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Providing physical activity interventions for people with musculoskeletal conditions

Authorship and Contributors

This report was produced by Arthritis Research UK in partnership with the Department of Health, NHS England and Public Health England. The lead author is Benjamin Ellis, and the supporting authors are Anna Garratt and Tim Marshall.

We are grateful to all the individuals who reviewed this document and provided comments and case studies. We are also grateful to Nuzhat Ali and Sarah Marsh for leading on the input from Public Health England and NHS England and to Paul Donovan and Jacqui Oliver for proof-reading and referencing support.

This report developed out of an ad hoc group that met between March 2015 and July 2016 to discuss ways of improving musculoskeletal health through physical activity and we are very grateful to Jane Allberry for hosting these meetings at the Department of Health. The forum attendees are listed in the Appendix.

A major source of input was an evidence review programme between April and May 2016 which looked at structured community rehabilitation programmes for musculoskeletal health. The evidence review document and the programme attendees is available on Arthritis Research UK's website. We are very grateful to Professor Phillip Conaghan for chairing the programme panel.

Arthritis Research UK

At Arthritis Research UK, we invest in breakthrough treatments, the best information and vital support for everyone affected by arthritis. We believe that by harnessing the power of exceptional science we can overcome the pain, isolation and fatigue arthritis causes, making everyday life better for all 10 million people with arthritis in the UK.

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Forewords

Chief Medical Officer

Medicine has changed from when we used to recommend rest for back and joint problems. Many people believe the myth that those with arthritis should not exercise. Evidence now, however, tells us the reality is that at the right level, exercise can ease stiffness, and improve joint movement. Being active also helps to reduce pain, restores mobility and preserves musculoskeletal health.

I have previously referred to musculoskeletal conditions as an unrecognised public health problem. More recently in my annual report, *Baby Boomers: Fit for the Future*, I set out how people aged 50 to 70 can benefit from being physically active and be healthier and fit for the future. Arthritis and musculoskeletal problems are a very

common part of multi-morbidity, and pain can prevent people from being active. With an ageing population and rising obesity, to meet this need only with more and more medicine will neither be possible nor desirable.

This document builds on the UK CMOs' physical activity recommendations which identified the benefits of the right level of exercise for people with musculoskeletal conditions. It is about supporting people to improve their own health, particularly through physical activity and have a better quality of life. These conditions need to be addressed so people can realise the considerable benefits of physical activity for their own health – both short and long term.

Professor Dame Sally Davies
Chief Medical Officer

Public Health England

Musculoskeletal conditions affect over 10 million people nationally and are a major cause of pain, deterioration in mental health and disability in the UK and globally. Increasingly we are seeing new threats to the health of the public that are mostly due to unhealthy lifestyles and contribute to the cause of musculoskeletal conditions, diabetes and heart disease. Our ageing population, rising obesity rates and reduced level of physical activity will increase the prevalence of these conditions.

For many years there has been a perception that arthritis and back pain are unavoidable and part of the ageing process and the focus has been on conventional treatments to alleviate pain and

discomfort. The increasing cost to the health and social care system requires a change in how we view musculoskeletal conditions with a focus on prevention, early detection and treatment using the life course whole systems approach.

Public Health England welcomes this report, which highlights the outputs of programmes that have been achieved through excellent collaboration between Arthritis Research UK, NHS England, the Department of Health and other partners. The case studies demonstrate how the interventions are effective across care pathways, cost effective and provide long term health benefits for individuals across the life course.

Professor Kevin Fenton
National Director of Health and Wellbeing
Public Health England.

NHS England

The recognition of the scale of musculoskeletal conditions has increased significantly, with conditions such as osteoarthritis and back pain being the greatest cause of pain and disability in the UK and worldwide – affecting over 10 million people nationally.

With musculoskeletal conditions highlighted as a service improvement area for NHS England, a programme is underway in partnership with the Arthritis and Musculoskeletal Alliance focusing on the development of musculoskeletal knowledge networks. These will support the delivery of patient centred care with a focus on improved outcomes, prevention, self-management, resilience and inclusion in society. The partnership aims to transform the musculoskeletal workforce, deliver better support and services and develop and use a range of practical and useful measures and metrics. One example is how physical activity can benefit those affected by these conditions.

This report shows, through collaborative working between NHS England, Public Health England, Department of Health and Arthritis Research UK, how we can continue to embed these elements throughout the musculoskeletal pathway, support service development and highlight the importance of keeping people healthier for longer, maximising their ability to lead fulfilling

lives, to be independent and to be in work as much as possible. The report addresses not just the physical but also the psychosocial needs of individuals, their carers and the benefits to society as a whole.

