

# Management of Musculoskeletal Disease and Exercise in Primary Care

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**Abstract:** Musculoskeletal conditions represent among the largest reasons for years dealt with disability in high-income economies. These conditions are primarily managed in medical care settings, and yet, there is a paucity of evidence on which approaches work well in increasing the uptake of finest practice and in closing the evidence-to-practice space. Significantly, musculoskeletal models of service delivery (as components of designs of care) such as incorporated care, stratified care and therapist-led care have actually been evaluated in main health care pathways for joint pain in older adults, for low neck and back pain and for arthritis. In this chapter, we discuss why application of these designs is important for primary care and how designs are carried out using three case examples: we review application theory, outcomes and concepts; we consider the function of health financial assessment; and we propose key proof spaces in this field. We propose the following research study top priorities for this location: examining the generalizability of models of care throughout, for example, rural and city settings, and for different musculoskeletal conditions; increasing support for self-management; comprehending the importance of context in picking a model of care; detailing how implementation has been carried out; and examination of application and its impact.

The main objective of this review is to establish the impact upon patients and health services, of substituting doctors with physiotherapists in the management of common musculoskeletal disorders.

**Keywords:** Management of musculoskeletal, high-income economies.

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## 1. INTRODUCTION

Musculoskeletal disorders are the second largest cause of disability in developed countries <sup>[1-3]</sup>. They are linked by the presence of pain and impaired function <sup>[4]</sup>, but as individual conditions, their heterogeneity dictates varied management spanning emergency settings for acute injuries, to dedicated rheumatology pathways for chronic inflammatory autoimmune disease <sup>[5]</sup>. The majority of musculoskeletal disorders present to primary care as non-urgent, non-inflammatory problems and approximately one third receive specialist referral, most often to orthopedics <sup>[6]</sup>. Chronicity is common and prevalence is greater in the elderly. Consequently the burden of musculoskeletal disease is predicted to increase as the population ages <sup>[2]</sup> and thus intensify the strain on already challenged public health services.

A strategy aiming to address this burden, by improving access for patients <sup>[7]</sup>, reducing cost and addressing workforce shortages <sup>[8]</sup>, is the substitution of doctors with physiotherapists in the management of musculoskeletal disorders. Professional substitution is the transfer of work normally performed by one profession (in this case doctors), to other professionals <sup>[8]</sup>, either through the transfer of specific duties, or complete role substitution <sup>[7]</sup>. While definitions vary internationally advanced practice (within defined professional scope <sup>[9]</sup> and extended scope (beyond the usual scope of the profession <sup>[9]</sup> physiotherapy roles can substitute for the usual doctor by providing musculoskeletal care that was previously the sole domain of medically trained doctors <sup>[10-12]</sup>. Yet regardless of whether the physiotherapist is practicing within or beyond the usual scope of the profession, the nature of these roles and the autonomy of physiotherapists in them, can vary considerably <sup>[12, 13]</sup>. Furthermore, legislative advances such as prescribing rights for physiotherapists in the UK <sup>[13, 14]</sup> have not been replicated internationally. This variability suggests uncertainty about how to most efficiently utilize physiotherapists within contemporary musculoskeletal healthcare delivery.

In deciding whether to employ a physiotherapist to deliver aspects of care in the place of a doctor, health funders and service providers require intelligence about the marginal impact of the substituted physiotherapist; this includes evidence of the safety, efficacy and economic value of physiotherapist care, in comparison to that care being delivered the usual doctor. However, little is known about the outcomes of care from physiotherapists in comparison with doctors because evidence synthesis to date <sup>[11, 12, 15, 16]</sup> has relied predominantly upon single-group observational case-series and quasi-experimental pre-post designs, which lack a comparison group providing usual care from doctors, and do not quantify the impact of the substitute professional. Furthermore, these designs do not control for factors that can affect patient outcomes and are therefore prone to biased estimation of the impact of care delivered by substitute professionals [8]. Through undertaking a systematic review, this study aims to establish the impact upon patients and health services, of substituting doctors with physiotherapists in the management of common musculoskeletal disorders. This review is the first to evaluate the impact of substituting doctors with physiotherapists in the management of common adult musculoskeletal disorders, by evaluating only studies that measure the outcomes care of delivered by a physiotherapist compared with the usual doctor.

## 2. METHODOLOGY

Medline, CINAHL and ABI Complete databases were searched electronically up to November 2015 with terms to capture physiotherapy professional substitution, terms to capture musculoskeletal disorders and terms to exclude emergency settings and inflammatory disorders (Appendix A contains the full electronic search). As outcomes under investigation include resources, costs and processes, we included ABI Complete along with the clinical research databases to capture any publications in economic or management publications. In addition to electronic searches, reference lists of studies from the electronic search, published reviews and policy documents were manually searched.

