head or stomach – provided by parents/carers will help guide clinical management. Understanding of a child's development and current learning history as well as other comorbidities such as attention deficit hyperactivity disorder is important; any pre-existing conditions may be amplified post-concussion. In infants and young children, changes in sleep patterns, behaviour and interest levels may also assist with diagnosis.

Physical examination should: (1) identify any focal neurological signs or indicators of possible cervical pathology; and (2) assess for common signs (eg impaired cognition

and/or recall, vestibular and/or oculo-motor disturbance, impaired balance, orthostatic changes or altered mental state), while taking into account pre-existing conditions that may complicate assessment (eg astigmatism or need for corrective glasses). Initial signs and symptoms should be documented and monitored over time.⁷

Use of validated symptom checklists or questionnaires at the initial assessment and while monitoring recovery can be valuable for management (Table 2).

Initial management

Community knowledge regarding concussion is poor, with 34% of parents having no or very limited knowledge about concussion.⁴ During the acute period,

education and reassurance regarding the transient nature of concussion, typical recovery and expected trajectory of symptoms are key. Lack of knowledge and understanding around concussion increases parental anxiety, which affects the child's recovery.¹⁰ GPs play a prominent role in primary provision of concussion education, with their holistic patient knowledge being key to understanding the unique needs of each child/family. Initial education should also include explanation that current evidence does not support the routine use of intracranial imaging or blood tests in the diagnostic work-up.⁷

Following concussion, current guidelines recommend relative rest (a period of reduced activity but not strict bed rest) during the first 24–48 hours.¹² Importantly, previous recommendations for prolonged rest have been shown to delay recovery.^{13,14} In the acute recovery period, the focus should be to support the individual to return to their usual physical and cognitive activities in a graded way. In most instances, school return should be prioritised prior to extracurricular activities. It is a parent's responsibility to inform the school of a concussion, and the family and the school should communicate regularly during the child's recovery regarding recommended accommodations, which need to be appropriate to the child's symptoms and will evolve with stage of recovery.

There are currently no validated concussion-modifying pharmacological agents for use acutely. Treatment should focus largely on child and parent psychoeducation, with individualised treatment aimed at restoring pre-injury sleep patterns and a graded return to the individual's normal activity levels.¹⁵ Parents can be advised that simple analgesia (paracetamol or ibuprofen) may be helpful in the short term for relief of physical symptoms (eg headache) but should be avoided over extended periods. Avoidance of opioid medication and benzodiazepines is advised.

Sleep management

Sleep disturbance and associated fatigue are common following paediatric concussion and recognised as modifying factors that can lead to persisting symptoms if not addressed acutely.¹⁶ Evidence suggests

Table 1. Summary of the general practitioner (GP) model of care of paediatric concussion

If initial presentation within first 14 days of concussion

Visit 1	Recognition of concussion and identification of red flags for escalation, use of symptom checklist, education and general activity advice.
Visit 2 (within weeks 1–3)	Symptom monitoring, further education, progression of activity, possible multidisciplinary referral if symptoms are not improving or are increasing.

If initial presentation beyond first 14 days of concussion

Visit 1	Recognition of concussion and analysis of activity levels and symptoms. Consider multidisciplinary referral.
---------	--

Subsequent management for all patients

Ongoing visits	Symptom monitoring and management in conjunction with other practitioners, including allied health and other medical specialists. Patient education is ongoing.
Final visit	Once symptoms have fully resolved (back to baseline) at rest and post-exertion, clearance for return to high-risk activities is addressed. If required, return-to-play clearance is provided. If concerns persist regarding individual risk for return to play, non-GP specialist referral may be required.
Considerations:	<p>Consider multidisciplinary team early management as required particularly if there is:</p> <ul style="list-style-type: none"> • slow return to activity • increased or new symptoms • presentation of migraine, mood disturbance/post-traumatic stress disorder • comorbid diagnoses. <p>Given GP time constraints, consider using practice nurses to administer symptom checklists prior to the GP consultation. Other elements of concussion management may also be delegated.</p>

a bidirectional relationship between other concussion symptoms and sleep disturbance, with cognitive symptoms, headache, mood disturbance and fatigue being examples of symptoms commonly exacerbated by sleep disturbance.¹⁷ GPs are skilled in evaluating sleep and providing appropriate initial sleep hygiene advice to the parents and the child. Pre-existing sleep difficulties may

vary depending on a child's age, and an understanding of pre-existing sleep routines and how they have changed post-concussion is crucial. Adolescents may have pre-existing poor sleep hygiene, and sleep hygiene advice should generally aim to keep sleep schedules as close to normal as possible. Reducing the use of screens, especially prior to bedtime, should be encouraged.

