

# Defining the role of sport and exercise physicians: the experience of different referrer types in New Zealand

Brendon Aubrey <sup>1</sup>, Mark L Fulcher,<sup>2,3</sup> Duncan Reid <sup>4</sup>

**To cite:** Aubrey B, Fulcher ML, Reid D. Defining the role of sport and exercise physicians: the experience of different referrer types in New Zealand. *BMJ Open Sport & Exercise Medicine* 2024;**10**:e001968. doi:10.1136/bmjsem-2024-001968

Accepted 15 April 2024

## ABSTRACT

The aim of this study was to analyse the reasons health professionals refer to sport and exercise physicians (SEPs) and to define what service gap the specialty fills. This was a qualitative study design using thematic analysis. Online focus group interviews consisting of 4–6 participants in each group were conducted separately with physiotherapists, emergency clinicians, general practitioners and orthopaedic surgeons practising in New Zealand. Thematic analysis of the focus group interviews was then used for the identification of common themes around referral tendencies towards SEPs. Three primary themes were identified relating to referrals towards SEPs: (1) role utilisation of SEPs, (2) collaboration and (3) accessibility. SEPs are viewed as experts in the assessment, investigation and diagnosis of musculoskeletal (MSK) conditions, including some which might traditionally be viewed as surgical diagnoses. Some confusion or lack of understanding exists regarding the range of conditions that SEPs can treat and manage, with some referrers assuming that SEPs only treat sport-related injuries. SEPs are often used alongside other specialist practitioners in the management of patients with MSK conditions. This requires collaboration with other health professionals who also treat MSK conditions to ensure the best patient outcome. A common feeling towards SEPs is they are easily accessible compared with other potential health providers who may also treat MSK conditions such as orthopaedic surgeons and general practitioners, and that SEPs provide sound management plans and access to investigations such as MRI, in a timely fashion.

## INTRODUCTION

The Australasian College of Sport and Exercise Physicians was founded in 1985 and represents sport and exercise physicians (SEPs) working in Australia and New Zealand.<sup>1</sup> Globally, sport and exercise medicine (SEM) is a relatively new specialty, however, compared with most other countries it is better established in Australia and New Zealand. SEM has certainly been taught through various institutions for over a century resulting in ‘sports medicine doctors’, however, SEM has only gained recognition as a ‘specialty’ in some countries in more recent times. (thus producing ‘SEPs’)<sup>1 2</sup> In most countries, the title ‘SEM’

## WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Very little is known about referral habits of health practitioners and the utilisation of sport and exercise physicians (SEPs) in Australia and New Zealand given the relatively young age of the Australasian College of Sport and Exercise Physicians. Current literature suggests some confusion still exists about the role of SEPs.

## WHAT THIS STUDY ADDS

⇒ Better understanding of current perceptions of where sport and exercise medicine (SEM) fits in the New Zealand healthcare landscape.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ By helping define the service gap currently SEM fills in New Zealand in comparison to the overall scope of practice of SEM, further advocacy for recognition as a vital specialty is needed to achieve improved patient access SEPs through policy development and government funding in line with other medical specialties.

as opposed to ‘sports medicine’ is used to reflect the importance of physical activity in the management of many health conditions.<sup>3</sup> Due to SEM being a relatively new specialty, some referrers may not have adequate understanding of the role of SEPs, which can lead to a hesitancy to refer. This has been demonstrated in the UK where a lack of awareness of the role of the SEP within the National Health System led to suboptimal utilisation, especially for patients who could benefit from increasing their physical activity levels.<sup>4</sup>

The scope of practice of SEPs focuses on protecting and promoting the health of individuals and communities, primarily managing musculoskeletal (MSK) conditions. In Australia, the majority of patients seen by SEPs are relatively complex, having one or more associated comorbidities and about half of patients seen have had symptoms that have been present for >12 months. Most patients seen by SEPs are referred by a general practitioner and have often had prior consultation



© Author(s) (or their employer(s)) 2024. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

<sup>1</sup>Australasian College of Sport and Exercise Physicians, Melbourne, Victoria, Australia

