

Physiotherapy for musculoskeletal conditions: more difficult than rocket science

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Physiotherapy is frequently prescribed to reduce pain and optimize functioning for people with musculoskeletal conditions. In the past 25 years, there has been an increase in studies investigating its efficacy. At the same time, innovative models of management for people with musculoskeletal conditions have been developed. This review speculates as to how the results of these studies might alter physiotherapy management to deliver more appropriate, effective interventions and maximize resource use. It is not intended to be an evidence-based review of these modalities or models of care. Although based on the systems within the UK publicly funded National Health Service, the issues are pertinent in privately funded health systems with finite resources, which face the challenge of providing healthcare for an aging population suffering chronic ill-health.

Musculoskeletal conditions (MSC) are major and increasing causes of pain, disability and healthcare expenditure [1]. What service should be provided and how they are best provided has recently been suggested [2], but at present this ideal is more aspirational than actual. More often, delayed access to healthcare services, poor advice and disjointed service provision exacerbate pain, disability and waste resources. People are frequently referred to physiotherapy for treatment that usually consists of a short course of treatment, after which they are discharged with no follow-up. For chronic, incurable, variable conditions such as MSC, this management is not ideal.

This review highlights the most effective physiotherapy modalities for people with MSC, and suggests how recent innovations in healthcare provision for MSC might improve the delivery of more effective physiotherapy to a greater number of people. Although focused on the publicly funded UK National Health Service, the issues are pertinent to other health systems and models of care facing the challenge of providing healthcare for large numbers of people suffering from MSC. This article is not intended to be a review of the efficacy of physiotherapy modalities or the many different (and excellent) alternative models of care. It is speculative and intended to provoke consideration, discussion and debate. It is not based on refutable evidence, nor do we necessarily espouse any of the management modalities described.

Physiotherapy management of chronic musculoskeletal conditions

The primary aims of physiotherapy are pain relief and improved functioning. Several modalities can be used to achieve these aims and usually

a combination of modalities are employed, determined by a therapist's personal preference, past experience of success and each patient's clinical problems.

Exercise is the cornerstone of physiotherapy treatment for MSC. Exercise induces improvements in pain and functioning [3] without exacerbating joint pain, inflammation or disease activity [4]. This might include exercise regimens to improve local muscle function (e.g., quadriceps strengthening or endurance) and/or general fitness conditioning. These local exercises are likely to effect improvements through better muscle sensorimotor function, joint stability and biomechanics [5], while the more general fitness and functioning program may also affect improvements through the beneficial effects exercise has on psychosocial variables (e.g., self-confidence, self-esteem and depression) [6]. However, several problems remain to be resolved.

Can we identify people who will benefit?

Many people who might benefit from exercise do not because they have not been informed about the benefits of exercise or experienced how it can help, hold inappropriate health beliefs or are not motivated to exercise [7]. The first step in encouraging people to exercise requires informing them of the potential benefits and enabling them to experience how exercise can help. However, behavioral change involves more than simply telling people what is good for them. We need to identify and target people at the stage when they are most likely to begin to exercise in order to maximize resource use, effort and time. For those not at this stage we can deploy psychological

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interventions to encourage and motivate people along the pathway to behavioral change. How we do this is unclear.

Who is helped or harmed?

While the vast majority of people benefit from exercise, a minority of people with severe joint pain, damage, instability and/or active inflammation may not [8,9]. Conversely, people with very mild symptoms may not attain sufficient benefits to justify the time and effort exercise interventions require. How to identify these people has not been clarified.

Can we deliver rehabilitation regimens to large numbers of people?

Exercise regimens evaluated in research studies are often complex and prolonged, making them logistically difficult and financially expensive, which limits their clinical practicality. To ensure research can be translated into clinical practice, clinically applicable exercise regimens (i.e., briefer, simpler and cheaper) need to be devised and evaluated.

How do we get people to exercise regularly, 'forever(!)'?

The benefits of exercise are lost when people stop exercising, which usually occurs because current physiotherapy management (i.e., a short course of treatment without follow-up) does not permit remotivation of patients or reinforcement of health messages. Ways to increase adherence to regular exercise in order to sustain its benefits need to be established and are of vital importance.

