Challenges and Opportunities of General Practitioners and Physiotherapists Managing Return to Play Following Concussion: A Qualitative Study

Colin Hancock *MPhil*
AUT Traumatic Brain Injury Network, Faculty of Health and Environmental Sciences, Auckland University of Technology, Auckland, New Zealand

Jason Chua *PhD*
AUT Traumatic Brain Injury Network, Faculty of Health and Environmental Sciences, Auckland University of Technology, Auckland, New Zealand

Alice Theadom *PhD*
AUT Traumatic Brain Injury Network, Faculty of Health and Environmental Sciences, Auckland University of Technology, Auckland, New Zealand

Duncan Reid *DHSc*
AUT Traumatic Brain Injury Network; Sport Performance Research Institute New Zealand; Active Living and Rehabilitation Aotearoa (ALARA), Faculty of Health and Environmental Sciences, Auckland University of Technology, Auckland, New Zealand

ABSTRACT

Practice guidelines recommend that following a concussion, individuals wishing to return to recreational activities should follow a structured return to play process that includes a recovery assessment and medical clearance. General practitioners and physiotherapists have complementary skills in delivering return to play support, which can enhance interdisciplinary care (e.g., assessment of recovery and medical clearance). However, there is limited information about their experiences in delivering this support or working collaboratively. This study explored the experiences of GPs and physiotherapists in managing return to play and their views about working together. Semi-structured online interviews were conducted with four GPs and five physiotherapists and analysed using thematic analysis. Three themes were generated describing these two groups of health practitioners' experiences: (1) What return to play means to me; (2) What influences how well I can help someone with return to play; (3) Communities and connections. Participants described challenges within primary care that affected their ability to assess recovery and manage the return to play process. Both GPs and physiotherapists expressed positive views about working together on concussion-related care, including diagnosis, referral to multi-disciplinary teams, and making safe return to play decisions. The findings highlight a need for improved understanding of how to assess recovery and develop mechanisms, such as clinical time or technologies within primary care to support better communication and collaboration during return to play.

Hancock, C., Chua, J., Theadom, A., & Reid, D. (2026). Challenges and opportunities of general practitioners and physiotherapists managing return to play following concussion: A qualitative study. *New Zealand Journal of Physiotherapy, 54*(1), 36–49. https://doi.org.10.15619/nzjp.v54i1.496

Key words: Concussion, Interdisciplinary Care, Primary Care, Return to Play, Sports Injuries

INTRODUCTION

Concussion, or mild traumatic brain injury, is a temporary dysfunction of the brain caused by a direct or transmitted blow to the head (Patricios et al., 2023). In New Zealand, concussion accounts for 95% of all traumatic brain injuries (Feigin et al., 2013), which are commonly caused by falls, recreational activities, assaults, and motor vehicle accidents (Accident Compensation Corporation, 2023). Sports-related concussion makes up approximately 25% of all concussions (Accident Compensation Corporation, 2025). Individuals returning to activities at higher risk of reinjury, such as contact sports, must be adequately recovered before resuming these activities.

Concussions involve a rapid onset of neurological impairments, which often resolve spontaneously within 14 days (Putukian et al., 2023). However, many people take weeks or months to recover (Kara et al., 2020). This variability necessitates healthcare professionals (HCPs) to perform multiple reviews to assess recovery and inform return to play (RTP) decisions. Concerns are growing over whether current clinical reviews adequately capture recovery and RTP readiness (Choudhury et al., 2020; Churchill et al., 2021; Hallock et al., 2023; Hou et al., 2023; Petrie et al., 2024). The long-term neurological effects of concussion and repeated concussions are also a concern (Hallock et al., 2023; Hind et al., 2022; Hou et al., 2023; Lambert et al., 2022; Manley et al., 2017). Clear assessment protocols for RTP decision making are needed to protect brain health.

In 2023, the Concussion in Sport Guidelines Group expanded its guidance regarding the responsibility for

concussion diagnosis and RTP clearance from medical practitioners to a broader definition of HCPs, including physiotherapists (Patricios et al., 2023). In response, New Zealand's government-owned no-fault accident insurer, the Accident Compensation Corporation (ACC), produced its own guidelines that still require a medical diagnosis. A medical diagnosis of concussion is required for subsequent access to ACC-funded multi-disciplinary team secondary care concussion services if needed for persistent concussion symptoms and also leads to the need for a medical clearance for RTP (Accident Compensation Corporation, 2026). Despite an updated ACC guide being released (Accident Compensation Corporation, 2026), which expanded guidance from medical-only to HCPs experienced in concussion care, ACC's official policies continue to maintain medical-only diagnosis and referral to a multi-disciplinary team within primary care (R. Lobb, Concussion Lead, Habit Health Ltd, personal communication, October 6, 2025). However, the ACC guideline strongly advocates, but does not mandate, for a HCP clearance for RTP. Major national sporting organisations in New Zealand still mandate a medical diagnosis and clearance requirement within their concussion guidelines (Equestrian Sports New Zealand, 2020; New Zealand Football, 2024; New Zealand Rugby, 2025; New Zealand Rugby League, 2025).

The requirement for medical-only diagnoses, onward referral, and clearance coincides with pressures on the New Zealand primary care system due to medical workforce shortages, particularly in rural areas (Andrew, 2024; Ministry of Health, 2024). GPs report limited time and confidence in managing concussions, particularly RTP decisions (Salmon, Sullivan et al., 2020; Stuart et al., 2022). In contrast, non-medical HCPs, including physiotherapists, frequently manage concussion from recognition, recovery management, and RTP (Maxtone et al., 2020; Reid et al., 2020). Limited access to GPs has led to challenges for physiotherapists, including obtaining official diagnoses, inefficient multi-disciplinary team concussion services referrals (when required), and timely RTP clearance (Dalton et al., 2024). It has also led to erroneous coding of concussion injuries as other injuries due to the ACC's medical-legal policy, which renders physiotherapists unable to provide a medical diagnosis for concussion and subsequent access to ACC-funded care (Poloai et al., 2023).

Most concussion and RTP management occurs at the primary care level, with a small minority (10%) requiring multi-disciplinary team referral for persistent concussion symptoms (Bastos Gottgtroy et al, 2022). A pilot study providing a more supportive primary care concussion pathway within one district in New Zealand, discovered that around 28% of individuals required multi-disciplinary team care due to persistent concussion symptoms (Theadom et al., 2024), implying that a less supportive pathway is associated with a proportion of individuals receiving inadequate follow-up care. Previous studies have explored the experiences of GPs and physiotherapists managing concussion (Dalton et al., 2024; Salmon et al., 2022; Salmon et al., 2023). However, there is a knowledge gap regarding GPs' and physiotherapists' experiences delivering RTP. Greater understanding about how GPs and physiotherapists manage RTP could help inform strategies to support clinicians' delivery of RTP. This study aimed to explore these two groups of HCPs' experiences delivering RTP care and identify opportunities to improve patient recovery.

METHODS

Study design

A cross-sectional qualitative study was undertaken adopting a constructivist philosophical perspective to explore participants' lived experiences to gain insight into the contextual experiences of GPs and physiotherapists delivering RTP care (Lincoln et al., 2011). Ethical approval was granted by the Auckland University of Technology Ethics Committee (reference number 22/87).

Setting and participant recruitment

A convenience sample of primary care GPs and physiotherapists was recruited. To be eligible to participate in the study, GPs and physiotherapists needed to be registered with at least two years' clinical experience managing RTP for concussion in New Zealand. The recruitment period took place between 18 October 2022 and 23 February 2023.

Recruitment involved sharing an advertisement via email with relevant professional organisations and special interest groups (including several rural community-based organisations with a focus on Māori health promotion across New Zealand), on social media (e.g., Facebook, Twitter), and the Auckland University of Technology Traumatic Brain Injury Network. Interested individuals contacted the first author (CH) for eligibility screening and informed consent. No prior relationship existed between the participants and the interviewer.

Data collection

Online one-to-one interviews were conducted to explore participants' experiences of managing concussion and RTP in primary care. A semi-structured interview schedule (Table 1) was developed by the research team. Interviews with open-ended questions were used to gain insight into participants' experiences because it allows them to follow their thought process (Adams, 2010). Prior to data collection, the interview schedule was piloted on two HCPs who were not participants.

