

Do patients discharged from advanced practice physiotherapy-led clinics re-present to specialist medical services?

Angela T. Chang¹ BPhy(Hons), PhD, Principal Project Officer

Belinda Gavaghan² BSpPath(Hons), MPH, DrPH, Advanced Workforce Officer

Shaun O'Leary^{1,3} BPhy(Hons), MPhy (Msk St), PhD, Senior Research Fellow

Liza-Jane McBride² BPhy, GradDipOHS, GradCertHM, Team Leader

Maree Raymer^{1,4} BPhy(Hons), MPhySt(MSK), MHM, Program Manager State wide Neurosurgical and Orthopaedic Physiotherapy Screening Clinics and Multidisciplinary Service

¹Department of Physiotherapy, Royal Brisbane and Women's Hospital, Level 2, Ned Hanlon Building, Butterfield Street, Herston, Qld 4029, Australia. Email: angela.chang@health.qld.gov.au

²Allied Health Professions' Office of Queensland, Clinical Excellence Division Department of Health, Queensland Government, Level 1, 15 Butterfield Street, Herston, Qld 4006, Australia. Emails: belinda.gavaghan@health.qld.gov.au; Liza-Jane.McBride@health.qld.gov.au

³School of Health and Rehabilitation Sciences, The University of Queensland, Therapies Building (84A), Services Road, St Lucia, Qld 4072, Australia. Email: s.oleary@uq.edu.au

⁴Corresponding author. Email: maree.raymer@health.qld.gov.au

Abstract

Objective. The aim of the present study was to determine the rates of re-referral to specialist out-patient clinics for patients previously managed and discharged from an advanced practice physiotherapy-led service in three metropolitan hospitals.

Methods. A retrospective audit was undertaken of 462 patient cases with non-urgent musculoskeletal conditions discharged between 1 April 2014 and 30 March 2015 from three metropolitan hospitals. These patients had been discharged from the physiotherapy-led service without requiring specialist medical review. Rates and patterns of re-referral to specialist orthopaedic, neurosurgical, chronic pain, or rheumatology services within 12 months of discharge were investigated.

Results. Forty-six of the 462 patients (10.0%) who were managed by the physiotherapy-led service were re-referred to specialist medical orthopaedic, neurosurgical, chronic pain or rheumatology departments within 12 months of discharge. Only 22 of these patients (4.8%) were re-referred for the same condition as managed previously and discharged.

Conclusions. Ninety-five per cent of patients with non-urgent musculoskeletal conditions managed by an advanced practice physiotherapy-led service at three metropolitan hospitals did not re-present to access public specialist medical services for the same condition within 12 months of discharge. This is the first time that re-presentation rates have been reported for patients managed in advanced practice physiotherapy services and the findings support the effectiveness of these models of care in managing demand for speciality out-patient services.

What is known about the topic? Advanced practice physiotherapy-led services have been implemented to address the needs of patients referred with non-urgent musculoskeletal conditions to hospital specialist out-patient services. Although this model is widely used in Australia, there has been very little information about whether patients managed in these services subsequently re-present for further specialist medical care.

What does this paper add? This paper identifies that the majority (95%) of patients managed by an advanced practice physiotherapy-led service did not re-present for further medical care for the same condition within 12 months of discharge.

What are the implications for practitioners? This paper supports the use of advanced practice physiotherapy-led services in the management of overburdened neurosurgical and orthopaedic specialist out-patient waiting lists.

Received 19 October 2016, accepted 25 March 2017, published online 15 May 2017

Introduction

Approximately 6.9 million Australians (30%) are affected by arthritis or some other musculoskeletal condition.¹ These conditions are a substantial burden to the individual's quality of life, and an economic burden to both the individual and society. Chronic musculoskeletal conditions are the third most commonly managed condition by general practitioners in Australia.² These patients are frequently referred to public hospital orthopaedic and neurosurgical out-patient clinics for specialist opinion and management.³ In Queensland, as in other Australian states, these referrals can be associated with prolonged waiting periods, attracting political attention.⁴ A review of Queensland hospital performance data indicates that up to 60% of patients referred to Orthopaedic or Neurosurgery out-patient services wait longer than clinically recommended periods for a specialist out-patient appointment.⁵