Many other modalities are used by physiotherapists (e.g., electrotherapy modalities, manual therapy, heat and cold therapy, yoga, T'ai Chi, relaxation techniques and acupuncture) to reduce pain and improve functioning. Unfortunately, the evidence for their efficacy is limited by the paucity and quality of the research. However, these modalities are popular with patients and have powerful placebo effects, which may be valid reasons for their use as an adjunct to other, more effective interventions. Another factor to consider is that some modalities (e.g., electrotherapy, manual therapy and acupuncture) require trained therapists to deliver the intervention, which is costly and limits availability; therefore, they have a limited role in the long-term management of chronic MSC. Others (e.g., exercise, heat-and-cold therapy, yoga, T'ai Chi and relaxation) can be self administered, are relatively safe and cheap, and can be incorporated in self-management programs.

Future research may prove the efficacy of existing physical therapy modalities or regimens or will develop new ones to improve pain management. However, the assumption that pain relief results in spontaneous improvements in functioning is not valid for everyone. To improve functioning people need to be advised and reassured about what they should and should not be doing, and helped to appreciate their capabilities. Future advances in physiotherapy for MSC may involve less content but more in the delivery of exercise therapy to make this more effective, sustain its benefits, improve efficiency and increase the 'reach' of physiotherapy so that more people benefit.