Interviews were performed by a male researcher (CH), a trained physiotherapist with qualitative interviewing training, via Zoom teleconferencing (© 2023 Zoom Communications, Inc.) to allow equal participation across New Zealand and mitigate against COVID-19 at the time of the study. No field notes were taken, and participants were not asked to review transcripts nor repeat interviews. Efforts to recruit participants and perform interviews continued until it became apparent that no new concepts were being described by subsequent participants. Interviews were transcribed using Otter.ai transcription software (Otter.ai., October 2022, https://otter.ai), checked for accuracy, and anonymised by a researcher (CH).

Data analysis

The interview data were analysed using Braun and Clarke's (2006) thematic analysis approach. After reading the

Table 1

Semi-structured Interview Question Guide

Lead questions and probing questions
What does managing RTP mean to you?
Are you aware of any guidelines for managing RTP?
Can you name the guidelines you refer to?
What barriers do you encounter when delivering RTP care?
What enablers do you encounter when delivering RTP care?
Is there anything that would support you to deliver better RTP care to your patients?
Are there any special considerations, specifically for rural areas, that would support better RTP care?
How confident are you in deciding whether or not a patient is safe to return to play or contact sport (or providing medical clearance, if a GP)?
Why do you feel this way?
What do you consider when deciding if a player is ready to return to play or contact sport?
Do you use any *objective* assessments/tests? If yes, what objective measures do you use?
Do you consider any *subjective* information, and if yes, what?
Are there any other important considerations that you consider?
What would make it easier for you to decide if a player is ready to RTP or provide medical clearance?
What are your thoughts about working with GPs/physiotherapists?
What do you see as their role in RTP care?
What would make it easier for you to work in a multidisciplinary team with a GP/physiotherapist?
Do you feel confident delivering culturally responsive RTP care?
Why?
What type of support would enable you to do this better?
Is there anything else you would like to say?

Note. RTP = return to play.

transcripts in-depth to familiarise with the content, segments of text were labelled with codes in NVivo (QSR International, Burlington, MA) using an inductive approach. Similar codes were then grouped into subthemes representing a concept. Subthemes were grouped into higher order themes until a thematic framework was generated. Two researchers (CH and JC) independently coded the transcripts and developed a preliminary thematic framework. A discussion was held with a third researcher (AT) where the initial thematic frameworks were compared and integrated to develop one overarching thematic framework. A final verification step was conducted by a fourth researcher (DR) to establish face validity of the final thematic framework.

RESULTS

Eleven people responded to the study invitation. One respondent had less than two years' experience managing concussion in primary care and another was lost to follow-up, leaving nine study participants. Five physiotherapists and four GPs were interviewed, with interviews lasting 50–75 min. Recruitment ceased after nine interviews because no new concepts presented in the final two interviews, suggesting sufficient information power had been achieved (Malterud et al., 2016). Participant demographics are presented in Table 2. The sample was distributed across both rural (55%) and urban (44%) areas. Participants were aged from 31 to 72 years (*M* (*SD*) 44.4 (15.2) years). All participants worked in primary care and reported treating an average of 18.2 concussions per year (*SD* 15.9, *Mdn* 11, range 3–52). Just over a half of the participants (56%) had 11 years or more clinical experience managing concussion.

The analysis produced three overarching themes: (1) What RTP means to me, (2) What influences how well I can help someone with RTP, and (3) Communities and connection. Each theme is supported by sub-themes outlined in Figure 1, which demonstrates a degree of interrelationship between themes. Supporting quotes for the themes are provided in Appendix A. Overall, both professions recognised RTP management as important. Although GPs and physiotherapists shared common views on successes and challenges, notable differences in focus were identified and detailed below.

Theme 1: What RTP means to me

This theme describes how participants perform RTP management.

1.1. Assessing recovery

The participants described RTP as a process that involves assessing different aspects of recovery (symptom resolution, changes to mood, response to stress, function at work/school/overall function), culminating in medical clearance. GPs were aware of their oversight role in discerning

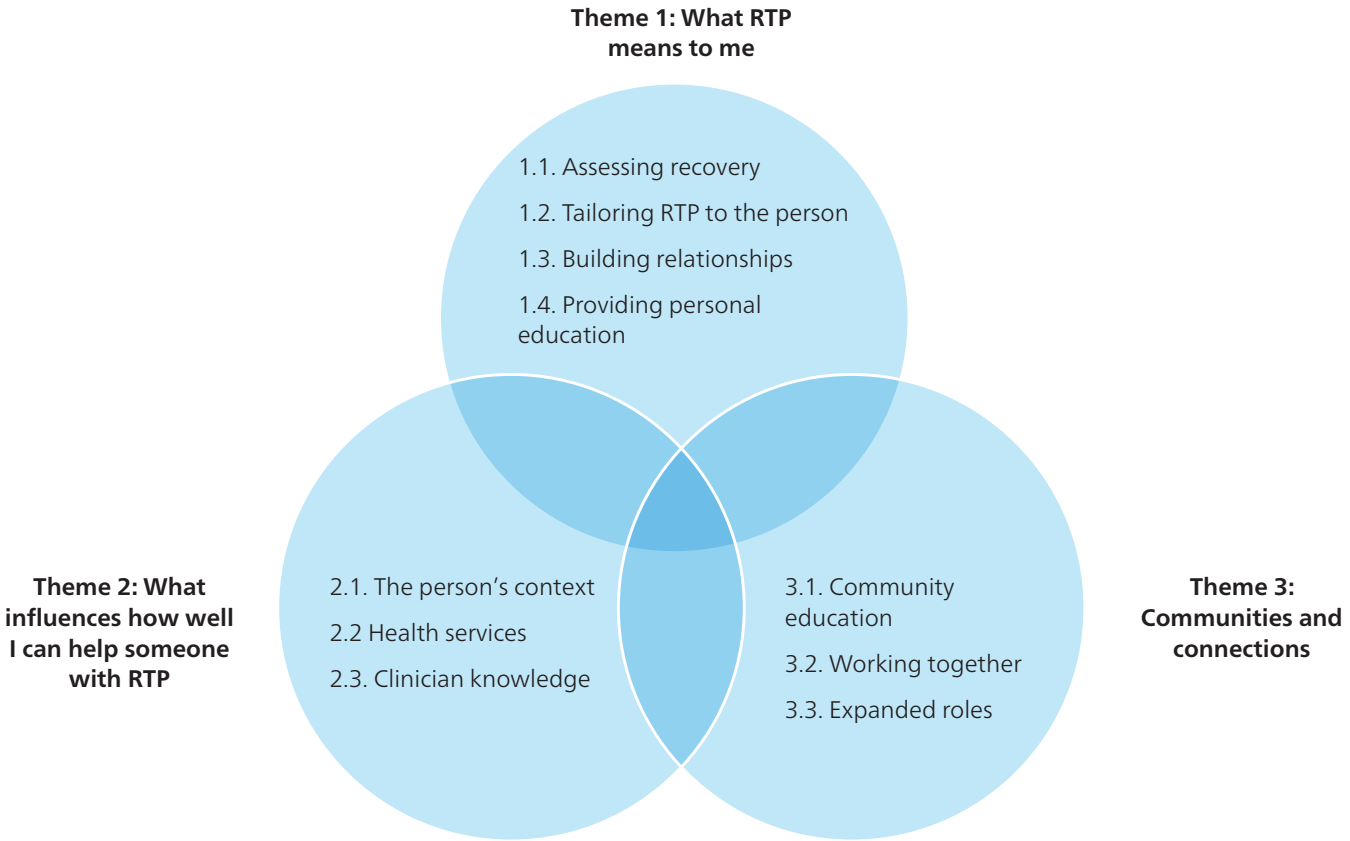
Table 2

Demographic Characteristics of the Study Participants (N = *9)*

Characteristic	*n*	%
Gender		
Male	6	67
Female	3	33
Ethnicity		
New Zealand European	8	89
Other	1	11
Clinical discipline		
General practitioner	4	44
Physiotherapist	5	56
Education		
Bachelors	3	30
Postgraduate certificate	1	10
Postgraduate diploma	3	30
Masters	2	20
Remoteness		
Rural	5	56
Urban	4	44
Professional experience (years)		
> 11	5	56
5–10	3	33
< 5	1	11

Figure 1

Themes Derived from the Qualitative Analysis



Note. RTP = return to play.

recovery for RTP (quotes (Q)2–16) and described their role in managing concussion by considering the impact on the person's function, such as work or school life. For example, GP1 noted: "It's like the standard answer in the health system … GPs will do it. … the guidelines … says you need to get a medical clearance before you go back."