It has been developed specifically to support organisations responsible for commissioning and providing local services, although other musculoskeletal and physical activity organisations may also find it of interest. Focusing predominantly on osteoarthritis and back pain, at the heart of the document is a framework for the types of physical activity provision that are needed to meet the needs of people with musculoskeletal conditions. This is supported by an evidence base of the benefits of physical activity and case studies. What commissioners and providers may also find helpful is a checklist to support mapping of local physical activity provision, for people with painful musculoskeletal conditions, allowing potential gaps to be identified.

I hope you find this document supportive and informative in continuing to help improve outcomes for those people with musculoskeletal conditions.

Professor Peter Kay
National Clinical Director for Musculoskeletal
Conditions
NHS England

Arthritis Research UK

The impact of musculoskeletal conditions on the individual and society cannot be underestimated. People with arthritis live with pain, disability and fatigue, which can affect every aspect of their lives, from their independence to their ability to stay in work, their mental health and self-esteem. The NHS spends over £5 billion annually in treating and supporting people with musculoskeletal conditions, they are the biggest cause of working days lost and one in five people sees their GP each year about a musculoskeletal problem. As society ages, and people live longer with multiple long-term conditions, the impact of arthritis is only going to increase.

Our vision is to create a world free from the impact of arthritis. At the core of our approach, is promoting physical activity. Research shows for people with musculoskeletal condition, engaging in appropriate physical activity reduces pain, improves quality of life and strengthens the muscles and joints. It is one of the best things that we can do to maintain good musculoskeletal health.

But for many people with joint or back pain, becoming physically active is not straightforward. They often are unaware that physical activity can benefit their symptoms. Health and fitness professionals can lack the knowledge and skills to promote physical activity or to provide reassurance and tailored advice.

In this report, we recognise that there is no single approach to supporting physical activity. Many people can benefit from self-directed physical activity using accessible community facilities that are welcoming of, and equipped for, the needs of people with musculoskeletal conditions. Some will need individualised, hands-on support with prescribed exercises from physiotherapy.

We also emphasise the role of structured community rehabilitation programmes such as ESCAPE-pain. These brief, evidence-based programmes produce long-lasting symptom reduction, and are an important route into effective self-management for people with arthritis. Although similar programmes are now widely available for other health conditions – such as cardiac rehabilitation or pulmonary rehabilitation, health systems have not yet invested in these for people with arthritis. This needs to change.

In 2014 we published our report, Musculoskeletal Health: a public health approach to emphasise the need for a life-course approach to treating musculoskeletal conditions. We made it clear that public health systems must not ignore their essential role in supporting healthier environments and behaviour change. This publication directly builds upon our earlier work. Public health systems have often overlooked the needs of people with musculoskeletal conditions and frequently underestimate the benefits of physical activity for this population. This is not only inequitable, but deprives large numbers of people of the opportunity to enjoy better musculoskeletal health.

In order to embed a physical exercise approach and achieve good, life-long musculoskeletal health for people across the UK, we need to work in partnership. This report is an example of this in practice. In working with Public Health England, NHS England, the Department of Health and others we have created a landmark report which recognises both the benefits of physical activity for people with musculoskeletal conditions, and also the role that these bodies can play in supporting and delivering this approach across public health.

Dr Liam O'Toole
Chief Executive
Arthritis Research UK

Summary

‘Providing physical activity interventions for people with musculoskeletal conditions’ is intended for organisations responsible for commissioning and providing local services, as well as musculoskeletal and physical activity organisations who may find it of interest.

It has been jointly produced by Arthritis Research UK, NHS England, Public Health England and the Department of Health, and aims to:

- summarise the evidence of the benefits of physical activity for people living with musculoskeletal conditions;
- present a framework (the Arthritis Research UK musculoskeletal physical activity commissioning pyramid) for local physical activity provision to meet the needs of people with these conditions;
- support the mapping of local physical activity provision (via a checklist) for people with arthritis and musculoskeletal conditions, allowing identification of potential gaps;
- provide case studies of how programmes, services or schemes have been developed to support people with musculoskeletal conditions to be physically active.

For more information about the Arthritis Research UK musculoskeletal physical activity commissioning pyramid please see Section 3

1: Introduction and policy context

1.1 Introduction

Musculoskeletal conditions, such as osteoarthritis and back pain, are the greatest cause of pain and disability in the UK.¹ In 2015 musculoskeletal conditions were the main reason for sickness absence in the UK with 32.4 million working days lost.²

Many people with arthritis and musculoskeletal conditions can reduce their pain and improve their quality of life and independence by becoming more physically active.

Physical activity can benefit those affected by musculoskeletal conditions, as well as their families and carers, and also the wider economy. Those who participate will rely less on health and care services and remain able to continue to participate in the workplace.