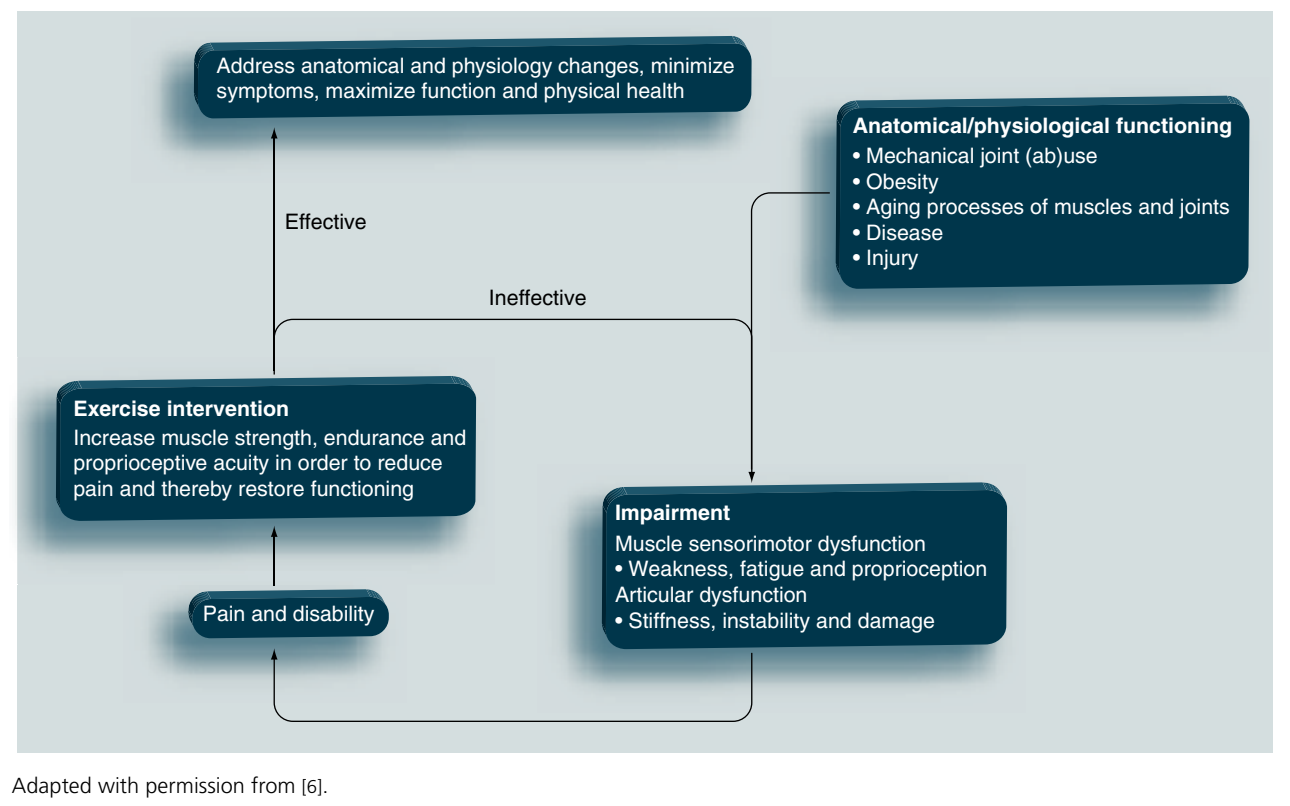
'Unhealthy' models of ill-health

A significant barrier to improving the management of MSC is the model of ill-health, on which management of these conditions is based. The biomedical model of ill-health posits that pathology or injury impairs normal anatomical or physiological function, giving rise to pain and disability, and that correcting these abnormalities will remove the impairment and relieve pain (Figure 1). Existing service provision for MSC is grounded in the biomedical model and centers around a doctor–doctor axis of care – primary care physicians refer patients to hospital consultants for diagnosis and intervention (usually pharmacological or surgical) to cure the underlying pathology.

Benign MSC (e.g., osteoarthritis, knee, hip, shoulder, neck and back pain) are regarded as wear-and-tear conditions that are the inevitable, untreatable consequences of life and aging. As these are not fatal, people are expected to endure them and they are a low healthcare priority – except in the working population because of the economic consequences. Each acute exacerbation of the chronic problem is treated as a new episode with little regard for the long-term management and planning of patient care. They are usually managed with analgesia by primary-care physicians until the pain and disabilities become so great that the patients are referred for a surgical opinion [10,11].

Inflammatory MSC (e.g., rheumatoid arthritis and ankylosing spondylitis) are managed more proactively, usually by hospital consultants. Although the need for in-patient care has declined, regular monitoring of clinical indicators of disease is still considered essential. This encourages long-term dependency on secondary care services, which can result in lengthy delays in diagnosis, intervention and fragmented care.

Figure 1. The biomedical model of ill health with relevance to muscle changes and exercise-based for people with musculoskeletal conditions.



Surgery fits well into the biomedical model of ill-health since it is seen to cure the pathology by excising damaged or inflamed tissues and restoring the biomechanics. Although primary joint replacement is one of the most effective interventions, the demand for primary arthroplasty and high revision rates are placing huge and increasing demands on resources. It is unlikely that the demand for surgery can be met. Moreover, surgery is not a panacea for MSC and a sizeable number of patients have a poor surgical outcome, while many others do not want surgery or have comorbidities that contraindicate surgery.

Unfortunately, the biomedical model is too simplistic. In many instances diagnosis is often difficult (when does chronic joint pain become osteoarthritis?) or impossible (back pain is a symptom not a diagnosis). Often there is no way of eradicating the underlying cause, so there is no cure and treatment must aim at relieving symptoms. In addition, the model cannot explain why some people with comparatively poor health understate their problems, while others in comparatively good health overstate their problems, or why some people derive

considerable benefit from an intervention whilst others obtain little or no benefit. Similarly, it does not explain the well-documented disparity between severity of radiological changes and pain – people with severe radiological damage may complain of little or no pain, while others in severe pain may have few radiological changes. Furthermore, management based on the biomedical model ‘medicalizes’ health problems and concretizes the doctor–doctor axis, forcing people to rely on others for help. For chronic, incurable conditions, this creates enormous problems and demands.