Physiotherapists described RTP more as a series of steps that involved a gradual reintroduction of physical stress, often using validated objective tests, which culminated in a symptom-free return to full sports participation (Q1–2): "To me, it means observing them as they return to play through the various stages making sure that you have observed every stage they get to and ask them questions the next day" (PT3).

1.2. Tailoring RTP to the person

Participants emphasised that effective management must be based on the individual's recovery expectations, priorities, and motivation (Q1–3, 1–4). They suggested that cultural responsiveness is required when assisting people through RTP (Q1–5), yet the tools they used to assess recovery were not culturally inclusive (e.g., using words like "feeling more emotional") (Q1–6).

> …but the way that Māori and Pacific Islanders view an injury is very different … for instance … "I don't feel right" and "feel more emotional", "more irritable" … these people are answering differently, and I don't think that necessarily reflects their cultural background. (PT3)

1.3. Building relationships

Participants reported that creating a trusting relationship between the person, their support network/whānau, and the HCPs was deemed critical to RTP and facilitated accurate symptom reporting (Q1–7, 1–8). This was especially important in rural areas where individuals had limited healthcare options (Q1–9, 1–10).

> …it has to be [a] relationship that the rest of your whānau trust as well. So, if you are going to see a GP that you feel mismanaged your auntie, you are not going to trust that GP; [it] gets complicated in rural areas where there aren't many options. (GP2)

1.4. Providing personal education

Participants described providing education about concussion as a necessity for the RTP to work well (Q1–11, 1–12). Providing education about concussion enabled improved engagement with accurate symptom reporting, avoided loss to follow-up, and prevented premature RTP (Q1–11, 1–12).

> …I think the education part is key … they can lie to you and be like, "I've got no symptoms, it's fine, I can go back", but I think if you explain it to people properly then they can … take seriously what's actually going on with them. (GP3)

Theme 2: What influences how well I can help someone with RTP

This theme describes what participants suggest affects the ability to perform RTP management well.

2.1. The person's context

An individual's health literacy influences their initial healthcare-seeking behaviour and subsequent engagement with RTP management. The participants noted that external pressures including team pressure, cultural shame, or whakamā (shame) experienced by Māori or Pacific individuals could lead to misreporting of symptoms to expedite their return to play (Q2–1, 2–2, 2–3, 2–4).

> …there are varying degrees of health literacy among the people that I'll treat. … they are experiencing symptoms that they don't know that's a thing that they need to report, or they sort of don't necessarily understand the risks and ramifications in returning too early. (PT2)

Another contextual issue described by participants from rural areas was how a person's geographical remoteness or transient work made it difficult for them to attend follow-up appointments, such as specialist care (Q2–5). Participants described how people faced financial barriers to accessing care, such as costs for appointments and travel, alongside lost income due to time off work. While telehealth was useful for overcoming geographical barriers, its utility was limited by the cost to the person (technology and consult costs) and to those with an inadequate internet connection (Q2–6, 2–7).

2.2 Health services

Participants cited limited GP clinical time for assessments and follow-up within the current service delivery as a hindrance to timely, supported RTP (Q2–8, 2–9, 2–10). GP1 noted that "…if they don't pass, you then can't book them in for repeat in a week or two weeks. It's a repeat in four weeks." This was reiterated by PT3: "I think they're [GPs] just very constrained, I think they just don't have the time … they just don't also know what to do with it … patients get lost in the system."

The participants noted that RTP outcomes were influenced by their initial healthcare encounters (Q2–11), citing the absence of care pathways as a hindrance to monitoring a person's recovery progression, with individuals receiving an inconsistent service (Q2–12, 2–13, 2–14, 2–15). For example, PT5 reported, "…often I'm not catching these people acutely … probably it's coming really clear [from] this conversation is the timeframe and how delayed my input really is."

2.3. Clinician knowledge

The participants expressed a desire for additional knowledge about RTP care. One GP reported that the term RTP was confusing as it meant different things depending on the context they were in (Q2–16).

> It depends a little bit on whether I'm seeing them at a sports field or at a ski field, or in an emergency department, or whether I'm seeing them as a GP. … somebody comes to you for the clearance … so you might have to make a clinical decision around whether they have recovered enough or not. (GP4)

Participants noted they found guidance on performing medical clearances confusing, as described by GP1: "…a medical clearance before you go back … it's really vague about what it entails? I think it's intentionally vague, to make it workable. But then why have it?". They reported mandatory stand-down periods were arbitrary rather than informed by an individual's state of recovery (Q2–17, 2–18, 2–19): "… 21

days off before you can do anything I think is too arbitrary" (GP3).

Physiotherapists reported situations where individuals obtained medical clearances, despite their observations that they had not recovered enough to RTP (Q2–22, 2–23). Medical clearance was also described by both physiotherapists and GPs as being akin to a "rubber stamping" exercise rather than a well-informed critical step in the graduated RTP process (Q3–9). GPs acknowledged they often did not work closely with the person to determine their readiness for medically clearance to RTP.

> … I've been sent a couple of patients I've had nothing to do with except for the fact that they need this GP medical clearance. … you would want that to be a GP who's actually adding value, rather than just a rubber stamp. (GP2)

GPs in rural areas described a haphazard responsiveness to referrals for concussion services: "…sent a referral through and they ended up … doing phone calls with her…" (GP1).

Participants from rural areas stated that an added barrier they had was poor access to colleagues with experience in RTP care, which made upskilling challenging. In addition, time-poor GPs reported being "bombarded" with extensive opportunities for continued training in other areas (Q2–22, 2–23).

> … it needs to be better training. How that would happen, from a timing point of view is impossible. You know, we're being sent training modules for everything under the sun … and there's only so many … training modules you can do. (GP2)

Theme 3: Communities and connections

This theme highlighted opportunities for system-level improvement through broader community engagement and professional collaboration.

3.1. Community education

Increasing awareness about concussion recovery and managed RTP in community settings was seen to encourage early help-seeking (Q3–1). Some participants believed that a person's RTP could be supported by a community-based navigator for HCPs to liaise with, who advocates for the person's recovery within schools, work, or sports organisations (Q3–2, 3–3). Participants suggested funding local HCPs to conduct community-based education to improve understanding and foster trust in HCPs. However, participants also noted HCPs' time constraints (Q3–4, 3–5): "I'd get ACC, to actually fund education for the coaches … use physio[therapist]s to do it." (GP4).

3.2. Working together

Some participants stated that "two heads are better than one" with decisions about RTP and medical clearance (Q3–6, 3–7). One GP felt more confident diagnosing the concussion and providing medical clearance with support from a physiotherapist (Q3–8).

> …a physio[therapist] that I knew, who sent me an email and said, "Hey, I'm sending in X person to come and have a [medical], they need their sign off." … I would have a lot more confidence that that person was getting better care. (GP3)

Conversely, without physiotherapy support, GPs expressed more uncertainty about providing medical clearance (Q3–9).

> Some physio[therapist]s send us letters around it … I've been sent a couple of patients I've had nothing to do with except for the fact that they need this GP medical clearance. Then everything has been done through this team physio[therapist]. And it's really helpful. (GP 4)

Poor communication between the two professions was a common barrier (Q2–14): "My experience is it doesn't currently work well … [We] don't have open lines of communication. So that needs to be ensured" (PT5).

3.3. Expanded roles

Participants agreed that the ability to work together enabled better care of the person with concussion. One suggestion from multiple participants was to expand the scope of physiotherapy practice to include concussion diagnosis and RTP clearance (Q3–10, 3–11): "…we probably just need to be a little bit less high and mighty about saying that doctors are the only ones to do it … I think that should be changed … I think that'd be more helpful" (GP3).