Advanced practice physiotherapy services were first reported in the UK as a strategy to manage lengthy specialist out-patient waiting lists^{6–8} and are now in place in other jurisdictions.^{9–11} These models use experienced physiotherapists with postgraduate education in managing patients with complex musculoskeletal conditions to address the needs of patients referred to hospital specialist out-patient services. Typically, these advanced physiotherapists provide triage, assessment, intervention and onward referral to other allied health professionals and medical specialists for patients with non-urgent conditions.¹² These models of care have contributed to shorter waiting times for patients, funnelling of more appropriate referrals to medical specialists^{10,13,14} and more timely and appropriate interventions for patients who are not appropriate for or are unlikely to benefit from surgical intervention.^{13,15} They have been found to be as beneficial as, or more beneficial than, traditional service models in terms of access to treatment, diagnostic accuracy and patient satisfaction.¹⁶ Research has shown that these models also contribute to more timely provision of care for appropriate patients.¹⁶

In Australia, many hospital services have trialled and subsequently embedded advanced practice physiotherapy models in their orthopaedic and neurosurgery services in order to improve access to timely and appropriate care.^{3,10,11,17} State and territory health departments have supported the introduction and widespread use of these roles on the basis of their ability to provide safe and effective patient care and deliver improved organisational outcomes while better using the skills of the entire health workforce.^{12,18–20}

In Queensland, the Neurosurgical and Orthopaedic Physiotherapy Screening Clinic and Multi-disciplinary Service (N/OPSC&MDS) was trialled and rolled-out state wide to assist in managing specialist out-patient waiting lists. The N/OPSC&MDS is now an integral component of specialist out-patient services in 16 public hospitals across Queensland, helping to alleviate specialist out-patient demand by managing a high volume of new case referrals.²¹ Within this service, the physiotherapist team leader works with an advanced scope of practice, undertaking the comprehensive initial assessment, diagnosis and management planning for patients who would otherwise be seen by a medical specialist and then coordinates the pragmatically delivered evidence-based multidisciplinary intervention program. The service has also received widespread stakeholder

support, including acceptance by patients,²² because it provides more timely access to appropriate (multidisciplinary) care for these patients on orthopaedic and neurosurgical waiting lists compared with the traditional specialist-led model of care. A recent cost-effectiveness analysis found that N/OPSC&MDS is a highly cost-effective addition to usual care and may be cost-saving.²³ Of the 23 420 patients discharged from the N/OPSC&MDS state wide in the period 1 April 2012–31 August 2016, 68% were discharged from the specialist out-patient waiting list without requiring specialist neurosurgical or orthopaedic consultation.²¹ The remaining 32% of patients were discharged with a recommendation that further review by a medical specialist was indicated. However, what is unknown is whether patients who are discharged without seeing a medical specialist are being re-referred to specialist orthopaedic or neurosurgical out-patient services (or other relevant services such as chronic pain or rheumatology) for further assessment or management of the same condition.

To date, there has been no investigation as to the pattern of re-referral for patients discharged from specialist out-patient waiting lists. Re-referral may occur for a variety of reasons, such as patient preference for medical review, dissatisfaction with the outcomes achieved by the initial service provided or deterioration in the patient's condition requiring further review and management. If the re-referral is for the same condition as managed previously by the service, this represents an additional cost to the overall health system. This may also have implications on the cost-effectiveness of the model and the service's contribution to the management of lengthy specialist out-patient waiting lists.

The present study addressed this unknown service metric by determining re-referral rates to specialist out-patient clinics (orthopaedic, neurosurgical, chronic pain and rheumatology) for patients previously managed and discharged by the N/OPSC&MDS without medical specialist consultation in three metropolitan hospitals.

Methods

Design

A retrospective audit of the records of patients discharged from the N/OPSC&MDS in three metropolitan hospitals within Queensland between 1 April 2014 and 30 March 2015 was undertaken. The hospitals were located within one health service district. Facility A is a public tertiary referral hospital with 1024 beds, Facility B is a public tertiary hospital with 624 beds and Facility C is a public hospital with 352 beds. The project was approved by The Prince Charles Hospital Human Research Ethics Committee (HREC) with exemption of full ethics review on the basis that the project was an audit/quality assurance project (Approval no. HREC/16/QPCH/163).

Patients

In all, 711 patients were identified as having been discharged from the three N/OPSC&MDS hospital sites between 1 April 2014 and 30 March 2015. Of these patients, 462 (65%) were discharged from the N/OPSC&MDS without specialist medical consultation and were included in the audit. The remaining 249 patients were excluded from the study because the advanced practice

physiotherapist had already recommended that further review by a medical specialist was required.