Return to learn

For children and adolescents, returning to school and learning is a vital part of recovery and involves a stepwise process, gradually increasing cognitive load and allowing for mild, brief symptom provocation. Most students achieve a full return to school and learning without accommodations. Those with PPCS may require modifications including

Table 2. Tools to assist with concussion recognition and recovery

Name of tool	Function	Where to access
Concussion Recognition Tool 6 (CRT6)	Community tool – for non-medical people to recognise possible concussion and to safely remove an athlete from the field of play. ²⁷	https://bjsm.bmj.com/content/bjsports/57/11/692.full.pdf
HeadCheck app	Community-facing digital health application. Includes the CRT6 sideline concussion check, monitoring symptoms and uses Concussion in Sport Group guidelines to provide management and recovery education to 4 weeks post-injury. ²⁸ This was developed for the paediatric population. Once the age of the individual is identified, guidance is tailored to this age.	www.headcheck.com.au/download
Sport Concussion Assessment Tool-6 (SCAT6) and Child SCAT6	For use by medical practitioners: <ul style="list-style-type: none"> • SCAT6: for ages 13+ years • Child SCAT6: for ages 8–12 years Best used in the acute period (first 72 hours). ^{29,30}	SCAT6: https://bjsm.bmj.com/content/bjsports/57/11/622.full.pdf Child SCAT6: https://bjsm.bmj.com/content/bjsports/57/11/636.full.pdf
SCOAT6, Child SCOAT6	Used during subacute period (>72 hours). ^{7,31} For multidisciplinary assessment. The general practitioner delegates some components to allied health practitioners.	SCOAT6: https://bjsm.bmj.com/content/bjsports/57/11/651.full.pdf Child SCOAT6: https://bjsm.bmj.com/content/bjsports/57/11/672.full.pdf
Melbourne Paediatric Concussion Scale (MPCS)	Validated symptom questionnaire modified from the Post Concussion Symptom Inventory (PCSI) checklist. ³²	https://concussion.scholasticahq.com/article/118080-improving-subacute-management-of-post-concussion-symptoms-a-pilot-study-of-the-melbourne-paediatric-concussion-scale-parent-report

Table 3. Valuable resources and guidelines

Resource/guideline	Location of resource
Concussion In Sport Group	www.concussioninsportgroup.com/resources
ANZ Concussion Guidelines	https://anzconcussionguidelines.com/toolbox-sidebar https://kidsconcussion.com.au
HeadCheck website	www.headcheck.com.au
The Living Guideline for Pediatric Concussion	https://pedsconcussion.com
The Australian Concussion in Sport guidelines	www.ausport.gov.au/concussion
Paediatric Research in Emergency Departments International Collaborative (PREDICT) and Pediatric Emergency Care Applied Research Network (PECARN) emergency department guidelines ^{33,34}	www.predict.org.au/head-injury-guideline www.mdcalc.com/calc/589/pecarn-pediatric-head-injury-trauma-algorithm

curriculum, environmental, physical and testing accommodations (Figure 1). For a small proportion of children and adolescents with PPCS, cognitive testing may be helpful, but it is not recommended while significant symptoms persist, as these will limit participation and tolerance. Best practice involves a coordinated approach with liaison between the GP, other healthcare providers, child and

family and school. Emphasis should initially be placed on returning a child to the school environment for social purposes rather than emphasising returning to learn. Often older children experience a significant pressure to perform academically in their final years. During recovery, it should be emphasised that this is not the focus, and appropriate accommodations should be enlisted (Figure 1).