## 3. RESULTS AND DISCUSSION

### *General description of studies:*

Fourteen research studies of mixed methodological design fulfilled the addition requirements . One study reported long term outcomes in a separate publication <sup>[25]</sup>, resulting in an overall of fifteen consisted of publications (summarized in Table 1). In 8 studies (three randomized controlled trials, three non-randomized trials and 2 retrospective case analyses), participants were allocated to see physio therapists or physician (general practitioners in three research studies and orthopedic medical professionals of differing seniority in 5 studies). The staying six research studies were inter-rater arrangement designs in which a physio therapist and an expert orthopedic cosmetic surgeon each examined the exact same individuals, to compare decision-making by the two professions. 2 of these likewise compared participant fulfillment rankings for each profession. Patients in 3 research studies <sup>[26-28]</sup> were post-arthroplasty orthopedic center patients, while all other research studies consisted of patients at earlier points in their management pathway, before surgical decisions had actually been made. A variety of result steps were reported, spanning varied patient groups and precluding meta-analysis.

### **Quality and risk of bias:**

Research studies got typically moderate to poor quality rankings using the Downs and Black checklist. Total ratings ranged from 7 to 20 from a possible score of 28 (Appendix B), with a variety of methodological shortcomings determined. Clinical trials were generally provided with limited controls; the three randomized regulated trials did not blind participants or assessors, and in one of the three non-randomized clinical trials <sup>[39]</sup>, the physiotherapist had the ability to go over cases with the orthopedic surgeon, thus jeopardizing the integrity of the intervention group. Junior physicians, or doctors of varying seniority were utilized in four of the 5 research studies comparing physio therapists with doctors in an orthopedic setting <sup>[27, 28, 32, 39]</sup>. The 6 agreement research studies were likewise evaluated with the QAREL checklist (Appendix C). Only one study reported an effort to blind individuals or avoid them from possibly transferring details between inspectors. One study included a within trial financial analysis <sup>[32, 40]</sup> and scored 14 out of a possible 19 on the Evers Checklist <sup>[41]</sup> Twelve of the 14 consisted of studies used selective inclusion and exemption criteria which reduced the intricacy of the research study population and rendered the study accomplice potentially various to the typical clientele of the medical service under examination. Referrals believed to have greater diagnostic uncertainty or complexity, or patients thought most likely to need surgery in orthopedic settings, were often excluded (see Table 1 column titled Population).

**Health outcomes:**

**Five moderate to low quality studies suggest there is no significant difference in health outcomes derived from substituting a doctor with a physiotherapist:**

Health outcomes (consisting of condition-specific and quality of life steps) were reported in 5 studies. There were no reported significant or severe unfavorable occasions attributed to professional substitution. An overall of 14 health outcomes (explained in Table 1) reported across four research studies <sup>[25, 28, 32, 36, 38]</sup> showed no total significant difference in patient health results in between care delivery by a physiotherapist compared to the typical doctor (Table 2). The just reported result favoring either profession remained in a poor quality trial <sup>[39]</sup> reporting a significant result in favor of physiotherapy on a post-hoc analysis of one non-validated outcome procedure.

**Eight moderate to low quality studies suggest patients are equally or more satisfied with consulting a physiotherapist compared with a doctor:**

Heterogeneous patient fulfillment results (explained in Table 1) were reported in eight research studies. There was no considerable distinction in complete satisfaction with the physio therapist and the normal doctor groups in 4 studies <sup>[27, 32, 36, 39]</sup>, while fulfillment with the physio therapist was significantly greater in four other studies <sup>[25, 33, 34, 37, 38]</sup> (Table 2). In one study, which found in favor of the physio therapist, the physiotherapist had a substantially longer assessment time with patients <sup>[33]</sup>, possibly confounding this result. No studies reported patient complete satisfaction to be greater with the medical professional than the physiotherapist.