The benefits of physical activity for people with musculoskeletal conditions have not been fully realised. This is partly because the benefits are insufficiently known; there is a common myth that people with these conditions should rest, and that activity will further damage their joints. Also, because of their pain, people with musculoskeletal conditions can find it difficult to be physically active. People living with pain and disability need additional support to become and remain physically active so they can enjoy the benefits.

Because of the large numbers affected, the focus of this document is to promote physical activity as an effective, safe and cost-effective treatment approach for people with existing musculoskeletal conditions, such as osteoarthritis and back pain. Included in this document is the outcome of a detailed evidence review of structured community rehabilitation programmes for people with osteoarthritis (section 5). The review found no such suitable programmes for back pain.

This document also considers the benefits of physical activity for those affected by systemic inflammatory conditions such as rheumatoid arthritis and ankylosing spondylitis. Likewise,

people at risk of falls and fragility fractures may also benefit from physical activity-based interventions. This document will reference existing resources where these have been extensively discussed.

People with musculoskeletal conditions may also benefit from a range of clinical interventions and support alongside and beyond physical activity. These are beyond the scope of this document, and the relevant National Institute for Health and Care Excellence (NICE) guidance is cited.

Finally, primary prevention is outside the scope of the framework presented here, though there is indeed some evidence that increased physical activity has a role in preventing the onset of painful musculoskeletal conditions.

This document therefore aims to:

- summarise the evidence of the benefits of physical activity for people living with musculoskeletal conditions;
- present a framework for local physical activity provision to meet the needs of people with these conditions;
- support the mapping of local physical activity provision (via a checklist) for people with arthritis and musculoskeletal conditions, allowing identification of potential gaps;
- provide case studies of how programmes, services, or schemes have been developed to support people with painful musculoskeletal conditions to become physically active.

1.2 Overview of musculoskeletal health

Good musculoskeletal health – muscles, joints and bones working well together without pain – enables people to live independently and carry out their daily activities without pain and discomfort. Poor musculoskeletal health can be due to a large number of conditions that affect the bones, joints, muscles, ligaments and tendons.³

Large numbers of people live with musculoskeletal conditions:

- Over 10 million people live with the devastating pain of a musculoskeletal condition across the UK. Painful musculoskeletal conditions are now the largest single cause of years lived with disability (YLDs) and the third-largest cause of disability adjusted life years (DALYs).⁴
- A third of people over 45 years of age across the UK (8.75 million people) have sought treatment for osteoarthritis, the most common form of arthritis.⁵
- 1 in 5 adults over 45 years of age in England have knee osteoarthritis and 1 in 9 adults have osteoarthritis of the hip.⁶
- Around 9 million people in England have persistent back pain; of which 5.48 million experience severe back pain.⁷
- Over 400,000 adults in the UK have rheumatoid arthritis.⁸
- More than 98,211 hip replacement procedures and 104,695 knee replacements were undertaken within the NHS in 2015 alone.⁹
- The National Hip Fracture Database estimates 64,102 people presented with a hip fracture in 2014.¹⁰
- 14,000 people die each year following a hip fracture in the UK.¹¹

There are three broad groups of musculoskeletal conditions (Figure 1):

- The first group is made up of inflammatory conditions such as rheumatoid arthritis and ankylosing spondylitis. In these conditions the immune system attacks and destroys the joints causing pain and disability, and sometimes attacks the internal organs. These conditions require specialist care from rheumatologists using drug treatments to suppress the immune system to stop inflammation and damage.
- The second group includes conditions of musculoskeletal pain such as osteoarthritis and back pain. In osteoarthritis there is painful wear and degeneration of joints. They affect large numbers of people and management usually involves prescription of specific therapeutic exercise by a trained clinician, physical activity, weight loss and pain management. People with these conditions are usually treated in primary or community settings, often by general practitioners and physiotherapists. People with severe osteoarthritis may need joint replacement surgery to relieve pain and restore mobility.
- The third group is osteoporosis and fragility fractures. Osteoporosis is a painless condition of bone weakening. Fragility fractures occur when weak bones (often caused by osteoporosis) break, often after a trip or fall from a standing height. Fragility fractures affect large numbers of people causing pain and disability. Treatment of people at risk of fragility fractures usually takes place in primary care, and can include bone strengthening medication. Broken bones can require surgical treatment in hospital.
- Musculoskeletal conditions are expected to become more common as the population ages.