<sup>2</sup>Axis Sports Medicine, Auckland, New Zealand

<sup>3</sup>University of Auckland, Auckland, New Zealand

<sup>4</sup>Department of Physiotherapy, AUT, Auckland, New Zealand

## Correspondence to

Dr Brendon Aubrey;  
brendon.aubrey@gmail.com

with physiotherapists or orthopaedic surgeons. Prescription of exercises and/or therapeutic intervention is a common outcome following consultation with SEPs. Patient demographics range from elite athletes and teams to middle or older age groups with acute and chronic MSK conditions with associated comorbidities.<sup>5</sup>

The potential value of SEPs is clear given that MSK-related pain and disability are a leading cause of reduced health and significant economic costs worldwide.<sup>6-8</sup> In 2019, MSK conditions comprised 17% of global years lived with disability.<sup>9</sup> The prevalence and impact of MSK conditions will continue to rise, as most painful MSK conditions are associated with an increase in age, other comorbidities (ie, obesity, diabetes) and reduced activity levels.<sup>10</sup> MSK conditions are often not seen in isolation, particularly in the ageing population. It is common for both MSK and other chronic medical conditions to coexist, leading to the so-called burden of multimorbidity. The appropriate management of MSK conditions is crucial to the overall morbidity and quality of life for patients with multimorbidity.<sup>11</sup>

In New Zealand, many referral sources exist for SEPs, including primary care physicians, allied health professionals and other medical specialists. Referral tendencies have been evaluated for many specialties but the reasons for referring (or hesitancy to refer) specifically to SEPs is not well understood.<sup>12-15</sup> Referral patterns across other specialties are relatively complex. For example, Tzartzas *et al* found that referrals by general practitioners to specialists in tertiary healthcare centres are not just based on the medical condition of the patient but take into account the relationships between doctor, patient and other referrers. Factors such as patient emotions, earning specialist esteem, sharing responsibility and seeking validation from colleagues play a role in the decision to refer.<sup>15</sup>

Overall, there appears to be very limited literature looking at reasons for referral patterns among health professionals with regard to SEPs. The purpose of this study is to provide some answers as to why potential referrers do (or do not) refer to SEPs. This information will have real-world relevance to help define the service gap SEPs fill in the healthcare landscape (what SEPs do that other clinician types do not) in comparison to services currently delivered by other clinicians.

## METHOD

This study used four focus groups to investigate common themes relating to why other health professionals refer to SEPs, with a key aim to develop common themes among referrers.

### Participant recruitment

The recruitment of participants was achieved through advertisements in local employee email newsletters for practitioners in Auckland, New Zealand. Clinicians-based outside of Auckland who had previously referred patients to SEPs were also invited to participate. The target groups included registered physiotherapists, general

practitioners, orthopaedic surgeons and emergency department clinicians. All respondents willing to participate were sent more detailed information about the study and a consent form. Participants signed a consent form prior to the focus group meeting commencing allowing for all discussions to be video recorded.

### Focus group protocol

The individual focus groups consisted of eight physiotherapists, four general practitioners, four orthopaedic surgeons and five emergency department clinicians, as well as the three authors of the study. Informed consent was provided by all focus group participants. The groups met online via Zoom for approximately 1 hour each. Indicative questions were used to encourage conversation regarding referrals to SEPs. Focus group meetings were video recorded and transcribed.

### Procedure

All focus groups were conducted online by two moderators, the primary researcher and a coauthor and lasted no longer than 1 hour. The primary researcher attended all focus groups and ensured the meetings were video recorded.

The discussion in each focus group commenced with a short introduction and a brief explanation of the session by the primary researcher. Each participant was given time to introduce themselves to other group members. The primary researcher then asked the first indicative question and allowed participants to answer and discuss among the group. Participants were always given enough time to discuss their opinions. The participants were encouraged to have an open discussion, however, when all opinions regarding a particular topic had been expressed, the next indicative question was asked by one of the moderators.

### Data analysis

Data analysis was conducted by the primary researcher and coauthors. Focus group discussions were video recorded and transcribed verbatim by the primary researcher to reduce the possible loss of data. Thematic analysis was then used to deductively and inductively identify patterns or themes within the qualitative data.<sup>16</sup>

After review of the transcripts from each focus group, responses from the participants were used to create subthemes. Using a well-documented step-by-step process, these subthemes were then condensed into three primary themes to represent the overall narrative of the data collected.<sup>17</sup>

## RESULTS

Following thematic analysis of the focus group meeting transcripts, three key themes were identified. The first theme, role utilisation, was identified based on participants describing the many reasons they might refer to SEPs, including specific conditions and the recognition that SEPs are considered to be excellent diagnosticians

in the area of MSK medicine and provide expert non-surgical management. The second theme, collaboration, was identified based on participants describing experiences of sharing patient care with SEPs. The third theme, accessibility, was identified based on participants describing different aspects of accessing SEPs through various avenues, including some of the challenges faced.