The ‘biopsychosocial model’ considers ill-health to be a complex interaction of the physiological, psychological and socioeconomic sequelae of health problems [12,13]. It accepts that there is a biological cause of ill-health, but places great importance on the influence of people’s health beliefs, experiences, emotions, relationships, social networks and the external environment on their reaction to ill-health and subsequent behavior. Rather than ‘curing’ the underlying pathology, this model emphasizes the role that people’s appraisal and coping skills play in adjustment to living with the consequences of

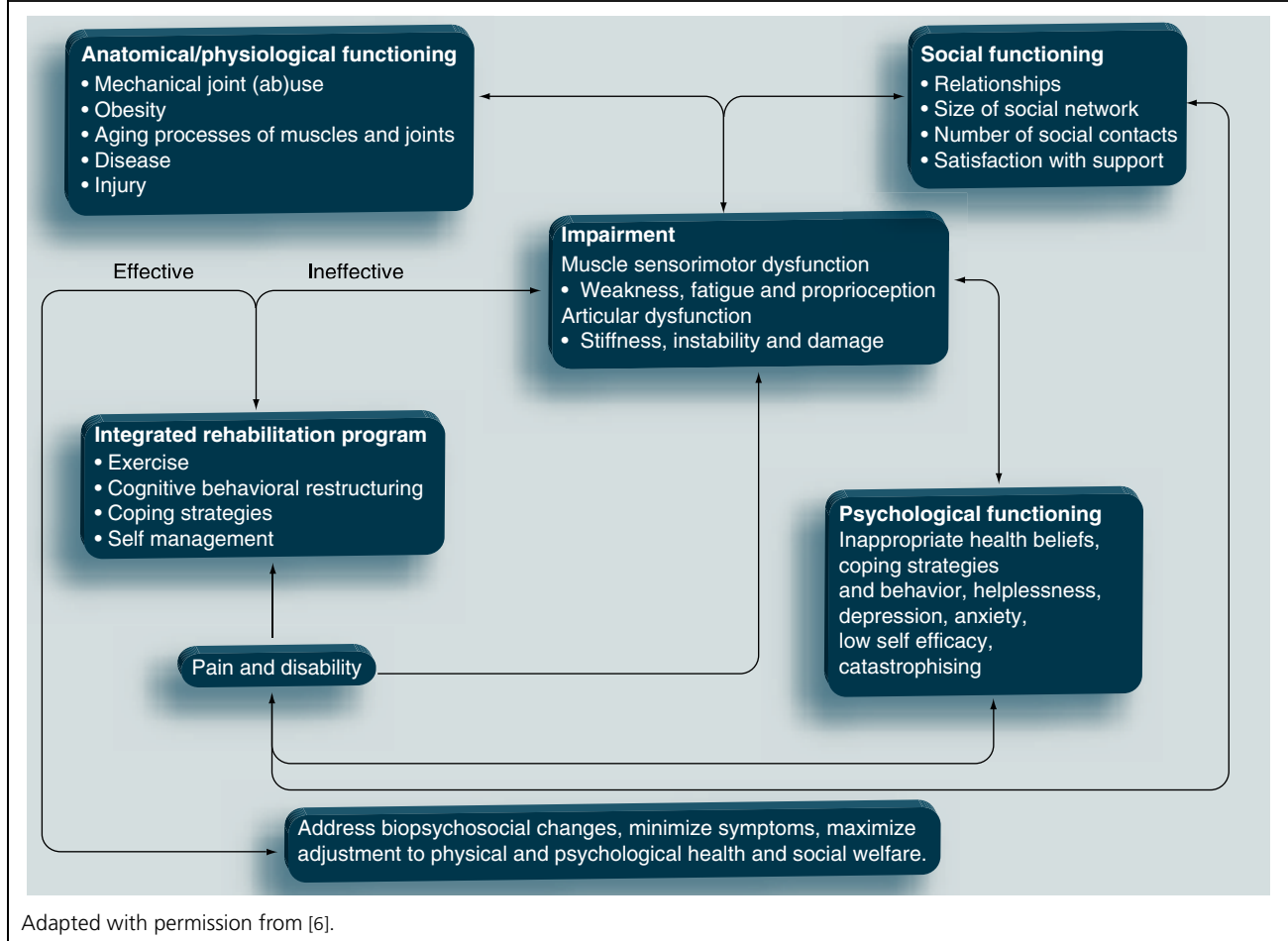
ill-health. The disparities between objective clinical features of ill-health and subjective consequences (e.g., pain and disability) and the comparative success/failure derived from treatment can be explained because the biopsychosocial model recognizes that everyone has different internal traits and external influences that affect their perceptions, beliefs and behaviors.