Figure 1: Three groups of musculoskeletal conditions

Group	Inflammatory conditions	Conditions of musculoskeletal pain	Osteoporosis and fragile fractures
Example	Rheumatoid arthritis	Osteoarthritis, back pain	Fracture after a fall from a standing height ⁱ
Age	Any	More common with rising age	Mainly affects older people
Progression	Often rapid onset	Gradual onset	Osteoporosis is a gradual weakening of bone. Fragility fractures are sudden discrete events
Prevalence	Common (e.g. around 400,000 adults in the UK have rheumatoid arthritis)	Very common (e.g. 8.75 million people in the UK have sought treatment for osteoarthritis)	Common (e.g. around 89,000 hip fragility fractures occur each year in the UK)
Symptoms	Common musculoskeletal symptoms include pain, joint stiffness and limitation of movement. Symptoms often fluctuate in severity over time		Osteoporosis itself is painless. Fragility fractures are painful and disabling
Extent of disease	Can affect any part of the body including skin, eyes and internal organs	Affects the joints, spine and pain system	Hip, wrist and spinal bones are the most common sites of fractures
Main treatment location	Urgent specialist treatment is needed, and usually provided in hospital outpatients	Primary/community care for most people; joint replacement requires hospital admission	Primary care for prevention. Hospital for treatment of fractures
Medical treatment	Medication to suppress the immune system	Pain management support to maintain healthy body weight; for severe cases joint replacement may be necessary	Bone strengthening drugs. Fractures may require surgery
Physical activity benefits and rehabilitation	Generic, self-determined and prescribed exercises are an important adjunct to medical therapy	Generic, self-determined and prescribed exercises are the core treatment approach	Generic, self-determined and prescribed exercises prevent falls, strengthen bone and enhance recovery after a fracture
Modification risk factors ⁱⁱ	Smoking	Injury, obesity, physical inactivity	Smoking, alcohol intake, poor nutrition including insufficient vitamin D, physical inactivity

ⁱ Osteoporosis is a condition of bone weakening which is painless. Fragility fractures caused by osteoporosis happen when frail bones break, causing pain and disability. More generally, bone fractures can be due to trauma or injury.

ⁱⁱ Non-modifiable risk factors include age, sex and genetics.

1.3 Physical activity overview

Physical activity can include ‘all forms of activity, such as everyday walking or cycling, ... active play, work-related activity, active recreation such as working out in a gym, dancing, gardening or playing active games, as well as organised and competitive sport’.¹²

It can be classified into intensity levels which directly translate into an energy expenditure.¹³ Physical activity intensity can be subject to the amount of effort invested, as well as the physical fitness of an individual. Most activities which include an aerobic or cardiovascular component are classified into a higher intensity level, such as moderate or vigorous. These activities typically increase heart rate and breathing, as well as induce sweating. In addition, physical activity can be quantified in terms of frequency (the number of times an individual engages in activity over a given time period, such as a week) and duration (the amount of time spent in any given activity per episode, such as 10 or 30 minutes).

Regular physical activity that meets national guidelines (Figure 2) has considerable general health advantages for the individual, for families, communities and society – it has health benefits, improves sleep, maintains healthy weight, manages stress and improves quality of life. It also reduces the chances of developing a range of conditions ranging from Type II diabetes by 40%, colon and breast cancer by 20% and joint and back pain by 25%.¹⁴ The risk of developing cardiovascular disease, falls, depression, anxiety and dementia are also reduced (Figure 2).

Physical activity-based interventions can also improve symptoms of people with all musculoskeletal conditions. This can be as a core treatment (for example in osteoarthritis or back pain), or as an adjunct to drug treatments (for example in rheumatoid arthritis). Depending on clinical and individual need, physical activity can comprise a spectrum of approaches from general, self-determined activities (such as walking or swimming) to specific, therapeutic exercises prescribed by a health professional such as a physiotherapist.

1.4 Policy context

NICE recommends physical activity as part of the prevention and treatment pathway for chronic conditions including back pain, osteoarthritis and prevention of falls (Section 1.5). All practitioners should identify opportunities to initiate discussions around physical activity as part of the assessment and treatment of a patient, forming a routine part of clinical care.¹⁵

To maintain good physical and mental health, the UK Chief Medical Officers’ Guidelines (2011)¹⁶ recommend 75 minutes per week of vigorous intensity activity or 150 minutes per week of moderate intensity activity or a combination of both. To keep muscles, bones and joints strong and reduce the chance of falls among those at risk, physical activity to build strength and improve balance twice weekly is also recommended.

The Chief Medical Officers’ report ‘Start Active, Stay Active’¹² highlights that the strength of the relationship between physical activity and health outcomes persists throughout people’s lives, highlighting the potential health gains that could be achieved if more people become more active throughout the life course.