This change was perceived to be valuable, particularly for rural communities where access to a skilled concussion workforce was limited and when physiotherapists were already managing the person to full recovery (Q3–12, 3–13).

> I think at the end of the day to make a call on someone going back … I think the physiotherapist is still in the best position to make that decision. But I don't believe that legally, we're in a position to be able to make a decision without a doctor. (PT1)

DISCUSSION

GPs have previously reported low confidence in managing concussion and RTP (Stuart et al., 2022), while physiotherapists report greater confidence in managing concussion and want increased involvement in supporting GPs with both concussion and RTP management (Reid et al., 2020). This study expands on this evidence by providing a deeper understanding of the experiences of those managing concussion and RTP, as well as what GPs and physiotherapists believe about collaborating on RTP management.

GPs and physiotherapists in this study had an overall understanding of post-concussion RTP principles as outlined in the Concussion in Sport Guidelines Group and ACC guidelines (Accident Compensation Corporation, 2026; Patricios et al., 2023). They described recovery assessment as reliant on a person's disclosure of signs and symptoms, which guided progression to school or work activities as a prerequisite and alongside the RTP process. GPs did not describe communicating with other HCPs, other than physiotherapists, to inform their RTP decisions. The RTP process was described as commencing with low-risk physical activity and gradually increasing exertion in a controlled environment to minimise re-injury risk. In keeping with

current guidelines, both GPs and physiotherapists emphasised the importance of symptom stability before progressing to higher exercise intensities, resulting in full, unrestricted RTP.

There was less agreement on assessing recovery, with some variation between participants and within professions. GPs often based decisions on a brief review of the person's reported symptoms, whereas physiotherapists preferred objectively testing physical activity tolerance, such as using the Buffalo Concussion Treadmill Test (Kumar et al., 2024) to assess for physiological recovery, rather than only relying on the person to self-report symptoms; this was particularly important when people might under-report to RTP, such as before an important match.

Both GPs and physiotherapists recognised the importance of assessing cognitive and emotional impacts of concussion alongside the physical symptoms of concussion. While physiotherapists typically deferred to GPs for managing these aspects, GPs reported limited time and knowledge to assess them. One GP used the brief memory screening test from the Sports Concussion Assessment Tool (SCAT) to evaluate cognitive recovery, which may lead to inaccurate RTP decisions (Echemendia et al., 2023). Many people still experience ongoing cognitive and emotional symptoms 1–6 months after injury and often despite a clearance for RTP (Hind et al., 2022; Hou et al., 2023; Lambert et al., 2022; Manley et al., 2017), and clear guidance is lacking (Hallock et al., 2023). These inconsistencies in recovery assessment may reflect undesirable variations in care.

Updated ACC guidelines now recommend that HCPs experienced in concussion management can provide clearance for RTP (Accident Compensation Corporation, 2026). This change has the potential to address the limited access to, and clinical time needed for, medical clearance for RTP reported here and elsewhere (Salmon, Sullivan, et al., 2020; Stuart et al., 2022). However, at the time of publication, ACC had yet to translate their guidelines into practice, maintaining a policy of medical-only diagnoses of concussion for insurance purposes, alongside medical-only referrals for access to secondary care concussion services (R. Lobb, Concussion Lead, Habit Health Ltd, October 6, 2025). Furthermore, sporting organisations still maintain that medical clearance is required for RTP (Equestrian Sports New Zealand, 2020; New Zealand Football, 2024; New Zealand Rugby, 2025; New Zealand Rugby League, 2025). Within this study, both GPs and physiotherapists identified ongoing logistical challenges with needing a medical-only clearance for RTP; GPs experienced time constraints to adequately assess readiness and physiotherapists struggled with delayed RTP clearance reviews due to limited GP access, aligning with previous research (Dalton et al., 2024; Salmon, Sullivan, et al., 2020; Stuart et al., 2022). The GPs and physiotherapists were supportive of a change to health system policy allowing the expanded scope of physiotherapists to work alongside GPs to provide concussion diagnosis, onward referral to a multi-disciplinary team, and clearance assessments. These changes highlight the importance of up-to-date and accessible RTP training for primary care HCPs and the need to align health policy and clinical guidance.

GPs viewed medical clearance more as a "box-ticking" exercise than a comprehensive assessment. GPs relied on patients' honest self-reporting of symptoms and confirmation that low-risk symptom-free physical activity had occurred prior to the clearance review. Both GPs and physiotherapists agreed that involvement in monitoring and supporting people through the stages of the RTP process would increase confidence in determining readiness for RTP, aligning with findings by Dalton et al. (2024). GPs also found physiotherapists' support and recommendations helpful in their decision-making, not only in making a diagnosis but also in determining medical clearance. GPs described less confidence when a physiotherapist was not involved. Given GPs continue to have the oversight role in diagnosis, onward referral to concussion services, and RTP clearance, early referral to a local physiotherapist with knowledge in concussion management is recommended to support timely access to care and RTP management.

Accurate judgement of recovery is critical due to the increased risk of re-injury during the post-clearance RTP steps (Patricios et al., 2023). Researchers have raised concerns about whether current RTP clearance practices adequately assess holistic recovery, with an over-emphasis on physical recovery at the expense of cognitive and emotional domains of recovery, despite evidence suggesting these domains take longer to resolve (Choudhury et al., 2020; Churchill et al., 2021; Petrie et al., 2024), alongside a reliance on symptom-disclosure to inform discernment of recovery. Therefore, there is an inherent risk of premature clearance for RTP. Neither the Concussion in Sport Guidelines Group (Patricios et al., 2023) nor ACC (Accident Compensation Corporation, 2026) guidelines provide clear recommendations about whether HCPs should follow-up on individuals after clearance to monitor for ongoing symptom stability during the post-clearance RTP steps, confirming the accuracy of the clearance decision. This may explain why participants held differing views on HCP oversight during post-clearance RTP steps: GPs described no follow-up post-clearance review, while physiotherapists preferred reviewing patients after each step to ensure symptom stability remained until full symptom-free RTP is achieved. Clarification on how much post-clearance oversight is required during the riskier RTP steps is a point to consider for future guideline updates.

Confidence in managing concussion and RTP in primary care is essential, as 90% of concussion injuries are treated at this level (Bastos Gottgtroy et al., 2022; Theadom et al., 2024). Participants described wanting to learn more about RTP but faced time constraints, echoing prior evidence (Dalton et al., 2024; Derbyshire et al., 2021; Salmon et al., 2023). As a result, they relied on guidelines to refresh their knowledge. Most GPs see few concussions annually (Salmon, Sullivan, et al., 2020; Stuart et al., 2022), and this is likely to be similar for physiotherapists outside sports or concussion clinics. This may explain why ACC's updated concussion guideline now defines appropriate HCPs to manage concussion as "a health practitioner experienced in concussion management" (Accident Compensation Corporation, 2026).

RTP management was influenced by a person's perceptions, health literacy, motivation, and sociocultural background in the current study. Participants reported that many people with concussion do not disclose their injury to a HCP, instead they self–manage their injury and RTP without oversight. ACC estimates around 30% of concussions go unreported (Accident Compensation Corporation, 2026). Participants frequently worked with individuals with low health literacy about concussion, which shaped their perception of the value of a managed RTP. Participants emphasised involving whānau to detect emotional or cognitive issues and recommended adapting tools like the SCAT to better reflect Māori concepts, such as whakamā. Fear of missing sports and social isolation often led to under-reporting and disengagement, consistent with previous research (McLeod et al., 2024; Petrie et al., 2024). Previous studies show variable levels of concussion knowledge and attitudes among New Zealand-based athletes, indicating some sports organisations communicate concussion messages better than others (O'Reilly et al., 2020; Salmon, McGowan et al., 2020; Theadom et al., 2020). Other factors such as socioeconomic background, sports organisational support, and health system issues also contribute to underreporting (Bastos Gottgtroy et al., 2022; Graves et al., 2019; Pappadis et al., 2024; Petrie et al., 2024; Weishaar et al., 2024). These factors require HCPs to tailor RTP approaches and foster trust with the person and their whānau, who play a critical role in symptom disclosure.