**Resource utilization:**

**Seven studies of moderate to low quality show inconsistent and conflicting changes in healthcare resource utilization from substituting a doctor with a physiotherapist:**

A series of heterogeneous result procedures (explained in Table 1) related to healthcare resource energy were reported in 8 studies. 5 research studies reported the usage rate of 6 resource-related results to be lower when care was provided by physicians, five research studies reported six resource-related outcomes to be lower when care was provided by physiotherapists, and one study reported one resource-related outcome was not considerably different (Table 2). Overall, results show an inconsistent pattern of modification with expert replacement. Some research studies discovered opposing outcomes on different resource-related outcomes for each profession, such as Samsson et al. concluding substitution with a physiotherapist results in substantially less subsequent GP visits however considerably more subsequent physiotherapy appointments <sup>[25, 38]</sup>, and Overmann et al. concluding replacement results in considerably fewer drug suggestions however more physiotherapy referrals <sup>[36]</sup> (Table 2). Specific outcomes were sometimes reported in more than one research study; the variety of physiotherapy recommendations were substantially lower from medical professionals in 2 research studies, the variety of GP appointments lower in two research studies, X-ray requests were considerably higher with physiotherapist in one research study however lower in another study, sick leave significantly lower with a physiotherapist in one study but no various in another, and drug recommendations significantly lower from a physio therapist in 2 studies but considerably greater in another study (Table 2).

**Cost:**

**Substituting a doctor with a physiotherapist may be less costly but there is a lack of evidence as only one study has conducted a health economic analysis:**

Only one study reported a health economic analysis <sup>[32]</sup> After developing no significant difference in health results, a within trial expense reduction analysis found substantially lower direct healthcare facility costs in the physiotherapy group, due to higher wages for orthopedic physicians and considerably less X-ray demands by the physio therapist.

**Care processes:**

**Physiotherapists make similar diagnostic and management decisions to orthopedic surgeons for selected knee hip and shoulder conditions. Substitution may improve access and alter some care processes but the impact of these changes is unclear.**

The findings from six moderate quality inter-rater agreement studies <sup>[26, 29, 30, 33, 35, 37]</sup> (Table 3), show the diagnostic and management decisions of physio therapists to be extremely much like those of orthopedic cosmetic surgeons, for selected shoulder, hip and knee discussions. These outcomes do not necessarily generalize to the full spectrum of musculoskeletal

disorders since research studies frequently utilized participant selection requirements that omitted patients thought likely to be more intricate or in need of surgery. The details of exclusion requirements used to specify each study's picked population are reported in the Population column of Table 1.

In three of the six inter-rater arrangement studies physiotherapists more regularly offered education and suggested exercises than orthopedic cosmetic surgeons<sup>[29, 30, 33]</sup> Two research studies reported the waiting time to see a physio therapist as significantly shorter than for the usual physician<sup>[37, 38]</sup>, and one study reported orthopedic recommendations from a physiotherapist to have greater accuracy (higher surgical conversion rate) than recommendations from basic general practice [38] (Table 2). Due to a lack of synchronized investigation of patient health or cost results alongside these process variables, the impact of these procedure modifications upon patients or health services is unclear.

## DISCUSSION:

This is the very first organized review of professional replacement in the management of musculoskeletal disorders to restrict addition to studies that compared the outcomes of care from doctors with that from a substitute specialist. Despite this requirement we discovered the literature to include methodological drawbacks that weaken the strength and scope of the findings. The professional scope of the treating physiotherapists varied between and within the research studies' native land and moreover the physiotherapists' clinical abilities were not regularly described in detail, making it challenging to attribute the success of professional replacement to a level of scope or know-how. Regardless of the lack of high quality information, it appears likely that physiotherapists offer a safe and reliable service shipment alternative to physicians, however with some cautions that require more investigation. Results recommend that when medical professionals are replaced with physiotherapists, health results are likely to be patient and unchanged fulfillment enhanced or maintained. Yet it is unclear whether there is a net effectiveness gain for health services or society due to conflicting data regarding the allocation of health care resources and limited health financial analysis. The optimum scope and autonomy for physiotherapists is likewise unclear, with respect to the level (if any) of service oversight required by doctors, physio therapist provision of particular activities such as injection and prescribing, and the variety of clinical situations physio therapists ought to handle separately. Up until these evidence spaces are examined even more, service designers will be dependent upon opinion to figure out the optimal responsibilities for physio therapists within modern musculoskeletal services.

Previous evaluations of extended and sophisticated scope physiotherapy have actually likewise observed the low quality of the literature in this field<sup>[11, 12, 42]</sup> Some previous evaluations which have consisted of single-group pre-post and quasi-experimental research studies, reported physiotherapist outcomes to be more favorable than we found, specifying physio therapists provide equal or better effectiveness and use of resources<sup>[11]</sup>, and enhance function, minimize cost and waiting times<sup>[15]</sup> We believe that our review more accurately shows the impact of replacing physicians with physiotherapists, as it is devoid of the influence of observational designs, which may bias interpretation in favor of the replacement expert<sup>[8]</sup>.