1.5 NICE guidance

NICE has published pathways on physical activity, as well as condition specific guidelines on osteoarthritis and low back pain. Key documents include:

- The NICE guidance ‘Physical activity: exercise referral schemes’,¹⁷ includes recommendations that cover policies and strategies to help improve the physical environment to support physical activities, as well as travel. NICE recognises the role that physical activity can play in helping to prevent and manage more than 20 different conditions or diseases, including musculoskeletal conditions. In addition, physical activity can promote mental wellbeing; people with long-term health conditions in particular may feel anxious or depressed.
- The guidance also includes a focus on exercise referral schemes which try to increase physical activity among people who are inactive and are otherwise healthy, or who have any

Figure 2:

Physical activity benefits for adults and older adults

-  BENEFITS HEALTH
-  IMPROVES SLEEP
-  MAINTAINS HEALTHY WEIGHT
-  MANAGES STRESS
-  IMPROVES QUALITY OF LIFE

REDUCES YOUR CHANCE OF


Type II Diabetes	-40%
Cardiovascular Disease	-35%
Falls, Depression and Demementia	-30%
Joint and Back Pain	-25%
Cancers (Colon and Breast)	-20%


What should you do?


For a healthy heart and mind

Be Active


VIGOROUS



RUN



SPORT


STAIRS

MODERATE



WALK



CYCLE



SWIM

To keep your muscles, bones and joints strong

Sit Less


TV



SOFA



COMPUTER


BREAK UP SITTING TIME

To reduce your chance of falls


Build Strength



GYM



YOGA


CARRY BAGS

Improve Balance


DANCE


TAI CHI


BOWLS

2 DAYS PER WEEK

MINUTES PER WEEK

75 **OR** 150

VIGOROUS INTENSITY

(BREATHING FAST
DIFFICULTY TALKING)

MODERATE INTENSITY

(INCREASED BREATHING
ABLE TO TALK)

OR A COMBINATION OF BOTH

Something is better than nothing.

Start small and build up gradually: just 10 minutes at a time provides benefit.

MAKE A START TODAY: it's never too late!

UK Chief Medical Officers' Guidelines 2011 **Start Active, Stay Active**

existing health condition or other risk factors for disease. It does not include structured exercise programmes designed for managing a specific health condition or for rehabilitation following recovery from a specific condition. This includes cancer, cardiac or pulmonary rehabilitation programmes.¹⁷

- The NICE clinical guideline on low back pain in adults recommends as a priority that clinicians ‘advise ... that staying physically active is likely to be beneficial’ and should consider offering a structured exercise programme tailored to the individual.¹⁸ The guideline has recently been updated.¹⁹
- The NICE clinical guideline on osteoarthritis: care and management advises people with osteoarthritis to exercise as a core treatment irrespective of age, comorbidity, pain severity or disability.²⁰

1.6 Focus: Conditions of musculoskeletal pain and physical activity

Osteoarthritis and low back pain are important in this context because of their high prevalence, marked negative impact of quality of life for those affected, and the substantial potential to address both prevalence and impact through appropriate physical activity.

Osteoarthritis

Osteoarthritis is the painful wear and degeneration of joints. Healthy joints move painlessly due to an even layer of smooth cartilage coating the ends of bones. In osteoarthritis, this cartilage becomes thinned

and pitted and can even wear away completely. Around a third of people aged 45 years and over in the UK, a total of 8.75 million people, have sought treatment for osteoarthritis.⁵ Nearly three-quarters of people with osteoarthritis report some form of constant pain, with one in eight describing their pain as often unbearable.²¹ Osteoarthritis can affect any joint, especially following an injury. The most commonly affected joints are knees, hips, neck and back, the big toe and hands.⁵

Back pain

Back pain affects around one-third of the UK adult population each year, with one in five of the population consulting their GP about low back pain each year.¹⁸ Symptoms typically include pain and stiffness, with reduction in movement. For many people, back pain can be recurrent or persistent (sometimes called ‘chronic’), with pain lasting on and off for several weeks, months or even years.²² Low back pain is the largest single cause of disability adjusted life years, and the largest single cause of years lived with disability in England.⁴ UK specific data shows that low back pain was the top cause of years lived with disability in both 1990 and 2010, with a 12% increase over this time.⁴

Physical activity benefits for osteoarthritis and back pain

Evidence for the role of physical activity in the primary prevention of conditions of musculoskeletal pain is limited, but a number of studies have demonstrated its benefit, for example:

- Walking 6,000 steps per day protects against disability in people with or at risk of knee osteoarthritis.²⁶

Back pain

Back pain is very common, and is usually caused by a simple muscular strain: it affects 4 out of 5 of us at some point in a lifetime. Around 9 million people in England have back pain, of which 5.48 million report the pain as severe.⁷ Low back pain is a leading cause of years lived with disability worldwide^{23,24} and in the UK around 20% of people with low back pain consult their GP each year.²⁵ Fortunately most periods of back pain settle within a few weeks with primary care treatments such as reassurance, advice to continue with normal activities as soon as possible, doing appropriate exercise and taking painkillers. In more severe cases, physiotherapy, occupational therapy, additional medication or surgery may be helpful.