The biopsychosocial approach also manages ill-health differently [14–16]. Like the biomedical model, it makes a diagnosis (if possible) and requires the provision of prompt, appropriate treatment, but it places great importance on the influence of social and psychological functioning (Figure 2). In addition, interventions based on the biopsychosocial model emphasize the importance of providing information and advice, promoting self-management and independence, and addresses unhelpful health beliefs and behaviors, such as ‘fear avoidance’ and ‘catastrophizing’. Fear-avoidance behaviors arise from erroneous

health beliefs about the inter-relationship between pain, injury and physical activity. People often equate the body to a machine and rationalize that if the life of a mechanical joint can be prolonged by using it less, using their joints less will prolong the life of their joint, so they refrain from their normal activities. They also associate activities (particularly weight-bearing activities) with the onset and increase of pain, surmise that this is a sign that they are damaging their joints and refrain from activity. In fact, disuse is detrimental to human joints, resulting in muscle, bone and cartilage atrophy. Unfortunately, current management (based on the biomedical model) does not challenge these inappropriate health beliefs, so people curtail their usual activities with the consequent problems of disuse atrophy.

Self-management programs use the premise of the biopsychosocial model to develop people’s understanding of their problems and provides

Figure 2. Biopsychosocial model of ill health with relevance to muscle changes and exercise-based for people with musculoskeletal conditions.



Adapted with permission from [6].

them with the skills required to manage their problems themselves, with the assumption that the application of this knowledge and these skills will produce sustained improvements [17–20]. The Arthritis Self-Management Program has been shown to improve pain, functioning, adoption of appropriate health behaviors and reduce healthcare costs [21].

It has been argued that self-management interventions that do not include a significant exercise component are of limited value [22], but that integrated rehabilitation programs might enhance the separate benefits of exercise and self-management [23]. However, if these produce complex, unworkable programs that cannot be delivered to the large population of people with MSC, few people will benefit; the programs produced need to be safe, effective, practicable and affordable [24,25]. A recent rehabilitation program that integrates an exercise regimen with simple coping and self-management strategies was designed to be clinically practicable in that it was relatively brief, did not require specialized equipment or facilities and was delivered by a therapist with little extra training, rather than a multidisciplinary team [26,101]. Although the largest improvements in functioning and pain were evident immediately after completing the program, meaningful improvements were sustained for 6 months after completion of the program [26], and relatively cheaply [27]. Preliminary results of long-term follow-up in this cohort suggest that without further encouragement and reinforcement of the health messages, people's motivation to exercise wanes, participation in regular exercise decreases and the initial benefits are lost. The current challenge is to find ways of increasing adherence to regular exercise in order to sustain short-term benefits. One way of doing this is to improve the management of MSC.

Innovative management of MSC

While chronic MSC are very disabling and costly, they are medically underwhelming – people rarely die from them so they receive low health priority – and numerically overwhelming – they are amongst the most prevalent health conditions [1]. This makes it easy and convenient to ignore the problem. However, the personal suffering and socioeconomic costs of MSC are becoming apparent [28], and innovative ways of providing better care for the growing number of people with these complex, chronic health problems are being devised.

Telephone helplines are the easiest way of helping many people access appropriate information when they need it. In the UK, NHS Direct is a national helpline that advises for any type of health problem, while the Arthritis Care Helpline was established to provide advice and information related to all aspects of MSC (including condition, drug information, understanding symptoms, blood results, diagnosis and appointment queries). Physio Direct is a helpline established to improve access to physiotherapy advice. Here, physiotherapists triage people over the telephone and give verbal and written advice on self-management, over-the-counter medication and can request a prescription from the primary care physician without the need for consultation, or organize physiotherapy. In a pilot study, two-thirds of calls were effectively managed on the telephone and, as a consequence, waiting times for physiotherapy and primary care consultations decreased and missed appointments dropped from 15 to 1% [29]. However, telephone helplines may be suitable as a short-term solution for minor problems and exacerbations, but they are not a substitute for medical care. There is a danger that without a proper assessment, partially informed advice may be improper and/or inadequate. Furthermore, they remove some of the trusting patient–healthcare–professional partnership of working toward agreed goals.