### Theme 1: role utilisation

In all focus groups, there appeared to be a consistent understanding of the role SEPs play in managing MSK patients. It was clear that participants believed that SEPs could offer expert advice and non-surgical management for MSK presentations, including minor procedures (eg, injections) beyond what can be offered by other health professionals. In New Zealand, SEPs are able to arrange imaging such as MRI which is not available for some referring participants (physiotherapists and general practitioners).

Physiotherapist: ‘... I tend to refer for a couple of reasons. One, if I’m unsure of the diagnosis and want to either exclude or confirm a diagnosis I think that the opportunity to have somebody who’s got a specialist set of eyes on a condition helps me in that management. The second reason might be, perhaps for a patient’s confidence that I’ve got the right diagnosis and that we’re on the right plan, and just to get that confirmed by a SEP can be affirming to the client and check we’re on the right track...’

General Practitioner: ‘... I think often the SEP is a good option, especially in physically active people, because you can have surgery for things, but sometimes there are other options...’

Orthopaedic surgeon: ‘... I just think that you guys are much better at taking a holistic approach and having more options available. You could talk about injectables. You’re rehab specialists. You’re exercise specialists. You can tailor a rehab program much better than an orthopaedic surgeon...’

The participants in each focus group were consistent in listing specific MSK conditions and some medical conditions they would often refer to SEPs. This appeared to be in the setting of escalating treatment for conditions that were not improving or required adjunct treatment offered by SEPs. Education and reassurance for patients were also featured in the participant responses.

General Practitioner: ‘... Back pain, musculoskeletal conditions not needing surgical management or just wanting a second opinion, frozen shoulder sometimes...’

Emergency Clinician: ‘... Previously I would have not referred a few things like concussion, but my understanding is the concussion rules have loosened up a bit so we can refer a lot more things like concussion to SEPs...’

Physiotherapist: ‘...Definitely more education around and more myth busting around osteoarthritis facilitating the active approach...’

Orthopaedic Surgeon: ‘... Going joint by joint, with respect to shoulders, any impingement, adhesive capsulitis, partial thickness cuff tears, full thickness cuff tear in a patient who I don’t think is a primarily a surgical candidate. With hips, any labral tear or pathology without a significant cam (lesion). Also around the hip, the tendinopathies are a common presenting problem. The other ones I’ll refer on is anyone who’s got a concern about a compartment syndrome, because my SEP colleagues will do the exercise testing like compartment pressures...’

Interestingly, some participants were not fully aware of the role SEPs play in treating non-athletes or patients who are not physically active, including an assumption that SEPs prefer not to see older patients with a chronic condition such as osteoarthritis.

Physiotherapist: ‘... I actually thought they had to play sport to be referred to you guys. I think with my non-sporting people I’ve sent them to other people. That’s good to know after 20 years of sending you people!’

Orthopaedic surgeon: ‘... I was always a little unsure about referring someone that I thought might have an inflammatory arthropathy or something like that. Do you guys want to see those patients? Do you want to see the patients that I think have psychological issues? Or chronic pain issues? I honestly don’t think I want to send these because I don’t want to send these patients through to my sports medicine colleagues but it would actually be really good if you said ‘I want to see all those’.

Orthopaedic surgeon: ‘... I feel like the older patient as well, the 60 or 70 year old who’s got mild degenerative OA (osteoarthritis), that’s not really why people became SEPs, that’s not what they envisioned seeing in their clinics’...

Emergency Clinician: ‘... Traditionally, the main impediment for me was that I always thought (for referrals) they have to be simply sport focussed. I see now that we can refer a lot more things that are a bit more broad spectrum to our colleagues...’

### Theme 2: collaboration

It was generally acknowledged that SEPs play an important role in conjunction with other clinicians to best manage patients using a collaborative approach. Many examples were given where participants described comanaging patients to ensure the best outcome for patients.