This review has highlighted locations for further examination. We advise that future research study should address these with well controlled trials considering the following locations: Firstly, the level of decision-making contract between physiotherapists and physicians needs recognition in populations more representative of the scope of discussions generally seen by the normal medical service. This will clarify the proper autonomy of physiotherapists, and whether possibly inefficient practices such as the review of

recommendations by both medical professionals and physiotherapists are needed, to evaluate specific cases far from physio therapists. Secondly, there seems no substantial distinction in health outcomes when the normal doctor is replaced with a physiotherapist, yet the absence of a significant distinction between groups is not always proof of equivalence<sup>[43]</sup> Future research study might think about equivalence or non-inferiority designs as a better suited method<sup>[44,45]</sup>. There is a lack of research study into the results of important extended-scope practices of prescribing and corticosteroid injection by physiotherapists. We found an unspecified quantity of injections were delivered to unspecified sites by a physio therapist in one research study<sup>[39]</sup>, while another research study referred to injection of corticosteroid and local anesthetic in the physiotherapy group<sup>[32]</sup>. It is uncertain whether physiotherapists gave the injection. Single-group observational case series omitted from this review<sup>[46-48]</sup> have reported safety and clinical enhancement with injection by physio therapists, but comparison with medical professionals is needed to clarify the included worth of physio therapists having wider access to these extended-scope activities. The absence of health financial assessment requires high quality incremental cost and repercussions analyses considering a broad range of health care resources, to establish whether physiotherapists provide a more cost effective option for service companies.

Table 1: Summary of included studies

Study	Type	Country	Clinician	Description	Population	Downs & Black score
<b>Aiken &amp; Harrison et al. 2008 [29]</b>	Inter-rater agreement.	Canada	Orthopedic Consultant, Physiotherapist	Orthopaedic referrals Knee (n=17) Hip(n=22)	Same as Consultant would normally see	15 / 28
<b>Aiken and McColl 2008 [30]</b>	Inter-rater agreement.	Canada	Orthopaedic Consultant, Physiotherapist trained in ordering diagnostic tests	Orthopaedic referrals Knee (n=18) Shoulder (n=6)	Excluded complex referrals and masses	16 / 28
<b>Aiken and Atkinson et al. 2007 [26]</b>	Inter-rater agreement.	Canada	Orthopaedic Consultant, Physiotherapist	Post arthroplasty hip (n=40), knee (n=36) seen by physio and orthopaedic surgeon	Eligibility criteria not described	12/28
<b>Bornhoft et al. 2015 [31]</b>	Retrospective case control	Sweden	General Practitioner, Physiotherapist	Musculoskeletal initially seen by physiotherapist (n=656) or by GP(n=1673) at another clinic	Clinic nurse excluded any patients with concerns of serious pathology	16 / 28
<b>Dakar-White et al. 1999 [32]</b>	Randomised controlled trial	UK	Orthopaedic sub-Consultant, Physiotherapist with extended role	Random allocation to see physiotherapist (n=210) or doctor (n=206) at orthopaedic clinic. Unblinded participants and assessors. Follow up variable (average 5.6 months).	Patients thought to need surgery were excluded	19 / 28
<b>Desmeules et al. 2013 [33]</b>	Inter-rater agreement	Canada	Orthopaedic Consultant, Physiotherapist with advanced practice via a residency program	Orthopaedic referrals for arthroplasty Knee (n=109) Hip (n=11)	Excluded >2 other lower limb pathologies, or surgery in past 6 months	20 / 28
<b>Kennedy et al. 2010 [27]</b>	Cohort	Canada	Orthopaedic clinic doctors, Physiotherapist with advanced practice via a residency program	Consecutive patients saw physiotherapist (n=63) or orthopaedics (n=60) in hip / knee post arthroplasty clinic	Same as Consultant would normally see	15 / 28

#### 4. CONCLUSION

There is an absence of high quality evidence comparing musculoskeletal care delivered by medical professionals, with that from physio therapists serving as replacement for physicians. This review found that 14 moderate to poor quality research studies suggest professional replacement with a physio therapist is safe, results in no significant modification to patient health outcomes and inconsistent variation in the use of health care resources. Physio therapists make similar diagnostic and management decisions to orthopedic surgeons and patients are as, or more satisfied with seeing a physiotherapist, however there is minimal proof (due to a lack of health financial examination) that the lower cost of utilizing a physiotherapist equates into more efficient health services. Further high quality research is required (utilizing patient populations that much better represent the scope of normal medical services), into the health and financial results of expert alternative and particular practices such as prescribing, to clarify the ideal role of physio therapists in modern musculoskeletal services.

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