Several participants described the usefulness of communication directly with community stakeholders regarding an individual's recovery and RTP. Physiotherapists associated optimal recovery with regular liaison between stakeholders such as whānau, GPs, schools, workplaces, coaches, and ACC, alongside greater public awareness about concussion care. However, participants noted that this communication required time and resources, which are not recognised or valued in ACC's current primary care funding, aligning with findings from studies of GPs (Salmon et al., 2022) and physiotherapists (Salmon et al., 2023). One participant suggested formal health liaison roles in schools and sports organisations to ensure better communication between HCPs and community stakeholders. A framework for supporting those with concussion and stakeholders involving New Zealand schools has shown promise for addressing this unmet need (Badenhorst et al., 2025).

Participants described how limited access to clinicians, short consultation time, and the costs of follow-up appointments often led patients, particularly in rural areas, to disengage with care, echoing findings by Graves et al. (2019). The quality of initial HCP interaction was essential to ongoing engagement, with poor experiences reducing the likelihood of follow-up. Telehealth was viewed as a cost-effective alternative for rural patients, though less ideal than in-person care. The use of telehealth has brought a new set of logistical challenges and quality care issues to HCPs (Osman et al., 2024) and remains an under-researched area in the New Zealand context for concussion and RTP.

GPs and physiotherapists reported times of strong collaboration, with GP-led diagnosis and clearance, while physiotherapists supported recovery and RTP. However, issues included delayed diagnoses, conflicting decisions, and inefficiencies in a strained system. While prior research shows physiotherapists are open to working more closely with GPs (Dalton et al., 2024; Maxtone et al., 2020; Reid et al., 2020; Salmon et al., 2023), this study found both professions wanted clearer roles in testing recovery for RTP and referring for multi-disciplinary team care, especially in rural settings with limited HCPs.

Our study found that communication between GPs and physiotherapists for RTP care was essential, yet role expectations were unclear and communication often one-way. Trust between HCPs was described as taking time to develop, which was especially difficult for locum practitioners. Health service designers should consider augmenting systems that strengthen interdisciplinary collaboration to enhance RTP care such as the integrated care pathways (Accident Compensation Corporation, 2024).

A limitation of the study is the modest sample size; however, the experienced participants produced a rich dataset and we observed data redundancy after nine interviews, suggesting sufficient information power had been achieved (Malterud et al., 2016). Despite our efforts to recruit from Kaupapa Māori services, we were unable to recruit participants from this context. Advertising the study via Tae Ora Tinana may have supported better recruitment. Our sample of physiotherapists also does not reflect the range of settings in which they deliver care (e.g., concussion services) (Maxtone et al., 2020), although our sample had a high proportion of participants from rural areas. The transferability of our findings could be strengthened by a more representative sample of Māori and Pacifica HCPs and varied care settings, which could have yielded more diverse experiences.

CONCLUSION

GPs and physiotherapists found it challenging to assess recovery following a concussion. There is a need for improved understanding of how to assess recovery and the development of mechanisms within primary care to support better communication and collaboration during the RTP process.

KEY POINTS

1. GPs and physiotherapists are open to sharing the responsibilities for concussion management, including diagnosis, referral to multi-disciplinary team care, and discerning recovery for clearance to RTP.
2. GPs and physiotherapists would like support improving knowledge and confidence in how to assess holistic recovery for RTP after concussion.
3. Supporting better communication between GPs and physiotherapists with the time and resources to do so could promote better interdisciplinary RTP decision-making.

DISCLOSURES

This research did not receive any specific funding. No conflicts

of interest exist that may be perceived to interfere with or bias this study.

PERMISSIONS

Ethical approval for the study was granted by the Auckland University of Technology (AUT) Ethics Committee (reference number 22/87). Informed consent was gained from all participants.

ACKNOWLEDGEMENTS

We thank all participants who volunteered to be interviewed for this study.

AUTHOR CONTRIBUTIONS

Design conceptualisation, CH, JC, AT, and DR; methodology, CH, JC, AT, and DR; formal analysis, CH, JC, and AT; investigation, CH; writing – original draft, CH; writing – review, CH, JC, AT, and DR; supervision, JC, AT, and DR; project administration, CH, JC, AT, and DR.

ADDRESS FOR CORRESPONDENCE

Colin Hancock, Faculty of Health and Environmental Sciences, Auckland University of Technology, Auckland, New Zealand.

Email: cn.hancock.ch@gmail.com

REFERENCES

Accident Compensation Corporation. (2023, September 19). *Reducing traumatic brain injuries (TBI).* https://www.acc.co.nz/preventing-injury/traumatic-brain-injury-tbi

Accident Compensation Corporation. (2024, June 4). *Integrated care pathways musculoskeletal*. https://www.acc.co.nz/for-providers/provider-contracts-and-services/integrated-care-pathways/integrated-care-pathways-musculoskeletal

Accident Compensation Corporation. (2025, July 31). *ACC concussion/TBI data 2024 update*. https://catalogue.data.govt.nz/dataset/acc-concussion-tbi-data-update

Accident Compensation Corporation. (2026, January). *Sport concussion in New Zealand: National guidelines*. https://www.acc.co.nz/assets/Uploads/National-concussion-guidelines-v4.pdf

Adams, E. (2010). The joys and challenges of semi-structured interviewing. *Community Practitioner*, *83*(7), 18–21.

Andrew, A. (2024). Aotearoa New Zealand general practice workforce crisis: What are our solutions? *Journal of Primary Health Care*, *16*(2), 214–217. https://doi.org/10.1071/HC23178

Badenhorst, M., Skilton, D., Zoellner, A., Lucas, P., Salmon, D. M., Walters, S., Mossman, K., Keung, S., Thompson, K., & Sole, G. (2025). Sport, healthcare and educational organisations' perceptions of a framework for managing concussion in New Zealand schools: A qualitative study. *Journal of Primary Health Care*, *17*(3), 251–258. https://doi.org/https://doi.org/10.1071/HC24190

Bastos Gottgtroy, R., Hume, P., & Theadom, A. (2022). Healthcare pathways for mild traumatic brain injury patients in New Zealand, determined from Accident Compensation Corporation data. *New Zealand Medical Journal*, *135*(1563), 36–51. https://doi.org/10.26635/6965.5821

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Choudhury, R., Kolstad, A., Prajapati, V., Samuel, G., & Yeates, K. O. (2020). Loss and recovery after concussion: Adolescent patients give voice to their concussion experience. *Health Expectations*, *23*(6), 1533–1542. https://doi.org/10.1111/hex.13138

Churchill, N. W., Hutchison, M. G., Graham, S. J., & Schweizer, T. A. (2021). Acute and chronic effects of multiple concussions on midline brain structures. *Neurology, 97*(12), e1170–e1181. https://doi.org/10.1212/WNL.0000000000012580

Dalton, M., Galea, O., Blyth, R., Reid, D., Quinn, D., Chua, J., & Sole, G. (2024). Aotearoa New Zealand physiotherapists' perspectives of potential expanded roles for sports-related concussion management: A qualitative study. *New Zealand Journal of Physiotherapy*, *52*(2), 113–125. https://doi.org/10.15619/nzjp.v52i2.390

Derbyshire, S., Maskill, V., & Snell, D. L. (2021). Do concussion clinicians use clinical practice guidelines? *Brain Injury*, *35*(12–13), 1521–1528. https://doi.org/10.1080/02699052.2021.1972451

Echemendia, R. J., Burma, J. S., Bruce, J. M., Davis, G. A., Giza, C. C., Guskiewicz, K. M., Naidu, D., Black, A. M., Broglio, S., Kemp, S., Patricios, J. S., Putukian, M., Zemek, R., Arango-Lasprilla, J. C., Bailey, C. M., Brett, B. L., Didehbani, N., Gioia, G., Herring, S. A., … Schneider, K. J. (2023). Acute evaluation of sport-related concussion and implications for the Sport Concussion Assessment Tool (SCAT6) for adults, adolescents and children: A systematic review. *British Journal of Sports Medicine*, *57*(11), 722–735. https://doi.org/10.1136/bjsports-2022-106661