- Older people who were physically active and those who became physically active (having not previously been) aged better. In terms of musculoskeletal health, the physically active were around one third less likely to have impaired walking or their daily living activities restricted.²⁷
- Moderate intensity physical activity has disease specific benefits in terms of pain, function, quality of life and mental health.²⁸

There is a much stronger evidence base for physical activity as secondary or tertiary prevention – as a treatment – for people with arthritis. Physical activity can help reduce musculoskeletal pain, as well as improve the range of movement and joint mobility, increase muscle strength, reduce stiffness and boost energy.²⁹ Physical activity is therefore one of the most important treatments for conditions such as osteoarthritis and back pain, ideally combining strengthening exercises for muscles, to support joints, as well as for general fitness.³⁰

For example, appropriate exercise can reduce symptoms in osteoarthritis of the hip and knee³¹ and reduce the risk of recurrence of back pain by about 25%.³² Walking is recommended as an effective form of exercise or activity for individuals with chronic musculoskeletal pain.³³ Many different types of exercise have been shown to be beneficial, including swimming, walking, cycling and running. Studies have shown that it is a myth that recreational running causes osteoarthritis.³⁴

A number of plausible biological mechanisms have been demonstrated for these benefits. These include better nutrition and structure of cartilage, and improved strength of the muscles surrounding joints providing stability and reducing damage.³⁵

Many people with musculoskeletal conditions such as osteoarthritis and back pain struggle to become more physically active because of their pain, even though in the medium- to long-term physical activity will reduce their pain and improve their musculoskeletal health. Behavioural and environmental strategies are therefore needed to support people with musculoskeletal conditions to become more physically active and to maintain higher levels of activity.

1.7 Focus: Inflammatory conditions and physical activity

Two of the commonest inflammatory conditions are rheumatoid arthritis and ankylosing spondylitis. These are both conditions where the immune system attacks the body's own tissues, including the joints, causing painful inflammation and damage.

Rheumatoid arthritis affects more than 400,000 people in England.⁸ Three out of ten of those who develop this severe, painful, disabling condition are not working within five years of onset.³⁶ People can be affected at any age, and usually need lifelong specialist treatment with powerful medication to suppress the immune system.

Around 200,000 people in the UK are thought to have ankylosing spondylitis.³⁷ Typically people develop this lifelong, progressive condition at a young age. Here, the immune system particularly targets the joints of the spine, causing stiffness and pain in the neck and back. Although some people with mild ankylosing spondylitis do not require drug treatments, others benefit from immunosuppressant drugs under specialist care.

Physical activity benefits for inflammatory conditions

Exercise has been shown to improve physical function, disease activity and cardiovascular health in people with rheumatoid arthritis.³⁸ However, most people living with this condition are sedentary; incorrect beliefs that exercise can be harmful are common among both health professionals and people with the condition. Multiple studies have now shown the benefits of high-intensity aerobic and resistance exercise to people with rheumatoid arthritis.³⁹

For people with ankylosing spondylitis, physical activity interventions focusing on flexibility improve physical function and disease activity as well as pain, stiffness and spinal mobility.⁴⁰ Supervised group exercise yields better outcomes than unsupervised home exercise. There appears to be a hierarchy of physical activity interventions, with individual home-based or supervised exercise programmes better than no intervention; supervised group physiotherapy better than home exercises; and combined inpatient spa-exercise therapy followed by group physiotherapy better than group physiotherapy alone.⁴¹

1.8 Focus: Falls, fractures and physical activity

Falls and fractures

People who have osteoporosis (weakening of the bones with rising age) are at risk of fragility fractures. This happens when frail bones break, sometimes after a minor trip or fall (including from a standing height). Falls are a common and serious health issue facing older people, with one third of those over 65 years of age and half of those aged over 80 years falling annually.⁴² 5% of community dwelling adults with a history of falling experience fractures and hospitalisation.⁴³ Fractures are common in older people – for those aged 50 and over around 1 in 2 women and 1 in 5 men break a bone⁴⁴ and require hospital treatment including surgery. Long-term pain, loss of mobility and independence, social isolation and depression are common.

Physical activity benefits for falls and fractures

Certain exercise programmes, in particular those focusing on individualised and progressive gait, strength and balance retraining, have been shown to reduce the rate of falls by approximately 25%. The NICE clinical guideline for falls⁴² (CG161) recommends muscle strengthening and balance programmes as a falls prevention intervention. They state that older people living in the community with a history of recurrent falls and/or balance and gait deficit are most likely to benefit from this. Evidence based falls prevention programmes include FaME and Otago.⁴⁵ The UK Chief Medical Officers recommend that adults should also undertake physical activity to improve muscle strength on at least two days a week.¹⁶

The National Osteoporosis Society (NOS) has developed a toolkit in conjunction with partners in the NHS to aid the commissioning of services that improve care of people with osteoporosis and fragility fractures. This is available on the NOS website:

<https://nos.org.uk/for-health-professionals/services/fracture-liaison-services/implementation-toolkit/>

1.9 Focus: Multimorbidity, musculoskeletal conditions and physical activity

Multimorbidity and musculoskeletal conditions

Multimorbidity is the experience of living with ‘two or more chronic conditions’.⁴⁶ Musculoskeletal conditions, including osteoarthritis and back pain, are common among people with other long-term conditions. For example, among people over 45 years of age who say they are living with a major long-term condition more than one third also have a painful musculoskeletal condition such as osteoarthritis or back pain.⁴⁷

Musculoskeletal health and mental health are inter-related and influence one another.⁴⁸ Around one in six people with rheumatoid arthritis has depression⁴⁹, and seven in ten people with arthritis report depression when their pain is at its worst.⁵⁰ Poor mental health worsens pain. People with back pain and depression have greater disability than those with back pain alone.⁵¹ Depression in people with rheumatoid arthritis is linked with progressively worsening pain⁵² and overall disability.⁵³

In 2011 the Government published a mental health strategy ‘no health without mental health’.⁵⁴ The Government requires NHS England to work for parity of esteem between mental and physical health, and to close the health gap between people with mental health problems and the population as a whole through the annual NHS Mandate.

Physical activity benefits for multimorbidity and musculoskeletal conditions

Physical activity has benefits for many long-term health conditions, including depression and anxiety. It may therefore be of particular value to people living with multiple long-term conditions, including – and perhaps in particular – where one of these conditions is a painful musculoskeletal condition.

Unless addressed, musculoskeletal pain can be a significant barrier to physical activity. A musculoskeletal condition can be a barrier to physical activity due to pain and restriction of movement. People with musculoskeletal conditions may also have differing levels of 'patient activation'. Patient activation is a measure of a person's skills, confidence and knowledge to manage and cope with their health,⁵⁵ including the motivation to be physically active. People's musculoskeletal needs must be met – and issues such as pain addressed – so they are able to enjoy the health and wellbeing benefits of being physically active.

2: The economic case for physical activity provision

The economic case for the physical activity provision for people with musculoskeletal conditions is built on understanding the impact of poor musculoskeletal health, and considering how these might be reduced through increased uptake of physical activity.

2.1 Impact on individuals

Musculoskeletal conditions are the largest contributor to the burden of disability in the UK, and accounted for 30.5% of years lost due to disability in 2010.⁴ The impact these conditions have on those affected can be substantial and life changing. Many musculoskeletal conditions are long term and cause persistent pain, resulting in a substantial loss of quality of life over decades.

The pain and disability musculoskeletal conditions cause can limit independence and the ability to participate across many aspects of family, social and working life.³ They can compromise people's ability to undertake fundamental activities of daily living, such as dressing, personal hygiene and preparing meals.

The experience of living with pain in itself reduces quality of life. Nearly three-quarters of people with osteoarthritis (the most common type of arthritis) report some form of constant pain, with one in eight describing the pain they experience as 'often unbearable'.²¹

2.2 Health and social care costs

Musculoskeletal conditions now account for the third largest area of NHS spending, with a programme budget of £4.7 billion in 2013/4.⁵⁶ Collectively, musculoskeletal conditions demand considerable primary and secondary care resources. Each year, around one fifth of the population consult their GP about a musculoskeletal issue such as osteoarthritis or back pain.⁵⁷

For those with severely damaged or painful joints, joint replacements can restore joint function and can be life changing. In 2015 there were 98,211 hip replacement procedures (with a primary osteoarthritis diagnosis for 90% of patients) and 104,695 knee replacement procedures (with a primary osteoarthritis diagnosis for 98% of patients).⁹ The total cost to the NHS is considerable: a single hip replacement can cost between £5,000-12,000 depending on the complexity of the procedure⁶¹, and a knee replacement around £5,000.⁶²

Fractures are costly to the NHS: every year hip fractures alone account for 85,000 unplanned hospital admissions, 1.8 million bed-days and approximately £1.9 billion in hospital costs, and this does not include the high cost of social care.⁶³ Projections show that by 2036, hip fractures could account for up to 140,000 hospital admissions in the UK each year, with care and treatment costs rising to £6 billion.⁵⁸