Return to physical activity/sport

Stepwise return to physical activity assists with managing post-concussion symptoms. It is safe and beneficial to commence light physical activity within 24–48 hours of a concussion.¹² This helps manage fatigue, sleep, mood and physical symptoms. This process occurs in tandem with returning to daily activities and learning (Figure 2).

The first stages of return to sport include symptom-limited activity with light-moderate aerobic exercise prior to commencing sport-specific drills. Mild symptom exacerbation is accepted during the first three stages, and individuals will progress through these at different rates.⁷ If there is minimal progression, consider early referral to a physiotherapist experienced in concussion management. It is recommended that children and adolescents participate in exercise daily for 20–30 minutes post-concussion, which can include playing with friends, participating in more structured cardiovascular programs or attending non-contact training. Benefits of participation in regular exercise and return to sport include positive effects on mental health and social participation.

An individual must be symptom free at rest and post-exertion and have returned to other cognitive and physical activities prior to obtaining medical clearance from their GP for return to contact sport practice and unrestricted play.^{7,17}

The role of multidisciplinary management for paediatric PPCS

Many symptoms of concussion are non-specific and common in the general population (eg headache). Such symptoms can be exacerbated post-concussion because of biopsychosocial factors (eg anxiety, stress),¹⁸ where symptoms arise from complex dynamic physiological, environmental, psychosocial and contextual factors, with pre-injury illness, family interactions and experiences all playing roles.^{7,19} Given parental anxiety has been identified as a contributing factor for development of PPCS, caregivers must be involved early and throughout concussion recovery. The GP is well placed to identify individuals who may be experiencing symptoms unrelated to their concussion but attributing these to their injury.