Equestrian Sports New Zealand. (2020). *Concussion*. https://www.nzequestrian.org.nz/safety/concussion/

Feigin, V. L., Theadom, A., Barker-Collo, S., Starkey, N. J., McPherson, K., Kahan, M., Dowell, A., Brown, P., Parag, V., Kydd, R., Jones, K., Jones, A., & Ameratunga, S; for the BIONIC Study Group. (2013). Incidence of traumatic brain injury in New Zealand: A population-based study. *Lancet Neurology*, *12*(1), 53–64. https://doi.org/10.1016/s1474-4422(12)70262-4

Graves, J. M., Mackelprang, J. L., Moore, M., Abshire, D. A., Rivara, F. P., Jimenez, N., Fuentes, M., & Vavilala, M. S. (2019). Rural-urban disparities in health care costs and health service utilization following pediatric mild traumatic brain injury. *Health Services Research*, *54*(2), 337–345. https://doi.org/10.1111/1475-6773.13096

Hallock, H., Mantwill, M., Vajkoczy, P., Wolfarth, B., Reinsberger, C., Lampit, A., & Finke, C. (2023). Sport-related concussion: A cognitive perspective. *Neurology Clinical Practice*, *13*(2), Article e200123. https://doi.org/10.1212/CPJ.0000000000200123

Hind, K., Konerth, N., Entwistle, I., Hume, P., Theadom, A., Lewis, G., King, D., Goodbourn, T., Bottiglieri, M., Ferraces-Riegas, P., Ellison, A., & Chazot, P. (2022). Mental health and wellbeing of retired elite and amateur rugby players and non-contact athletes and associations with sports-related concussion: The UK Rugby Health Project. *Sports Medicine*, *52*(6), 1419–1431. https://doi.org/10.1007/s40279-021-01594-8

Hou, X., Zhang, Y., Fei, X., Zhou, Q., & Li, J. (2023). Sports-related concussion affects cognitive function in adolescents: A systematic review and meta-analysis. *The American Journal of Sports Medicine*, *51*(13), 3604–3618. https://doi.org/10.1177/03635465221142855

Kara, S., Crosswell, H., Forch, K., Cavadino, A., McGeown, J., & 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 Sport Medicine*, *30*(2), 96–101. https://doi.org/10.1097/jsm.0000000000000811

Kumar, A., Kara, S., van der Werf, B., & Fulcher, M. (2024). Can the Buffalo Concussion Treadmill Test be used as a prognostic indicator for patients with sport-related mild traumatic brain injury? *Clinical Journal of Sport Medicine*, *34*(2), 91–96. https://doi.org/10.1097/JSM.0000000000001170

Lambert, M., Sheldrake, E., Deneault, A.-A., Wheeler, A., Burke, M., & Scratch, S. (2022). Depressive symptoms in individuals with persistent postconcussion symptoms: A systematic review and meta-analysis. *JAMA Network Open*, *5*(12), Article e2248453. https://doi.org/10.1001/jamanetworkopen.2022.48453

Lincoln, Y., Lynham, S., & Guba, E. (2011). Paradigmatic controversies, contradictions, and emerging confluences, revisited. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research.* (4th ed., pp. 97–128). SAGE.

Malterud, K., Siersma, V., & Guassora, A. (2016). Sample size in qualitative Interview studies: Guided by information power. *Qualitative Health Research*, *26(13)*, 1753–1760. https://doi.org/10.1177/1049732315617444

Manley, G., Gardner, A. J., Schneider, K. J., Guskiewicz, K. M., Bailes, J., Cantu, R. C., Castellani, R. J., Turner, M., Jordan, B. D., Randolph, C., Dvořák, J., Hayden, K. A., Tator, C. H., McCrory, P., & Iverson, G. L. (2017). A systematic review of potential long-term effects of sport-related concussion. *British Journal of Sports Medicine*, *51*(12), 969–977. https://doi.org/10.1136/bjsports-2017-097791

Maxtone, S., Bishop, M., Chapple, C., Tumilty, S., Quinn, D., & Kennedy, E. (2020). Physiotherapist involvement in concussion services in New Zealand: A national survey. *New Zealand Journal of Physiotherapy*, *48*(2), 70–79. https://doi.org/10.15619/nzjp/48.2.03

McLeod, T. C. V., Williams, R. M., & Valier, A. R. S. (2024). The adolescent patient perspective on activity limitations following sport-related concussion. *Journal of Athletic Training, 59*(10), 984–990. https://doi.org/10.4085/1062-6050-0587.23

Ministry of Health. (2024). *Health and independence report 2023.* https://www.health.govt.nz/publications/health-and-independence-report-2023

New Zealand Football. (2024). *NZ football and concussion guidelines 2024*. https://www.nzfootball.co.nz/asset/downloadasset?id=77775be4-2854-4844-8d2f-ff9e17a2cc99

New Zealand Rugby. (2025). *Concussion: Graduated return to play (GRTP)*. https://www.nzrugby.co.nz/assets/GRTP-Concussion-Poster-31032025-poster-final-printer-A3.pdf

New Zealand Rugby League. (2025). *Concussion*. https://nzrl.co.nz/leaguesmart/concussion/#:~:text=The%20player%20MUST%20always%20be,21%20days%2C%20with%20NO%20exceptions

O'Reilly, M., Mahon, S., Reid, D., Hume, P., Hardaker, N., & Theadom, A. (2020). Knowledge, attitudes, and behavior toward concussion in adult cyclists. *Brain Injury*, *34*(9), 1175–1182. https://doi.org/10.1080/02699052.2020.1793386

Osman, S., Churruca, K., Ellis, L. A., & Braithwaite, J. (2024). Beyond the planned and expected: The unintended consequences of telehealth in rural and remote Australia through a complexity lens. *The Medical Journal of Australia*, *220*(10), 496–498. https://doi.org/10.5694/mja2.52294

Pappadis, M. R., Sander, A. M., Juengst, S. B., Leon-Novelo, L., Ngan, E., Bell, K. R., Corrigan, J. D., Driver, S., Dreer, L. E., & Lequerica, A. H. (2024). The relationship of health literacy to health outcomes among individuals with traumatic brain injury: A traumatic brain injury model systems study. *Journal of Head Trauma Rehabilitation*, *39*(2), 103–114. https://doi.org/10.1097/HTR.0000000000000912

Patricios, J. S., Schneider, K. J., Dvorak, J., Ahmed, O. H., Blauwet, C., Cantu, R. C., Davis, G. A., Echemendia, R. J., Makdissi, M., McNamee, M., Broglio, S., Emery, C. A., Feddermann-Demont, N., Fuller, G. W., Giza, C. C., Guskiewicz, K. M., Hainline, B., Iverson, G. L., Kutcher, J. S., … Meeuwisse, W. (2023). Consensus statement on concussion in sport: The 6th International Conference on Concussion in Sport – Amsterdam, October 2022. *British Journal of Sports Medicine*, *57*(11), 695–711. https://doi.org/10.1136/bjsports-2023-106898

Petrie, F. J., Mackintosh, K. A., Starbuck, C., Williams, E. M. P., & McNarry, M. A. (2024). Concussion response and recovery in men and women's rugby union: A reflexive thematic analysis of player interviews. *PloS One*, *19*(4), Article e0296646. https://doi.org/10.1371/journal.pone.0296646

Poloai, L., Fulcher, M., & Reid, D. (2023). The accuracy of coding for sports-related concussion in New Zealand: An observational study. *New Zealand Journal of Physiotherapy*, *51*(2), 100–104. https://doi.org/https://doi.org/10.15619/nzjp.v51i2.349

Putukian, M., Purcell, L., Schneider, K. J., Black, A. M., Burma, J. S., Chandran, A., Boltz, A., Master, C. L., Register-Mihalik, J. K., Anderson, V., Davis, G. A., Fremont, P., Leddy, J. J., Maddocks, D., Premji, Z., Ronksley, P. E., Herring, S., & Broglio, S. (2023). Clinical recovery from concussion – return to school and sport: A systematic review and meta-analysis. *British Journal of Sports Medicine*, *57*(12), 798–809. https://doi.org/10.1136/bjsports-2022-106682