Orthopaedic surgeon: ‘... Some of the younger athletes with stress fractures. I think it’s a collaborative approach with sports medicine. I think my expertise is based in terms of saying ‘how much force can your bone take?’. The other additional things that the



dietitian can help, the SEP, the environment, all that stuff, that's a collaborative approach and that's where SEPs are much better trained in terms of the medical aspects...'

Emergency Clinician: '... I tend to refer to Physios while they (the patient) wait for their sports medicine appointment because we know we can already start some rehab. I think the earlier we get some rehab going before they see you guys. It just gives an extra layer (of treatment) before the patient gets to the SEPs...'

In New Zealand, the presence of 'MSK physicians' appears to have led to some uncertainty about who to refer complex MSK cases to as the scope of practice for SEPs is perhaps not well understood by other health professionals.

General Practitioner: '... I've thought there is probably a little bit of confusion among some General Practitioners between what is a 'Musculoskeletal Specialist' and what is a 'SEP'. When I talk to some GPs they think it's the same thing. I think clarification of the scopes of practice and differences (is needed). There is obviously some crossover, but I think it is challenging for some...'

### Theme 3: accessibility

The consensus from the four focus groups was that SEPs are very accessible to see patients in a timely manner. General practitioners and physiotherapists frequently mentioned that they will often refer to SEPs when considering imaging such as an MRI, which is more easily obtained through referral to an SEP in New Zealand.

The triage process used by some SEM clinics, such as a dedicated acute knee injury clinic, allows specific subgroups of patients to be seen quickly so they may undergo further investigations and begin treatment without unnecessary delay.

General Practitioner: '... If the diagnosis is a little unclear, or we feel like they need more advanced imaging that we can't access immediately or it hasn't shown up anything that we've expected, then get another opinion (from a SEP) in terms of is high tech imaging required. I think that's often a consideration...'

Emergency Clinician: '... It's all about expediency. We'll see that they (SEPs) offer a whole bunch of therapies that can be used for the patients recovery. Unfortunately a lot of our suitable colleagues are so inundated with referrals that they don't necessarily get to see those referrals very quickly. Whereas the SEPs have the knowledge of the condition, but they can refer to a surgeon as well. With my referral process, because they've got a wealth of knowledge that's over and above what I have, and they can offer a variety of treatment streams as well...'

One of the key differences between New Zealand and Australia in accessing SEPs is the so called 'gatekeeper' referral system, in that to be seen by an SEP in Australia a referral from another doctor, whether that be a general practitioner or other specialist, is required to see an SEP.<sup>18</sup> This is not the case in New Zealand where any practitioner can refer directly to an SEP. This was seen as a significant advantage for patients in the New Zealand healthcare system.

Physiotherapist: '... It (The Australian model) would definitely be a lot harder because a lot of people want to see you guys (SEPs) as soon as possible and want the answer. And that's normally why we tend to refer people to you guys, so it would be frustrating...'

Despite an overall feeling that SEPs are generally readily accessible, with the recognition SEM has gained it was noted that appointment waiting times are starting to increase.

General Practitioner: '... In the old days we could get people into SEPs a lot faster than we could orthopaedics, and often they could be managed with expertise while they were waiting for an orthopaedic assessment. That's not necessarily the case anymore...'

### DISCUSSION

The results of this thematic analysis have defined the role of SEPs as currently perceived by common referrers in New Zealand. SEPs are viewed as specialists who possess the expertise and skillset to manage complex MSK cases and play an important role in health advocacy to ensure patients remain active. Primary care clinicians, and those working within an emergency department, reported referring more complex patients to SEPs for further evaluation as they perceived them to have better training for this type of patients. The current study has also demonstrated that SEPs are seen to be excellent collaborators among other health professionals who see similar patients and when compared with other types of specialists are more accessible.