Specialist help in primary care is another way of improving management of MSC. In North Wales, a centralized clinical triage service was set up to manage the overwhelming number of musculoskeletal referrals to orthopedic, pain management, rheumatology and therapy services [30]. Patients with uncomplicated MSC were managed by physiotherapists and primary care physicians with specialist training of MSC in primary care. Patients with more complex needs requiring specialist medical and surgical consultations were referred to the appropriate hospital department. The service resulted in more efficient management and a fall in waiting times, despite a twofold increase in referrals to musculoskeletal services [30].

Based in primary care, multidisciplinary clinical assessment and treatment services are being developed that will bring together health professionals to formulate pathways of care that will improve access to diagnosis, investigations and treatment of MSC [29]. These services will take many forms and develop in response to local needs. They will utilize resources more

efficiently and employ health professionals who are better skilled and have more time to provide better long-term service provision.

Patient-initiated appointments have been shown to be a more efficient way of dealing with people with complicated MSC in secondary care [31]. Rather than having regular appointments determined by the hospital staff, patients initiated review appointments when they considered that they needed to be seen. The initiative cut hospital appointments by almost 40%, without any detrimental effects on patient's health. The patients reported high satisfaction and confidence in the review system [31]. Similar centers have now been set up where people with MSC can self-refer to physiotherapy, bypassing the requirement for primary or secondary care physician referral and reducing costs [32].

Delivering better physiotherapy to more people through innovative management

The innovative management schemes already described improve access to appropriate information and management for many more people. Once in the healthcare system, effective, low-cost, integrated rehabilitation programs can be delivered to large numbers of people, enabling them to appreciate what they can(not) and should (not) be doing themselves, promoting active self-management. The service innovations could also provide continued advice, reassurance, reassessment and remotivation – 'supported self-management'. An effective model of care supporting this premise already exists. The National Ankylosing Spondylitis Society show that such management can work and benefit

large patient populations. They employ health-care professionals to run weekly exercise/hydrotherapy classes for its members, which also provide peer support for the participants. The classes are popular, well attended and effective. Getting larger and older populations of people with more benign MSC to exercise regularly will be more challenging, but not impossible.

The way we currently manage people with MSC, based on a biomedical model obsessed with specific diagnosis and cure, is inappropriate and inefficient, placing unnecessary demands on expensive secondary care. Exercise-based rehabilitation programs reduce pain and improve functioning, and integration into these self-management strategies produces more effective and affordable management options. Physiotherapists are well placed to deliver effective management to people with MSC, as they are regarded as the healthcare professionals most informed and knowledgeable about therapeutic movement and exercise, and are skilled exercise instructors. Innovative management schemes improve access to care and could deliver exercise-based rehabilitation programs to large numbers of people.

Without continued support, people soon stop exercising and short-term improvements are lost. Therefore, the major challenge is to find the best ways of maintaining the improvements derived from exercise therapy. Exercise that improves health is not rocket science; it can consist of simple physical activity and does not require special facilities or supervision. Despite having put men on the moon, getting people to exercise regularly to retain health benefits is proving more difficult.

Executive summary

- Service provision of musculoskeletal conditions (MSC) lacks cohesion, is cumbersome, inefficient and often ineffective.
- This is partly because management is based on the biomedical model of ill-health, which posits that a health professional can identify and cure a pathology.
- The biopsychosocial model recognizes and addresses wider influences on health, promotes self-management and is a better way of managing MSC.
- Physiotherapy-led exercise can improve pain and functioning, without exacerbating pain or disease activity.
- Exercise regimens can be improved by integrating simple coping and self-management strategies.
- Getting people to retain health benefits by participating in regular exercise is very difficult.
- Innovative ways of providing better access to information, advice and treatment have been shown to be capable of delivering more appropriate healthcare and use resources more efficiently.
- These innovative ways of delivering healthcare could deliver safe, effective and affordable integrated rehabilitation programs to large numbers of people.

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