Reid, D. A., Hume, P., Whatman, C., Theadom, A., Walters, S., Hardaker, N., & Fulcher, M. (2020). Knowledge, attitudes, and behaviours of New Zealand physiotherapists to sports-related concussion. *New Zealand Journal of Physiotherapy*, *48*(1), 19–28. https://doi.org/10.15619/NZJP/48.1.03

Salmon, D. M., Badenhorst, M., Falvey, É., Kerr, Z. Y., Brown, J., Walters, S., Sole, G., Sullivan, S. J., Whatman, C., Register-Mihalik, J., & Murphy, I. (2022). Time to expand the circle of care – General practitioners' experiences of managing concussion in the community. *Journal of Sports Sciences*, *40*(19), 2102–2117. https://doi.org/10.1080/02640414.2022.2130586

Salmon, D. M., Badenhorst, M., Sole, G., Sullivan, S. J., & Register-Mihalik, J. (2023). The balancing act – Physiotherapists' experiences of managing rugby-related concussion in the community. *Physiotherapy Theory and Practice*, 40(7), 1459–1476. https://doi.org/10.1080/09593985.2023.2170195

Salmon, D. M., McGowan, J., Sullivan, S. J., Murphy, I., Walters, S., Whatman, C., Keung, S., Clacy, A., & Romanchuk, J. (2020). What they know and who they are telling: Concussion knowledge and disclosure behaviour in New Zealand adolescent rugby union players. *Journal of Sports Sciences*, *38*(14), 1585–1594. https://doi.org/10.1080/02640414.2020.1749409

Salmon, D. M., Sullivan, S. J., Murphy, I., Mihalik, J. K. R., Dougherty, B., & McCrory, G. (2020). Square peg round hole – Time to customise a concussion assessment tools for primary care: The New Zealand experience? A call for a GP-SCAT. *Brain Injury*, *34*(13-14), 1794–1795. https://doi.org/10.1080/02699052.2020.1831607

Stuart, C., Reid, D., Theadom, A., Fulcher, M., & Hardaker, N. (2022). Knowledge and management of sport-related concussion in primary care in New Zealand. *New Zealand Medical Journal*, *135*(1548), 31–41.

Theadom, A., Chua, J., Sintmaartensdyk, A., Kara, S., Barnes, R., Macharg, R., Leckey, E., & Mirza, A. (2024). A supported primary health pathway for mild traumatic brain injury quality improvement report. *Journal of Primary Health Care*, *16*(3), 308–314. https://doi.org/https://doi.org/10.1071/HC23131

Theadom, A., Reid, D., Hardaker, N., Lough, J., & Hume, P. A. (2020). Concussion knowledge, attitudes and behaviour in equestrian athletes. *Journal of Science & Medicine in Sport*, *23*(11), 1055–1061. https://doi.org/10.1016/j.jsams.2020.05.008

Weishaar, M., Stephens, J., & Conner, B. (2024). Identifying sports-related concussion incidence, symptom reporting, and return to play risk factors in an adolescent sample: The effects of personality and social determinants of health. *Archives of Physical Medicine & Rehabilitation*, *105*(4), e169–e170. https://doi.org/10.1016/j.apmr.2024.02.593

Appendix A

QUOTES THAT SUPPORT THE THEMES

Theme quote number	Quote and participant code
	Theme 1: What RTP means to me
1–1	"…return to play could be anything from like, I'm a person who enjoys going for a run. And I'm like a jogger … it could also include someone who takes part in regular, like plays rugby, or races bikes, or whatever, and getting that person back to a place where they can be competing as they were pre-concussion." (GP 3)
1–2	"To me, it means observing them as they return to play through the various stages making sure that you have observed every stage they get to and ask them questions the next day … I like to be able to sort of let the doctor know, hey, I've watched them at training he's done his change of direction, he's done his rapid head movement and he's good to go to contact. And then also once the doctor's cleared them for contact also make sure you observe that contact session and check them out 24 hr later and as long as the symptoms are clear, return to play." (PT3)
1–3	"…you talk with them about what their expectation is first. And then you try and pull it back, depending on what symptoms they might still have or have just got over." (GP4)
1–4	"…I think it needs another level of interpretation for you to be able to personalise it to people … but thinking about it from like a different patient perspective … to try and get something that's personalised to that person in their reality, be it job, what sport they do, what level they do it at, it's really hard to personalise it for someone." (GP3)
1–5	"…what is meaningful to that person as well … I think it would be more important to connect with who they are and try and understand who their family ties are and where their whānau is from … just getting to know the individual is, that is most important thing." (PT5)
1–6	"…but the way that Māori and Pacific Islanders view an injury is very different as well. So to be able to just say that the SCAT questions, for instance, that are like 'I don't feel right' and 'feel more emotional', 'more irritable', that sort of stuff … I think, in my experience, these people are answering differently, and I don't think that necessarily reflects their cultural background." (PT3)
1–7	"Maybe having more involvement with the whānau to figure out if this person is going to tell you exactly what you want to hear so that they can get back to rugby straight away. Whereas if you'd actually had a discussion with the partner, or the parents or the siblings, and then the Mum's like, oh, actually he put orange juice in his Coco Pops instead of milk yesterday, whereas he's told you that I feel completely fine, then there's probably more things you are concerned about." (GP1)
1–8	"…also just to give you a general idea from family where they're at, are they irritable, have there been any mood changes and concentration and then basically just get them to monitor as well, I find it very important to get the family involved as well." (PT4)
1–9	"You need to have a relationship, you have to have a relationship. And also, it has to be relationship that the rest of your whānau trust as well. So if you are going to see a GP that you feel mismanaged your auntie, you are not going to trust that GP, gets complicated in rural areas where there aren't many options … there has to be a level of understanding and trust, and relationship and time." (GP2)
1–10	"I think that having conversations with that person about their reasons for wanting to return to play will also help to mitigate some of the issues with symptom reporting, if you spend more time building that relationship, which again, you could probably say that's a barrier to providing effective care under our existing funding model. It's you don't have the time or the capacity to." (PT2)
1–11	"…I think the education part is key because people need to like own it themselves. You need to make sure [as] they can lie to you and be like, 'I've got no symptoms, it's fine, I can go back', but I think if you explain it to people properly then they can … I think if you can make people take seriously what's actually going on with them. You need that critical part of it but that all takes time." (GP3)
1–12	"…sometimes there are varying degrees of health literacy among the people that I'll treat. So it may be that they are experiencing symptoms that they don't know that's a thing that they need to report, or they sort of don't necessarily understand the risks and ramifications in returning too early." (PT2)