The results of the current study are also consistent with findings from a recent Australian-based study that concluded there is a lack of understanding of the role SEPs play in the broader healthcare landscape and are also consistent with findings from the UK.<sup>4 19</sup> The most common misconceptions in the study by Ooi *et al* were that SEPs did not want to see patients who were not already physically active, those with more complex non-communicable diseases and older patients.<sup>19</sup>

Patients who are not considered athletes or physically active comprise a large cohort of patients currently seen by SEPs, in particular older patients with osteoarthritis.<sup>5</sup> It was evident in the focus group meetings that some referrers were unaware of the breadth of patients commonly seen by SEPs and assumed patients must either be involved in sports in some capacity or be regular participants in physical activity to be deemed an appropriate referral. This raised some discussion about the use of 'Sport' in the SEP title and whether this contributed to some confusion about the conditions SEPs

treat. Ultimately, however, there seemed to be a consensus that use of the word 'Sport in the SEP title should be retained, but that more education to potential referrers regarding the role of SEPs would be useful. The three primary themes that have been identified in the current study, role utilisation, collaboration and accessibility, are supported by previous studies that discuss the continuing evolution and challenges faced by SEM as a specialty.<sup>3-5</sup>

### What is the role of an SEP?

SEPs appear to be viewed as experts in the assessment, investigation and diagnosis of MSK conditions, including some which might traditionally be viewed as surgical diagnoses. As the role of SEPs has emerged and evolved, so has the appreciation that some MSK conditions that were previously managed with surgery may now be managed non-surgically under the guidance of SEPs. Examples include the management of anterior cruciate ligament injuries, with the emergence of a novel bracing protocol showing promise as a non-operative management strategy and the treatment of Achilles tendon ruptures.<sup>20 21</sup> Osteoarthritis was also mentioned as a condition that most focus group participants felt used SEPs. The emergence of non-surgical interventions such as novel injectable therapies as well as further knowledge about the benefits of exercise to manage osteoarthritis has meant SEPs play an integral role in managing this condition.<sup>22</sup> As with other non-communicable diseases, it was noted that osteoarthritis can be a complex problem to manage and requires adequate consultation time to discuss the many treatment strategies and provide patient education. Study participants felt that SEPs have both the expertise and time available to provide this care. Participants also believed that SEPs had an important role to play in the management of mild traumatic brain injury (mTBI) and a range of non-communicable diseases.

Participants also highlighted that SEPs are good leading and working within interdisciplinary teams. A good example of this involved the management of sports-related concussion (SRC). Over the past decade, there has been an increased focus on the burden of SRC, especially injuries that occur while playing sport. SRC can result in significant medical issues which are frequently challenging to manage, often requiring input from a group of clinicians. SEPs have an important role in leading these interdisciplinary teams and helping to manage these complex conditions.<sup>23</sup> Cardiac screening for elite athletes is another example of a complex medical issue that is unique to the exercising individual that is often managed by a multidisciplinary team, including SEPs due to their specialist training in this area and intimate involvement in competitive sport.<sup>24</sup>

### Accessibility

As previously mentioned, SEM is a relatively new specialty in medicine, and this likely contributes to SEPs being accessible by patients to receive expedient treatment. As SEM continues to become more established, it is expected that referral numbers will increase and that this will lead to longer patient waiting times (unless the SEP workforce also increases with

referrer demand). The future increase in demand for SEPs may be felt more in Australia than New Zealand given the different referral systems, with Australian patients requiring a referral from a treating doctor to be seen by an SEP.

Another important aspect regarding accessibility specific to New Zealand is the presence of the Accident Compensation Corporation (ACC), a compulsory insurance fund designed to provide financial cover and support for any injured person in New Zealand.<sup>25</sup> This system likely results in less financial barriers for injured patients in New Zealand to access SEPs and receive care. Conversely, the presence of the ACC may also lead to SEPs in New Zealand seeing less medical conditions and more MSK injuries compared with their Australian colleagues.

### Clinical implications and future directions

By capturing the opinions of common referrers to SEPs, this study can serve to enhance the development of SEM and delivery of medical care to patients. It is clear that the members of the focus groups in the current study value the presence of SEPs in the healthcare landscape and that SEPs have an important role in the management of complex MSK and medical problems. Unfortunately, this study has shown that there is a lack of understanding and awareness of the role SEPs play in patient care. It is likely that this affects the potential impact of SEPs. Strategies are needed to try to address this. For example, there are currently a limited number of universities that have started working with SEPs to develop a more robust curriculum to teach medical students the value of exercise medicine and physical activity promotion prior to entering the workforce.<sup>26</sup> In addition, providing practical teaching rotations in physical medicine and rehabilitation units for senior medical students could also enhance clinical skills, awareness and knowledge in the area of SEM.<sup>27</sup> This would include training in management of paediatric sports medicine, as it has previously been identified that Paediatricians receive very little training in this area and are often not comfortable in managing a range of MSK presentations.<sup>28</sup>