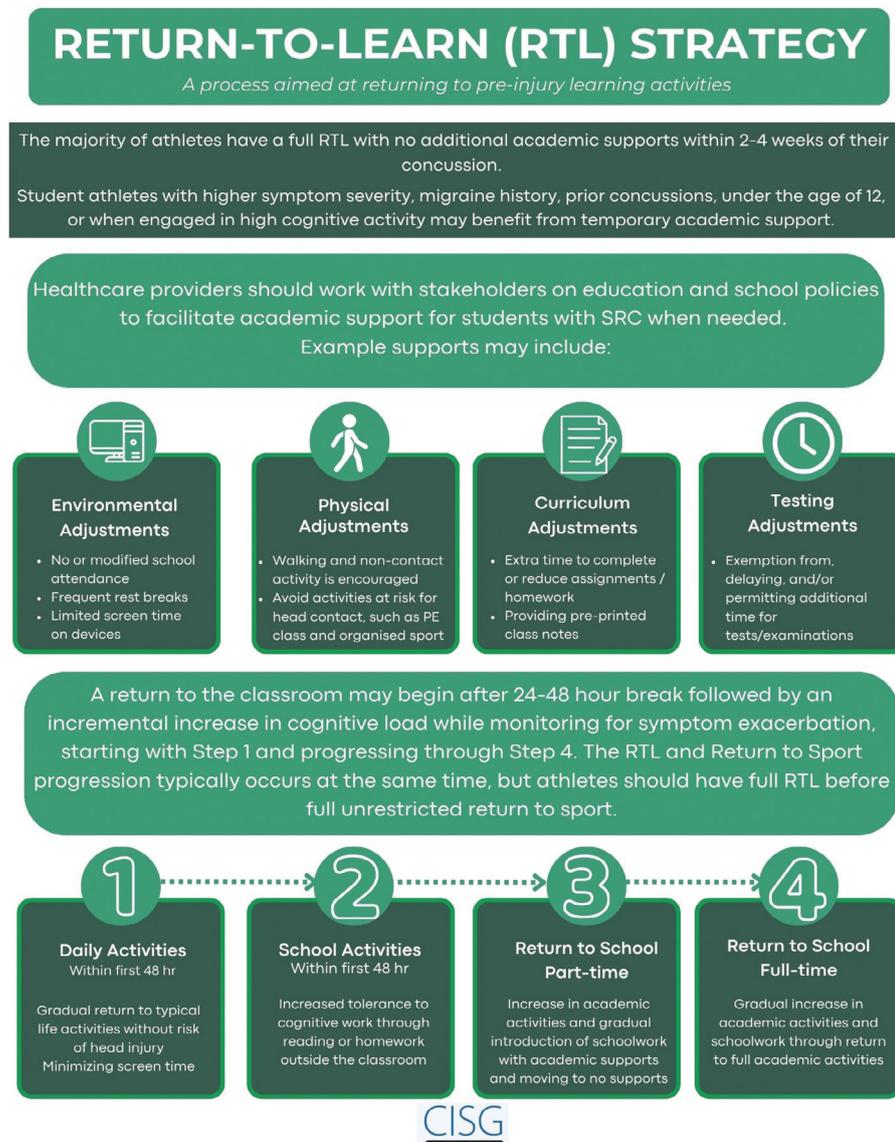


Figure 1. Return to learn strategy.⁷

Reproduced with permission of Professor Jon Patricios on behalf of Concussion in Sport Group and *British Journal of Sports Medicine*.

The differentiation of such symptoms is crucial to the provision of appropriate care.

When symptoms persist, biopsychosocial management with a multidisciplinary team (in person or using telehealth) is recommended.⁷ However, these resources are scarce in the community. At a minimum, GP-led multidisciplinary care coordination involving concussion-trained allied health practitioners is crucial, and it is recommended

that GPs familiarise themselves with such practitioners available locally and via telehealth. It is also beneficial for GPs to familiarise themselves with available resources and guidelines (Table 3).

Physical symptoms are often driven by visual, vestibular, cervical or autonomic system dysfunction or sensitivities. If symptoms such as headache and or/ neck pain or dizziness persist after 10 days,

referral to a physiotherapist with expertise in concussion assessment and management and/or additional vestibular training for systematic assessment and treatment should be considered.^{7,20} Systematic physiotherapy assessment can guide targeted treatment, including oculomotor function, habituation exercises or cervical treatment.²¹ With suspected autonomic dysfunction, a submaximal exertion test may be completed, and individualised heart rate-based sub-symptom threshold aerobic exercises provided.¹² Physical therapy can guide graduated return to leisure and sport activities including high-risk activities such as contact sport, cycling or equestrian sports, where sport-specific drills incorporating dual tasking and decision making are completed to ensure readiness for medical clearance prior to returning to (contact) training and playing.⁷

Physical and cognitive symptoms of concussion can lead to low mood and high levels of anxiety.²² In turn, these psychological symptoms can compound the physical symptoms.^{23,24} This bi-directional relationship can lead to a self-perpetuating cycle. In adolescents and children who are going through several pertinent developmental changes, concerns about self-identity, school performance and social changes can exacerbate symptom persistence. Recent evidence has described the effectiveness of early psychological intervention in breaking this cycle.^{25,26} The mechanisms by which these modalities assist in treatment for PPCS include addressing unhelpful thinking patterns, such as catastrophising, and promoting graded return to meaningful activity. GP concern that maladaptive thinking styles or avoidance behaviours may be delaying recovery warrants referral to a psychologist.

In conclusion, paediatric concussion management is multifaceted, requiring a comprehensive biopsychosocial approach. A detailed history of the individual's symptom trajectories, relevant medical history, current activity levels, sleep patterns and psychosocial history is required to guide clinical decisions. GPs are well placed to lead this approach, as they have an understanding of each individual paediatric patient's pre-concussion history and the health beliefs of their family/caregivers. GP-led skilled coordination of complex multidisciplinary



Figure 2. Return to sport strategy.⁷

Reproduced with permission of Professor Jon Patricios on behalf of Concussion in Sport Group and British Journal of Sports Medicine.

concussion care will result in optimisation of outcomes in paediatric concussion.