Data collection

All new referrals accepted by the orthopaedic, neurosurgery, chronic pain or rheumatology specialist out-patient clinics within 12 months of the date of discharge for each patient were included. A copy of the new referral, triage category, type of specialist clinic and status of the new referral were recorded from paper-based and electronic hospital information systems. Copies of the original referral, which was managed by the N/OPSC&MDS, and clinic management notes were extracted from the medical records.

Two investigators (ATC and BG) reviewed all new referrals and compared them to records from the original N/OPSC&MDS management. Five inclusion and exclusion criteria (Table 1) were applied to determine whether the new referral was for the same condition as managed previously by the N/OPSC&MDS.

Each reviewer independently assessed all referrals using the specified inclusion and exclusion criteria. Findings were compared and any inconsistencies between the two reviews were managed through discussion. If reviewers were unable to reach a consensus, it was assumed that the referral was related to the condition previously managed by the N/OPSC&MDS. This conservative approach to the classification of new referrals ensured results would only overestimate rather than underestimate rates of re-referral. The medical records of patients with identified re-referrals were reviewed and information regarding the management and outcome of the new referral and subsequent consultations was collated.

Data analysis

Descriptive analysis of data was undertaken using Microsoft (Armonk, NY, USA) Excel version 14. Some patients had multiple new referrals to the health service in the 12-month follow-up period. For the purposes of analysis, each patient was identified as either having one or more re-referrals, or no re-referrals. Re-referrals were further examined by body region and outcome of subsequent management.

Results

Demographics

The mean (\pm s.d.) age of the 462 patients on the date of discharge from the N/OPSC&MDS was 51 ± 21 years) with 239 (51.7%) being female. In all, 57 new referrals to specialist medical

orthopaedic, neurosurgery, chronic pain or rheumatology services were identified for 46 patients (10.0%) within 12 months of discharge from the N/OPSC&MDS.

Re-referral rates within 12 months of discharge

From the 57 new referrals, 24 (42%) were identified as being for a condition that was previously managed by the N/OPSC&MDS. The remaining 33 referrals were for a different condition than the one previously managed. The 24 re-referrals were related to 22 original patients, representing a total re-referral rate of 4.8%. Reviewer consensus as to whether the new referral constituted a re-referral was not reached for two referrals due to a lack of detail in the documentation available. These two new referrals were counted as re-referrals for the purposes of the analysis.

Re-referral rates by body region

Overall re-referral rates for all conditions, as a percentage of condition-specific discharges, were similar (0–9%; Table 2). Patients with lumbosacral spine conditions accounted for the most re-referrals (11 patients; 50%). However, this represented only 6.3% of the original patients discharged with lumbosacral spine conditions.

Outcome of re-referral

The outcome of the re-referral to specialist medical services for the 22 patients identified is outlined in Table 3. Six of these patients were reviewed in an advanced practice allied health clinic and the remaining 16 were already reviewed, or were awaiting review, by specialist medical services. Allocation of the new referral was based on existing institutional triage processes. Overall, eight re-referred patients (1.7%) were discharged from the waiting list following review and conservative management. One of these patients (0.2%) had further investigation and was offered surgery, but declined and was subsequently discharged. A further nine patients (1.9%) have had or are awaiting surgery. Three patients (0.6%) are still under review, including undertaking conservative management, and the remaining two patients (0.4%) are still waitlisted for medical specialist review.

Discussion

The present study is the first to evaluate the rate of patient re-referral to medical or surgical specialist clinics following discharge from an advanced practice physiotherapy-led service

Table 1. Inclusion and exclusion criteria

To be classified as a re-referral, referrals had to meet any one of the inclusion criteria listed. Referrals meeting any of the exclusion criteria were excluded from the analysis. N/OPSC&MDS, Neurosurgical and Orthopaedic Physiotherapy Screening Clinic and Multi-disciplinary Service

Inclusion criteria	The condition outlined in the new referral documentation is related to the same region of the body as the primary region managed during N/OPSC&MDS attendance, as recorded in hospital information systems There is a statement in the referral documentation that the referral is repeat or re-referral to access the specialist medical out-patient service or N/OPSC&MDS for management The diagnosis in the referral documentation is the same diagnosis as identified on the original referral or by N/OPSC&MDS management records
Exclusion criteria	The new referral contains specific information that highlights new trauma or injury to the same body region/s, including on the same limb if appropriate The condition outlined in the new referral is related to a different body region/s than that previously managed in the N/OPSC&MDS