Finally, having an SEM presence in the public hospital system would also serve to provide specialist care by SEPs to the broader community and ensure accessibility outside the private healthcare sector. This would likely also lead to a better understanding of the role SEPs play among other healthcare providers due to better visibility in the public hospital system.<sup>29-31</sup> In order to establish the presence of SEM in the public hospital sector, this requires better recognition of SEM as a medical specialty and adequate funding by key stakeholders.<sup>3</sup>

### Limitations

All of the participants in the current study had referred patients to a single sports medicine clinic in Auckland, New Zealand. This is likely to have led to selection bias of focus group participants and may result in generalisation of the findings towards other regions or countries. This may have been compounded further by other aspects of the study methodology. For example, given that our focus group participants had to volunteer an hour of their time, we suspect that

practitioners who participated in our study were more likely to be those who view SEPs in a positive light, which likely led to a bias of opinions. The small number of participants in each group may also lead to selection bias.

## CONCLUSION

Input from referrers to SEPs in New Zealand has helped identify themes relating to referral tendencies which can be used to better understand and implement the role of SEPs. SEPs were generally regarded as being experts in the management of various complex MSK pathology, including some conditions which have typically been viewed as surgical problems. SEPs were also identified as being experts in the management of mTBI and in the management of complex medical/non-communicable conditions. Within our cohort, there generally appears to be a good understanding of the role SEPs play in patient care, however, there still remains some confusion. Further education and/or promotion to potential patients and referrers may be needed.

**Contributors** Data collection: BA, MLF and DR. Data analysis: BA, MLF and DR. Article write-up: BA, MLF and DR. Guarantors: BA and MLF

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Not applicable.

**Ethics approval** This study involves human participants and was approved by Auckland University of Technology Ethics Committee (AUTC), approval number 22/370. Participants gave informed consent to participate in the study before taking part.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Data are available on reasonable request.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