Key points

- Paediatric concussion is a common presentation to emergency departments and primary care settings.
- Following diagnosis, the initial management should include psychoeducation, return-to-activity advice (including learning and sport) and sleep hygiene (if appropriate).
- Occurrence of PPCS is common, affecting one in four paediatric patients with concussion, who will benefit from multidisciplinary management.
- Multidisciplinary management should involve a team of practitioners coordinated by the GP and may include paediatric medical specialists, physiotherapists, other allied health and mental health clinicians.
- Early referral is recommended if there is a lack of progress with returning to activities, if patients are not responding to treatment or if symptoms persist or worsen.

Authors

Bianca Charles MPhysioPrac, Clinic Lead Physiotherapist, Clinical Sciences, Murdoch Children's Research Institute, Melbourne, Vic; Deputy Lead Physiotherapist, Neurological Rehabilitation Group, Melbourne, Vic

Taylor Mills BA (Hons), Research Psychologist, Clinical Sciences, Murdoch Children's Research Institute, Melbourne, Vic

Gill Cowen MBBS, Senior Lecturer, Curtin Medical School, Curtin University, Perth, WA; Senior Research Fellow, Curtin School of Population Health, Curtin University, Perth, WA; Senior Clinical Research Fellow, Curtin Medical Research Institute, Curtin University, Perth, WA

Michael Takagi PhD, Honorary Research Fellow, Clinical Sciences, Murdoch Children's Research Institute, Melbourne, Vic; Senior Lecturer, School of Psychological Sciences, Monash University, Melbourne, Vic

Katie Davies BPhy, Lead Physiotherapist, Clinical Sciences, Murdoch Children's Research Institute, Melbourne, Vic; Principal Physiotherapist & Managing Director, Neurological Rehabilitation Group, Melbourne, Vic

Gavin A Davis MBBS, Honorary Professor, Clinical Sciences, Murdoch Children's Research Institute, Melbourne, Vic; Neurosurgeon, Department of Neurosurgery, Austin and Cabrini Hospitals, Melbourne, Vic

Vicki Anderson PhD, Director, Clinical Sciences, Murdoch Children's Research Institute, Melbourne, Vic; Adjunct Professor, Monash University, School of Psychological Sciences, Melbourne, Vic; Honorary Psychologist, Psychology Service, The Royal Children's Hospital, Melbourne, Vic

Competing interests: GAD is a member of the Scientific Committee of the 6th International Consensus Conference on Concussion in Sport; he is an honorary member of the Australian Football League Concussion Scientific Committee; he is section editor, Sport and Rehabilitation, Neurosurgery; and he has attended meetings organised by sporting organisations including the National Football League, National Rugby League, International Ice Hockey Federation and Fédération Internationale de Football Association. GAD has not received any payment or research funding from these groups other than for travel costs. VA is a board member of the International Concussion in Sport Group and executive committee member of the International Brain Injury Association. GC is a committee member for WA Football, sitting on the Football Affairs Committee. She is also a founding member of the Western Australian Concussion Network. GC has consulted to Connectivity Traumatic Brain Injury Australia on a voluntary and paid basis. She was a paid member of the expert advisory panel providing advice regarding the Medical Research Future Fund Traumatic Brain Injury Roadmap and Implementation Plan (2024–2025).

Funding: VA is funded by a National Health and Medical Research Council Investigator Fellowship.

Provenance and peer review: Commissioned, externally peer reviewed.

AI declaration: The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

Correspondence to:

Biancac@neurorehab.com.au

References

1. Bryan MA, Rowhani-Rahbar A, Comstock RD, Rivara F; Seattle Sports Concussion Research Collaborative. Sports- and recreation-related concussions in US youth. *Pediatrics* 2016;138(1):e20154635. doi: 10.1542/peds.2015-4635.
2. McRae B, Stay S. Assessment and management of sport-related concussion in general practice. *Aust J Gen Pract* 2024;53(3):121–26. doi: 10.31128/AJGP-12-23-7067.
3. Rausa VC, Borland ML, Kochar A, et al. Pediatric sport and nonsport concussions presenting to emergency departments: Injury circumstances, characteristics, and clinical management. *Neurosurg Focus* 2024;57(1):E4. doi: 10.3171/2024.4.FOCUS2493.
4. Rhodes A, Measey M, Rudkin A. Confusion about concussion: What do parents know? The Royal Children's Hospital National Child Health Poll. *The Royal Children's Hospital*, 2023.
5. Zemek R, Barrowman N, Freedman SB, et al; Pediatric Emergency Research Canada (PERC) Concussion Team. Clinical risk score for persistent postconcussion symptoms among children with acute concussion in the ED. *JAMA* 2016;315(10):1014–25. doi: 10.1001/jama.2016.1203.
6. Davis GA, Patricios J, Schneider KJ, Iverson GL, Silverberg ND. Definition of sport-related concussion: The 6th International Conference on Concussion in Sport. *Br J Sports Med* 2023;57(11):617–18. doi: 10.1136/bjsports-2022-106650.
7. Patricios JS, Schneider KJ, Dvorak J, et al. Consensus statement on concussion in sport: The 6th International Conference on Concussion in Sport—Amsterdam, October 2022. *Br J Sports Med* 2023;57(11):695–711. doi: 10.1136/bjsports-2023-106898.
8. Hearn SJ, Takagi M, Babl FE, et al. Validation of a score to determine time to postconcussive recovery. *Pediatrics* 2017;139(2):e20162003. doi: 10.1542/peds.2016-2003.
9. Iverson GL, Gardner AJ, Terry DP, et al. Predictors of clinical recovery from concussion: A systematic review. *Br J Sports Med* 2017;51(12):941–48. doi: 10.1136/bjsports-2017-097729.
10. Anderson V, Davis GA, Takagi M, et al. Trajectories and predictors of cliniciandetermined recovery after child concussion. *J Neurotrauma* 2020;37(12):1392–400. doi: 10.1089/neu.2019.6683.
11. Thomas E, Chih H, Gabbe B, Fitzgerald M, Cowen G. A cross-sectional study reporting concussion exposure, assessment and management in Western Australian general practice. *BMC Fam Pract* 2021;22(1):46. doi: 10.1186/s12875-021-01384-1.
12. Leddy JJ, Burma JS, Toomey CM, et al. Rest and exercise early after sport-related concussion: A systematic review and meta-analysis. *Br J Sports Med* 2023;57(12):762–70. doi: 10.1136/bjsports-2022-106676.
13. Leddy JJ, Wilber CG, Willer BS. Active recovery from concussion. *Curr Opin Neurol* 2018;31(6):681–86. doi: 10.1097/WCO.0000000000000611.
14. Silverberg ND, Iverson GL. Is rest after concussion "the best medicine?": Recommendations for activity resumption following concussion in athletes, civilians, and military service members. *J Head Trauma Rehabil* 2013;28(4):250–59. doi: 10.1097/HTR.0b013e31825ad658.
15. Petraglia AL, Maroon JC, Bailes JE. From the field of play to the field of combat: A review of the pharmacological management of concussion. *Neurosurgery* 2012;70(6):1520–33. doi: 10.1227/NEU.0b013e31824cebe8.
16. Hoffman NL, Weber ML, Broglio SP, McCreary M, McAllister TW, Schmidt JD; CARE Consortium Investigators. Influence of postconcussion sleep duration on concussion recovery in collegiate athletes. *Clin J Sport Med* 2020;30(Suppl 1):S29–35. doi: 10.1097/JSM.0000000000000538.
17. Putukian M, Purcell L, Schneider KJ, et al. Clinical recovery from concussion—return to school and sport: A systematic review and meta-analysis. *Br J Sports Med* 2023;57(12):798–809. doi: 10.1136/bjsports-2022-106682.
18. Register-Mihalik JK, DeFreese JD, Callahan CE, Carneiro K. Utilizing the biopsychosocial model in concussion treatment: Posttraumatic headache and beyond. *Curr Pain Headache Rep* 2020;24(8):44. doi: 10.1007/s11916-020-00870-y.
19. Broshek DK, Pardini JE, Herring SA. Persisting symptoms after concussion: Time for a paradigm shift. *PM R* 2022;14(12):1509–13. doi: 10.1002/pmrj.12884.
20. Ellis MJ, Leddy JJ, Willer B. Physiological, vestibulo-ocular and cervicogenic post-concussion disorders: An evidence-based classification system with directions for treatment. *Brain Inj* 2015;29(2):238–48. doi: 10.3109/02699052.2014.965207.
21. Schneider KJ, Meeuwisse WH, Nettel-Aguirre A, Boyd L, Barlow KM, Emery CA. Cervicovestibular physiotherapy in the treatment of individuals with persistent symptoms following sportrelated concussion: A randomized controlled trial. *Br J Sports Med* 2013;47(5):e1.50–e1. doi: 10.1136/bjsports-2012-092101.54.
22. Iverson GL, Greenberg J, Cook NE. Anxiety is associated with diverse physical and cognitive symptoms in youth presenting to a multidisciplinary concussion clinic. *Front Neurol* 2022;12:811462. doi: 10.3389/fneur.2021.811462.