Table 2. Re-referral rates by region

N/OPSC&MDS, Neurosurgical and Orthopaedic Physiotherapy Screening Clinic and Multi-disciplinary Service

Body region originally managed in the N/OPSC&MDS	No. patients originally discharged (%)	No. re-referrals (%)
Cervical spine	60 (13.0)	3 (13.6)
Thoracic spine	5 (1.1)	0 (0.0)
Lumbosacral spine	176 (38.1)	11 (50.0)
Hip	15 (3.3)	1 (4.5)
Knee	95 (20.6)	3 (13.6)
Foot or ankle	13 (2.8)	0 (0.0)
Shoulder	84 (18.2)	3 (13.6)
Elbow	3 (0.7)	0 (0.0)
Wrist or hand	11 (2.4)	1 (4.5)
Total	462	22

Table 3. Subsequent management pathway for patients re-referred (n = 22)

Note, percentages are calculated using the total number of patients discharged (n = 462). GP, general practitioner

Management pathway	No. patients (%)
Discharged for ongoing management by GP ^A	8 (1.7)
Awaiting or have had surgery ^B	9 (1.9)
Ongoing conservative management and review by advanced practice allied health or specialist medical clinic	3 (0.6)
Outcome unknown as still wait listed for review	2 (0.4)
Total	22 (4.8)

^AOne patient had further investigations, declined surgery and was subsequently discharged.^BThe types of surgery included transforaminal lumbar interbody fusion, cervical disc replacement, total hip replacements, tibial tuberosity transfer and medial patellofemoral reconstruction, total knee replacement, ulnar nerve release and endoscopic carpal tunnel release. In addition, one patient was also re-referred for rheumatology review and was discharged for ongoing management by their GP.

across multiple facilities. In the present study we found that over 95% of patients who were discharged from the N/OPSC&MDS without requiring specialist medical review did not re-present to the health service within 12 months for further management of their original condition. Of the 4.8% of patients who were re-referred to specialist out-patient clinics, only nine (1.9%) went on to have management that differed from the recommended care at discharge from the N/OPSC&MDS. A further eight patients (1.7%) may have received additional non-surgical intervention, such as allied health treatment, and were subsequently discharged from the health service. Importantly, from a service safety perspective, there were no indications in the medical records that any of these re-referrals were on the basis of a potentially overlooked red flag. Red flags are signs and symptoms observed during the patient history and clinical examination that may indicate a serious pathology associated with the disorder that warrants consultation with a medical physician for further investigation and diagnosis.²⁴ The records indicate that re-referral was on the basis of deterioration, or unsatisfactory further improvement, of their condition requiring additional attention.

Re-referral to chronic pain and rheumatology services were tracked in addition to re-referrals to orthopaedic and neurosurgery services. This ensured we accounted for subsequent referrals to other specialist out-patient services to which patients with musculoskeletal conditions may be referred. We were unable to make comparisons with other studies due to a lack of published information regarding re-referral rates for other health services, including advanced practice allied health-led or specialist medical and surgical out-patient services.

The findings of the present study further support the effectiveness of an advanced practice physiotherapy-led service model from both a health service and clinical perspective, as reported previously in the literature.^{16,23} The small proportion of patients requiring re-referral indicates that the service effectively manages patients with non-urgent musculoskeletal disorders, with sustainable benefits for overburdened neurosurgical and orthopaedic services. In addition, re-referral rates were low regardless of the body region affected. With growing evidence of clinical and cost-effectiveness, further work is now required to identify the optimal scale and mix of advanced practice physiotherapy-led and specialist medical services required to manage the demand for orthopaedic and neurosurgery specialist out-patient services.

Consideration also needs to be given to the redesign of referral processes so that these patients have access to and receive timely and high-quality care by a health professional who is best able to address their needs. This may include direct access to advanced practice physiotherapy-led services. However, the authors recognise that caution must be taken to ensure that lengthy specialist out-patient waiting lists are not simply transferred to allied health-led services. Further research is required to investigate the potential advantages and disadvantages, including costs, of enabling direct referrals to advanced allied health-led services over the short, medium and long term.