## ORCID iDs

Brendon Aubrey <http://orcid.org/0009-0005-3799-3645>

Duncan Reid <http://orcid.org/0000-0002-8989-800X>

## REFERENCES

- 1 Australasian College of Sport and Exercise Physicians. SEM physicians. ACSEP; 2022. Available: <https://www.acsep.org.au/page/about/the-college/history>
- 2 Popovic BL. Sports medicine: a historical perspective with special reference to Eastern Europe. *Aspetar Sports Medicine Journal* 2015;574–81.
- 3 Carrard J, Morais Azevedo A, Gojanovic B, et al. Sport and exercise medicine around the world: global challenges for a unique healthcare discipline. *BMJ Open Sport Exerc Med* 2023;9:e001603.
- 4 Kassam H, Tzortziou Brown V, O'Halloran P, et al. General practitioners' attitude to sport and exercise medicine services: a questionnaire-based survey. *Postgrad Med J* 2014;90:680–4.
- 5 Gamage PJ, Seker S, Orchard J, et al. Insights into the complexity of presentation and management of patients: the sport and exercise physician's perspective. *BMJ Open Sport Exerc Med* 2021;7:e001228.
- 6 Briggs AM, Woolf AD, Dreinhöfer K, et al. Reducing the global burden of musculoskeletal conditions. *Bull World Health Organ* 2018;96:366–8.
- 7 James SL, Abate D, Abate KH, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the global burden of disease study 2017. *The Lancet* 2018;392:1789–858.
- 8 Meisingset I, Vasseljen O, Vollestad NK, et al. Novel approach towards musculoskeletal phenotypes. *Eur J Pain* 2020;24:921–32.
- 9 Blyth FM, Briggs AM, Schneider CH, et al. The global burden of musculoskeletal pain—where to from here. *Am J Public Health* 2019;109:35–40.
- 10 Briggs AM, Huckel Schneider C, Slater H, et al. Health systems strengthening to arrest the global disability burden: empirical development of prioritised components for a global strategy for improving musculoskeletal health. *BMJ Glob Health* 2021;6:e006045.
- 11 Duffield SJ, Ellis BM, Goodson N, et al. The contribution of musculoskeletal disorders in multimorbidity: implications for practice and policy. *Best Pract Res Clin Rheumatol* 2017;31:129–44.
- 12 Chan BTB, Austin PC. Patient, physician, and community factors affecting referrals to specialists in Ontario, Canada. *Medical Care* 2003;41:500–11.
- 13 O'Malley AS, Reschovsky JD. Referral and consultation communication between primary care and specialist physicians: finding common ground. *Arch Intern Med* 2011;171:56–65.
- 14 Thorsen O, Hartveit M, Baerheim A, et al. The consultants' role in the referring process with general practitioners: partners or adjudicators? A qualitative study. *BMC Fam Pract* 2013;14:153.
- 15 Tzartzas K, Oberhauser P-N, Marion-Veyron R, et al. General practitioners referring patients to specialists in tertiary healthcare: a qualitative study. *BMC Fam Pract* 2019;20:165.
- 16 Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006;3:77–101.
- 17 Maguire M, Delahun B. Doing a thematic analysis: a practical, step-by-step guide for learning and teaching scholars. *ALL Ireland Journal of Higher Educations* 2017;9.
- 18 Hegney D, Price K, Patterson E, et al. Australian consumers' expectations for expanded nursing roles in general practice—choice not gatekeeping. *Aust Fam Physician* 2004;33:845–9.
- 19 Ooi JJY, Hutchinson R, Harris GA. Confusion among doctors regarding sports and exercise medicine as a specialty: an Australian multidisciplinary, cross-sectional survey. *BMJ Open* 2023;13:e072979.
- 20 Filbay SR, Dowsett M, Chaker Jomaa M, et al. Healing of acute anterior cruciate ligament rupture on MRI and outcomes following non-surgical management with the cross bracing protocol. *Br J Sports Med* 2023;57:1490–7.
- 21 Willits K, Amendola A, Bryant D, et al. Operative versus nonoperative treatment of acute achilles tendon ruptures. *J Bone Jt Surg* 2010;92:2767–75.
- 22 Ayhan E, Kesmezacar H, Akgun I. Intraarticular injections (corticosteroid, hyaluronic acid, platelet rich plasma) for the knee osteoarthritis. *World J Orthop* 2014;5:351–61.
- 23 Patricios JS, Schneider KJ, Dvorak J, et al. Consensus statement on concussion in sport. *Br J Sports Med* 2022;57:695–711.
- 24 Drezner JA, Sharma S, Baggish A, et al. International criteria for electrocardiographic interpretation in athletes: consensus statement. *Br J Sports Med* 2017;51:704–31.
- 25 Accident compensation corporation. ACC; 2024. Available: [www.acc.co.nz](http://www.acc.co.nz)
- 26 Asif I, Thornton JS, Carek S, et al. Exercise medicine and physical activity promotion: core curricula for US medical schools, residencies and sports medicine fellowships: developed by the American Medical society for sports medicine and endorsed by the Canadian Academy of sport and exercise medicine. *Br J Sports Med* 2022;56:369–75.
- 27 Faulk CE, Mali J, Mendoza PM, et al. Impact of a required fourth-year medical student rotation in physical medicine and rehabilitation. *Am J Phys Med* 2012;91:442–8.
- 28 Purcell L, Campos S, Dickinson M, et al. 116 Canadian community paediatricians' perspectives of sport medicine in residency and in practice. *Paediatrics & Child Health* 2021;26.
- 29 Alanko L, Laukkanen JA, Rottensteiner M, et al. Sports and exercise medicine clinic in public hospital settings: a real-life concept and experiences of the treatment of the first 1151 patients. *Medrxiv* [Preprint] 2023.
- 30 Watura C, O'Halloran P, Maffulli N, et al. The profile of patients attending national health service sport and exercise medicine clinics: a questionnaire based survey. *Br J Sports Med* 2013;47:e4.
- 31 Nicholson D. Sports doctor recruited to unique position in Cairns hospital. Cairns Post; 2023. Available: <https://www.cairnspost.com.au/lifestyle/health/sports-doctor-recruited-to-unique-position-in-cairns-hospital/news-story/577a67d7b4317fae2419693dee74446e>