23. DiFazio M, Silverberg ND, Kirkwood MW, Bernier R, Iverson GL. Prolonged activity restriction after concussion: Are we worsening outcomes? *Clin Pediatr (Phila)* 2016;55(5):443–51. doi: 10.1177/0009922815589914.
24. Nicholson RA, Houle TT, Rhudy JL, Norton PJ. Psychological risk factors in headache. *Headache* 2007;47(3):413–26. doi: 10.1111/j.1526-4610.2006.00716.x.
25. Catarozoli C, Butler E, Parikh K, Kosofsky B. Cognitivebehavioral therapy for persistent postconcussive symptoms in youth: Adaptations, treatment recommendations, and implementation in medical settings. *Cogn Behav Pract* 2024;31(3):399–412. doi:10.1016/j.cbpra.2023.12.004.
26. Faulkner J, Prouty D, Devlin L, et al. Acceptance and commitment therapy for mild traumatic brain injury (ACTion-mTBI): A quasiexperimental feasibility study. *BMJ Open* 2025;15(2):e089727. doi: 10.1136/bmjopen-2024-089727.
27. Echemendia RJ, Ahmed OH, Bailey CM, et al. Patricios J. Introducing the Concussion Recognition Tool 6 (CRT6). *Br J Sports Med* 2023;57(11):689–91. doi: 10.1136/bjsports-2023-106851.
28. Clarke C, Anderson V, Babl FE, et al; Take CARE and Curve Tomorrow teams. Child concussion recognition and recovery: A community delivered, evidenced-based solution. *Ann Transl Med* 2020;8(9):595. doi: 10.21037/atm.2020.03.50.
29. Davis GA, Echemendia RJ, Ahmed OH, et al. Introducing the Child Sport Concussion Assessment Tool 6 (Child SCAT6). *Br J Sports Med* 2023;57(11):632–35. doi: 10.1136/bjsports-2023-106853.
30. Echemendia RJ, Brett BL, Broglio S, et al. Bruce JM. Introducing the Sport Concussion Assessment Tool 6 (SCAT6). *Br J Sports Med* 2023;57(11):619–21. doi: 10.1136/bjsports-2023-106849.
31. Davis GA, Patricios JS, Purcell LK, et al. Introducing The Child Sport Concussion Office Assessment Tool 6 (Child SCOAT6). *Br J Sports Med* 2023;57(11):668–71. doi: 10.1136/bjsports-2023-106858.
32. Davis GA, Rausa VC, Babl FE, et al. Improving subacute management of post concussion symptoms: A pilot study of the Melbourne Paediatric Concussion Scale parent report. *Concussion* 2020;7(1):CNC97. doi: 10.2217/cnc-2021-0007.
33. Babl FE, Tavender E, Dalziel S; Guideline Working Group for the Paediatric Research in Emergency Departments International Collaborative (PREDICT). Australian and New Zealand guideline for mild to moderate head injuries in children – Full guideline. PREDICT, 2021.
34. Kuppermann N, Holmes JF, Dayan PS, et al; Pediatric Emergency Care Applied Research Network (PECARN). Identification of children at very low risk of clinically-important brain injuries after head trauma: A prospective cohort study. *Lancet* 2009;374(9696):1160–70. doi: 10.1016/S0140-6736(09)61558-0.

correspondence ajgp@racgp.org.au