Theme quote number	Quote and participant code
Theme 2: What influences how well I can help someone with RTP	
2–1	"I feel like it's a bit of a juggling act of deciding how long people need to have off depending on how bad symptoms are. … I'll normally say right, two weeks off post-concussion, and then go from there." (GP1)
2–2	"I guess the big overarching issue for me is the current process relies hugely … on the symptoms … sometimes they'll [athletes] say whatever you want to hear, to get back on the field. And then the other thing is, sometimes there are varying degrees of health literacy among the people that I'll treat. So it may be that they are experiencing symptoms that they don't know that's a thing that they need to report, or they sort of don't necessarily understand the risks and ramifications in returning too early." (PT2)
2–3	"Probably just chatting about that term, whakama, that some do know, some don't. That feeling of letting the team down feeling a bit stink. So discussing that, but again, not going beyond my scope as a physiotherapist." (PT3)
2–4	"Then you're dealing with personalities, you're dealing with people, there's a lot of peer pressure, you're dealing with lots of lots of things that are all subjective. And you know, you have players, they'll go to five to 10 people or go to three different doctors to get the opinion they want." (PT1)
2–5	"…we have a lot of shearing gangs … if they're out shearing all day … two hours from anywhere, and they had a head knock on Saturday, they're like, it'll be fine … On Sunday our practice isn't open, then them trying to get in on a Monday, well, one, they're probably in the shearing van already … so people just aren't going to show up." (GP1)
2–6	"And that's an hour cost appointment to the patient … having to charge a surcharge, that's going to be even more challenging to get people to come in for that one more appointment … the advent of telehealth and the fact that ACC is also remunerating us to telehealth … I will do a telehealth with them after their first contact training and a telehealth with them after the game … just catch up to make sure that they passed and ticked everything, we don't charge a surcharge for those sort of telehealth, so it is a free service." (PT2)
2–7	"Cost is definitely part of it … in [rural town name], they're going to have to try [the GP] and if they're lucky, they'll get a spot on the list that day, and then they've got to pay to come in as well. And if you've got to get them in for the initial and then you've got to get them in for a couple of follow-ups, you're looking at 100 bucks in three consults … plus whatever cost it's going to be for seeing the physio[therapist] and getting an assessment from that side of things as well." (GP1)
2–8	"If they don't pass [the medical clearance assessment], you then can't book them in for repeat in a week or two weeks. It's a repeat in four weeks, which is there's no ability to sort of work with people to upscale." (GP2)
2–9	"…the hardest part was actually getting them into their doc[tor] enough and effectively lodging the concussion … I can put down a contusion to the head, but as soon as I put concussion on an ACC form, they say 'no you can't diagnose it', which is probably my biggest thing is … I think any physio[therapist] can, even a new graduate can diagnose a suspected concussion." (PT3)
2–10	"I think they're [GPs] just very constrained, I think they just don't have the time and I think very often, they just don't also know what to do with it and straight after they very often refer back to physio[therapy] … patients get lost in the system." (PT3)
2–11	"I had a concussion this year … and my GP, tried to just write me off … for four weeks to do nothing and that was it and she's a good GP, but that's what her knowledge around concussion and what I needed to do was, I referred myself to a physio[therapist] … It's comical now, in the sense that I didn't really recognise I had a concussion for three days and, you know, been trying to self-treat anyway. But I referred myself to a physio[therapist] at a week and that was the best thing I did. That was the only thing that was helpful." (GP3)
2–12	"…[after referral back to GP] don't know if they've got a medical clearance or not, they just go into the ether." (PT4)
2–13	"…often I'm not catching these people acutely … probably it's coming really clear [from] this conversation is the timeframe and how delayed my input really is." (PT5)
2–14	"My experience is it doesn't currently work well … [We] don't have open lines of communication. So that needs to be ensured." (PT5)
2–15	"I think I've had just a few letters back … But considering the number of people that I've seen, and the struggles in getting that onward referral and care … It would be nicer to get a quicker speedier service." (GP4)

Theme quote number	Quote and participant code
2–16	"It depends a little bit on whether I'm seeing them at a sports field or at a ski field, or in an emergency department, or whether I'm seeing them as a GP. If you think you're at ED, it'd be the diagnosis side of things, they wouldn't probably be managing the return of play aspects, they would hand that over to the GP to do … or if you're doing after hours, you might have a situation where somebody comes to you for the clearance to say I want to go back and play, and so you might have to make a clinical decision around whether they have recovered enough or not." (GP4)
2–17	"…that is probably one of the things I struggle with, with lots of the rugby stuff and lots of the guidelines … that says you need to get a medical clearance before you go back. It's really vague what that is. And does that mean you can go and see a nurse in a rural clinic [for medical clearance] … I think it's intentionally vague, to make it workable. But then why have it?" (GP3)
2–18	"…21 days off before you can do anything I think is too arbitrary." (GP3)
2–19	"It's based on symptomatology more and then the timing … you've got quite strict guidelines around when they can return, particularly in rugby. But I've always seen that as more of a minimum than a target. So if their symptoms are still severe at that point, I would be pretty unlikely to clear them to go back onto the field." (GP2)
2–20	"…you see a different GP, and they're going to give you a completely different plan, or some will sign you off when some wouldn't. Which isn't really good enough, when you're using GP clearance as the standard to go back to the field, it needs to be standardised. So I'm very aware that it's not standardised. At the moment you go and see someone who's time poor, they'll just sign people off, might see somebody else who has a much higher threshold." (GP2)
2–21	"…they just went to the urgent doctors here and the doctor assessed her. And she said, 'no, I've got no symptoms … I'm fine.' And the doctor cleared her." (PT3)
2–22	"…it needs to be better training. How that would happen, from a timing point of view is impossible. You know, we're being sent training modules for everything under the sun … and there's only so many … training modules you can do." (GP2)
2–23	"…there is only one other physio[therapist] I'm aware that has treated concussion this year for the sport. So, no I don't feel like I have other colleagues that I can call on very freely." (PT5)
Theme 3: Communities and connections	
3–1	"…that should be part of what training should be. It's not just running around the field and passing the ball. There's a little bit of Blackboard stuff … concussion? How do you get back to playing, you know, in a real positive sort of way. And so that should be part of it. We shouldn't be afraid to talk about it." (GP4).
3–2	"…having very easily accessible educational resources pitched at different levels. So you could have a package that was kind of like, offered as part of a coaching programme, for example of, 'here's some things to keep an eye out for in your athlete as they return'." (PT2)
3–3	"Well, often they will come with whānau, depending on the age, of course. At other times, they won't. And sometimes they'll indicate that they need to report back to coach or family or work. … Whether what you say gets converted back … correctly is another matter." (GP4)
3–4	"I'd get ACC, to actually fund education for the coaches. Okay. And to use physio[therapist]s to do it, because they're good at it. Yeah and respected by the sports people." (GP4)
3–5	"We've got three physio[therapist]s in town. All of whom are completely slammed, one of them only works two days a week … suggested to them going down to training and stuff, the answer is no. Just due to limited capability." (GP1)
3–6	"I think if I was in a situation where I had a physio[therapist] that I knew, who sent me an email and said, 'Hey, I'm sending in X person to come and have a [medical], they need their sign off' … I would have a lot more confidence that that person was getting better care … I think the information that a physio[therapist] can get from a patient can be quite different from what a doctor can get. It's just a slightly different relationship." (GP3)
3–7	"I think it's a really natural kind of partnership and I think they both have areas that they like their skills will kind of complement each other because, feedback from a lot of GPs that we've talked to is that they don't want to be kind of solely managing this and that they don't have the time for it … making things relevant for the patient, that's something that we have to do all the time with exercise programming." (PT2)

Theme quote number	Quote and participant code
3–8	"I'm quite glad that I send people to physio[therapist]s, because … within 15 minutes for me to actually assess someone, have these conversations, try and come up with a suitable kind of ideas around activity is nearly impossible. Plus, I don't really have a good understanding … that ability to follow up and actually physically see how people are going as well. … I'm just taking their word for it a lot of the time." (GP2)
3–9	"I've been sent a couple of patients I've had nothing to do with except for the fact that they need this GP medical clearance. … it's really, really hard to have someone turn up in your office saying, I want medical clearance and you've never met them before. You have no history on what's going on. Probably you need a second set of eyes with the GP being involved … you would want that to be a GP who's actually adding value, rather than just a rubber stamp." (GP2)
3–10	"…we probably just need to be a little bit less high and mighty about saying that doctors are the only ones to do it. … I think that should be changed. Because I mean, we don't get taught about concussion at medical school, specifically, or making a diagnosis using modern evidence-based stuff. So there should be like an alternative qualification to say you can do it. I think that'd be more helpful." (GP3)
3–11	"And that's the biggest thing, is quick access for diagnosis … because [if] physio[therapist]s can diagnose it, then you don't need the quick access. So that's the sort of thing if ACC want to go … Let the physio[therapist] diagnose it on the weekend." (PT3)
3–12	"So they say they must be cleared by a GP … we've already covered everything … they've been able to return to high-intensity activities symptom-free, they've been able to complete two full-on non-contact sessions symptom-free … I think at the end of the day to make a call on someone going back … I think the physiotherapist is still in the best position to make that decision. But I don't believe that legally, we're in a position to be able to make a decision without a doctor." (PT1)
3–13	"…how do we continue to strengthen the links between GPs and their local physios, so that physiotherapists can be more involved in this because … I think it was 45% of them or something didn't feel confident managing the return to play process." (PT2)

Note. GP = general practitioner; PT = physiotherapist.