Limitations

The present study audited three metropolitan hospitals within one health service in Queensland. The model described in this study is currently implemented in 16 facilities across Queensland, including metropolitan and regional facilities. Therefore, some caution should be taken in generalising results to other advanced practice physiotherapy-led services in neurosurgery and orthopaedics. Some variation in referral patterns may be present, including patient access to other public and private service options. Furthermore, there is now a need to investigate representation rates in other advanced practice allied health models, such as those in audiology and speech pathology. Potentially, results may be different in other speciality areas.

In the present study, a 12-month follow-up period was used to allow time for patients to return to their primary care provider and to seek a repeat referral for their condition if, for example, they were dissatisfied with the outcome of their N/OPSC&MDS management or preferred to be seen by a medical specialist. A longer follow-up period may have identified a higher rate of re-referral, but the results would more likely be confounded by the chronic nature of the musculoskeletal conditions with which these patients were initially referred, which have the potential for deterioration over time. Finally, only new referrals to public orthopaedic, neurosurgery, chronic pain or rheumatology

specialist services within the same health service were included in the study. Access to other specialist services, such as public facilities outside the health service or to the private sector, were not included. It would be beneficial for future research studies to consider strategies to include new referrals across health services and in private facilities in the audit process, potentially via electronic patient records such as the MyHealth Record. In addition, the present study was limited to an audit of medical records within the participating public hospitals and therefore we have no way of knowing what care pathway the patients who were not re-referred to participating hospitals pursued (if any) outside the public hospital system following discharge. Identification of this information in future studies may be useful to determine the demands on other health services (e.g. private hospitals) these patients may impose despite discharge from the public health system.

Other factors may have also affected the findings, such as the accuracy of general practitioner referrals. Potentially, a general practitioner may refer symptoms in the same area of the body as two different regions on two separate occasions. In addition, there may be the potential for two conditions (i.e. a neck and a shoulder condition) to coexist and be initially overlooked. However, we are confident that our strict inclusion criteria will have minimised inaccuracies due to these factors.

Conclusion

The present study found that 95% of patients with non-urgent musculoskeletal conditions who were discharged from an advanced practice physiotherapy-led service were not re-referred for the same condition to specialist medical out-patient clinics (orthopaedic, neurosurgery, chronic pain, rheumatology) within the following 12 months. This is the first time that re-presentation rates have been reported for patients managed in these services. The findings of the study indicate that advanced practice physiotherapy-led services contribute to effective and sustainable specialist out-patient wait list management by providing appropriate services for patients not requiring medical or surgical intervention.

Competing interests

None declared.

Acknowledgements

The authors acknowledge the support and assistance provided by the clinical and administrative staff of the Neurosurgical and Orthopaedic Physiotherapy Screening Clinics and the administrative staff from the Health Information Services at the Royal Brisbane and Women's Hospitals, The Prince Charles Hospital and Redcliffe Hospital. This project was funded by the Allied Health Professions Office of Queensland, Department of Health (Qld).

References

- 1 Australian Institute of Health and Welfare (AIHW). Australia's health 2016. Australia's Health Series no. 15. Catalogue no. AUS 199. Canberra: AIHW; 2016.
- 2 Britt H, Miller G, Charles J, Henderson J, Bayram C, Pan Y, Valenti L, Harrison C, O'Halloran J, Fahrudin C. General practice activity in Australia 2009–10. General Practice Series no. 27. Catalogue no. GEP 27. Canberra: Australian Institute of Health and Welfare; 2010.
- 3 Oldmeadow LB, Bedi HS, Burch HT, Smith JS, Leahy ES, Goldwasser M. Experienced physiotherapists as gatekeepers to hospital orthopaedic outpatient care. *Med J Aust* 2007; 186: 625–8.
- 4 Curtis AJ, Russell CO, Stoelwinder JU, McNeil JJ. Waiting lists and elective surgery: ordering the queue. *Med J Aust* 2010; 192: 217–20.
- 5 Queensland Health. Queensland reporting hospitals: quarterly information for specialist outpatient at 1 July 2016. 2016. Available at: <http://www.performance.health.qld.gov.au/hospitalperformance/op-main.aspx?hospital=99999> [verified 22 September 2016].
- 6 Byles S, Ling R. Orthopaedic out-patients – a fresh approach. *Physiotherapy* 1989; 75: 435–7. doi:10.1016/S0031-9406(10)62619-3
- 7 Durrell S. Expanding the scope of physiotherapy: clinical physiotherapy specialists in consultants' clinics. *Man Ther* 1996; 1: 210–3. doi:10.1054/math.1996.0271
- 8 Hockin J, Bannister G. The extended role of a physiotherapist in an out-patient orthopaedic clinic. *Physiotherapy* 1994; 80: 281–4. doi:10.1016/S0031-9406(10)61050-4
- 9 Aiken A. Improved use of allied health professionals in the health care system: the case of the advanced practice physiotherapist in orthopedic care. *World Hosp Health Serv* 2012; 48: 28–30.
- 10 Blackburn MS, Cowan SM, Cary B, Nall C. Physiotherapy-led triage clinic for low back pain. *Aust Health Rev* 2009; 33: 663–70. doi:10.1071/AH090663
- 11 Schoch PA, Adair L. Successfully reforming orthopaedic outpatients. *Aust Health Rev* 2012; 36: 233–7. doi:10.1071/AH11040
- 12 Queensland Health. Ministerial Taskforce on health practitioner expanded scope of practice: final report. Brisbane: Queensland Government; 2014.
- 13 Napier C, McCormack RG, Hunt MA, Brooks-Hill A. A physiotherapy triage service for orthopaedic surgery: an effective strategy for reducing wait times. *Physiother Can* 2013; 65: 358–63. doi:10.3138/ptc.2012-53
- 14 Stanhope J, Grimmer-Somers K, Milanese S, Kumar S, Morris J. Extended scope physiotherapy roles for orthopaedic outpatients: an update systematic review of the literature. *J Multidiscip Healthc* 2012; 5: 37–45.
- 15 Wood L, Hendrick P, Boszczyk B, Dunstan E. A review of the surgical conversion rate and independent management of spinal extended scope practitioners in a secondary care setting. *Ann R Coll Surg Engl* 2016; 98: 187–91. doi:10.1308/rcsann.2016.0054
- 16 Desmeules F, Roy JS, MacDermid JC, Champagne F, Hinse O, Woodhouse LJ. Advanced practice physiotherapy in patients with musculoskeletal disorders: a systematic review. *BMC Musculoskelet Disord* 2012; 13: 107. doi:10.1186/1471-2474-13-107
- 17 Morris J, Grimmer-Somers K, Kumar S, Murphy K, Gilmore L, Ashman B, Perera C, Vine K, Coulter C. Effectiveness of a physiotherapy-initiated telephone triage of orthopedic waitlist patients. *Patient Relat Outcome Meas* 2011; 2: 151–9.
- 18 ACT Health. Physiotherapy extended scope practice: phase 1. Final report. 2008. Available at: <http://www.unisa.edu.au/PageFiles/68220/Preparatory%20documents/Physiotherapy%20Extended%20Scope%20of%20Practice,%20Phase%201,%20Final%20Report.pdf> [verified 21 December 2016].
- 19 Department of Health and Human Services, State Government of Victoria. Advanced practice in allied health. 2015. Available at: <https://www2.health.vic.gov.au/health-workforce/allied-health-workforce/advanced-practice-in-allied-health> [verified 21 December 2016].
- 20 Department of Health, Government of Western Australia. WA Health expanded scope of practice physiotherapy project. A literature overview. 2015. Available at: <http://www.ochpo.health.wa.gov.au/docs/ExpandedScopeofPracticePhysiotherapy-ALiteratureOverview.pdf> [verified 21 December 2016].
- 21 Queensland Health. Neurosurgery and Orthopaedic Physiotherapy Screening Clinics activity benchmarking report 2015/16. Brisbane: Queensland Health; 2016.

- 22 Smith D, Raymer M. Orthopaedic physiotherapy screening clinics – an approach to managing overburdened orthopaedic services. *Physiotherapy* 2007; 93: 746.
- 23 Comans T, Raymer M, O’Leary S, Smith D, Scuffham P. Cost-effectiveness of a physiotherapist-led service for orthopaedic outpatients. *J Health Serv Res Policy* 2014; 19: 216–23. doi:[10.1177/1355819614533675](https://doi.org/10.1177/1355819614533675)
- 24 Sizer PS Jr, Brismee JM, Cook C. Medical screening for red flags in the diagnosis and management of musculoskeletal spine pain. *Pain Pract* 2007; 7: 53–71. doi:[10.1111/j.1533-2500.2007.00112.x](https://doi.org/10.1111/j.1533-2500.2007.00112.x)