Impact of musculoskeletal conditions

- Musculoskeletal conditions are the largest contributor to the burden of disability in the UK, and accounted for 30.5% of years lost due to disability in 2010.⁴
- Nearly three-quarters of people with osteoarthritis report constant pain, with one in eight describing the pain they experience as 'often unbearable'.²¹
- Musculoskeletal conditions account for the third largest area of NHS spending, with a programme budget of £4.7 billion in 2013/4.⁵⁶
- Each year, around one fifth of the population consult their GP about a musculoskeletal issue such as arthritis.⁵⁷
- Projections show that by 2036, hip fractures could account for up to 140,000 hospital admissions in the UK each year, with care and treatment costs rising to £6 billion.⁵⁸
- Only 59.4% of people of working age with a musculoskeletal condition are in work.⁵⁹
- 34.6% of people in receipt of the personal independence payment (PIP) in October 2016 were recorded as having a musculoskeletal disease as their main disability condition.⁶⁰

The costs of musculoskeletal conditions across the wider health and social care system are hard to determine. Much care for people with musculoskeletal conditions is delivered in community settings, where the NHS does not collect data. Likewise, there are no routinely collected data about the impact of painful musculoskeletal conditions on the need for social care.

2.3 Wider societal costs

The overall impact of illness on the UK workforce and economic productivity is well recognised.

Musculoskeletal conditions are the most prevalent diseases in the UK working population.⁶⁴ They account for the greatest number of working days lost with 32.4 million days lost in the UK in 2015.² Around one third of working days lost due to work-related ill health are due to musculoskeletal conditions.⁶⁵

Rheumatoid arthritis alone has been estimated to cost the UK economy between £3.8-4.8 billion per year⁶⁶, the combined costs of rheumatoid arthritis and osteoarthritis is estimated at £14.8 billion⁶⁷ and a further £10 billion of indirect costs are attributable to back pain.⁶⁸

People with musculoskeletal conditions are less likely to be employed than people in good health, and are more likely to retire early. Only six in ten people of working age with a musculoskeletal condition are in work.⁵⁹ Surveys suggest that one third of people with osteoarthritis retire early, give up work or reduce the hours they work because of their condition.²¹ Musculoskeletal conditions are a common reason for benefit claims. For example, 34.6% of those receiving personal independence payment (PIP) in October 2016 were recorded as having a musculoskeletal disease as their main disabling condition.⁶⁰

2.4 Return on investment in prevention of musculoskeletal conditions

Public Health England has commissioned York Health Economics Consortium to develop a return on investment (ROI) tool, to assess the cost-effectiveness of a number of prevention interventions for musculoskeletal conditions. The user-friendly economic tool will be available in 2017. It will use available evidence of cost-effectiveness and will model the expected costs and benefits of interventions to improve musculoskeletal health. Commissioners at both national and local level will be able to use the tool to compare the impact of different interventions and make the case for appropriate investment, based on perceived benefits such as improved patient outcomes, reduced cost to the NHS and social care and ability to work.

3: Provision of musculoskeletal physical activity model

3.1 Needs assessment and provision

The health needs of local communities should be described in the Joint Strategic Needs Assessment (JSNA) and acted on through the Joint Health and Wellbeing Strategy (JHWS). This represents an opportunity for local authorities and clinical commissioners to develop plans to enable and support physical activity for people with arthritis and musculoskeletal conditions.

Priorities for the JSNA and JHWS are set locally, and the needs of people with musculoskeletal conditions can be overlooked. In 2015, Arthritis Research UK reported that: ⁶⁹

- 1 in 4 local authorities had not included the needs of people with arthritis, musculoskeletal conditions or osteoarthritis in their JSNA;
- 64% of local authorities had not included osteoarthritis in their JSNA, even though at least 15% of over 45s in every area have osteoarthritis of the knee;⁶
- 62% of local authorities had not included back pain in their assessment, despite that fact that 17% of the population in England has back pain;
- Only one local authority included osteoarthritis in their JHWS to meet local health needs.

The needs of people with musculoskeletal conditions vary across populations, with some more severely affected than others. Likewise, people's needs vary throughout their life, as many musculoskeletal conditions fluctuate in severity over time and sometimes progressively worsen. So while some people can be independently physically active, others will need different levels of support to reach their activity goals, to improve and maintain their health.

3.2 Arthritis Research UK musculoskeletal physical activity commissioning pyramid

To support the commissioning of physical activity interventions of people with musculoskeletal conditions, Arthritis Research UK has developed

a model – the musculoskeletal physical activity commissioning pyramid – which sets out the four tiers of provision that could be provided locally (Figure 3):

- Tier 1: Accessible community facilities
- Tier 2: Supervised physical activity
- Tier 3: Structured community rehabilitation programmes
- Tier 4: Individualised support

The public health goal here is to maximise people's opportunities for physical activity. At any given time, there will be fewer people needing to access tier three and four services. Regular participation in lower tier activities will help prevent people's symptoms worsening. For those who do need to access higher levels of support to be physically active, the goal is to reduce symptoms, increase self-efficacy and restore confidence to be more independently physically active, using the provision lower down the pyramid (Figure 3).

A number of principles apply to how this model can be used.

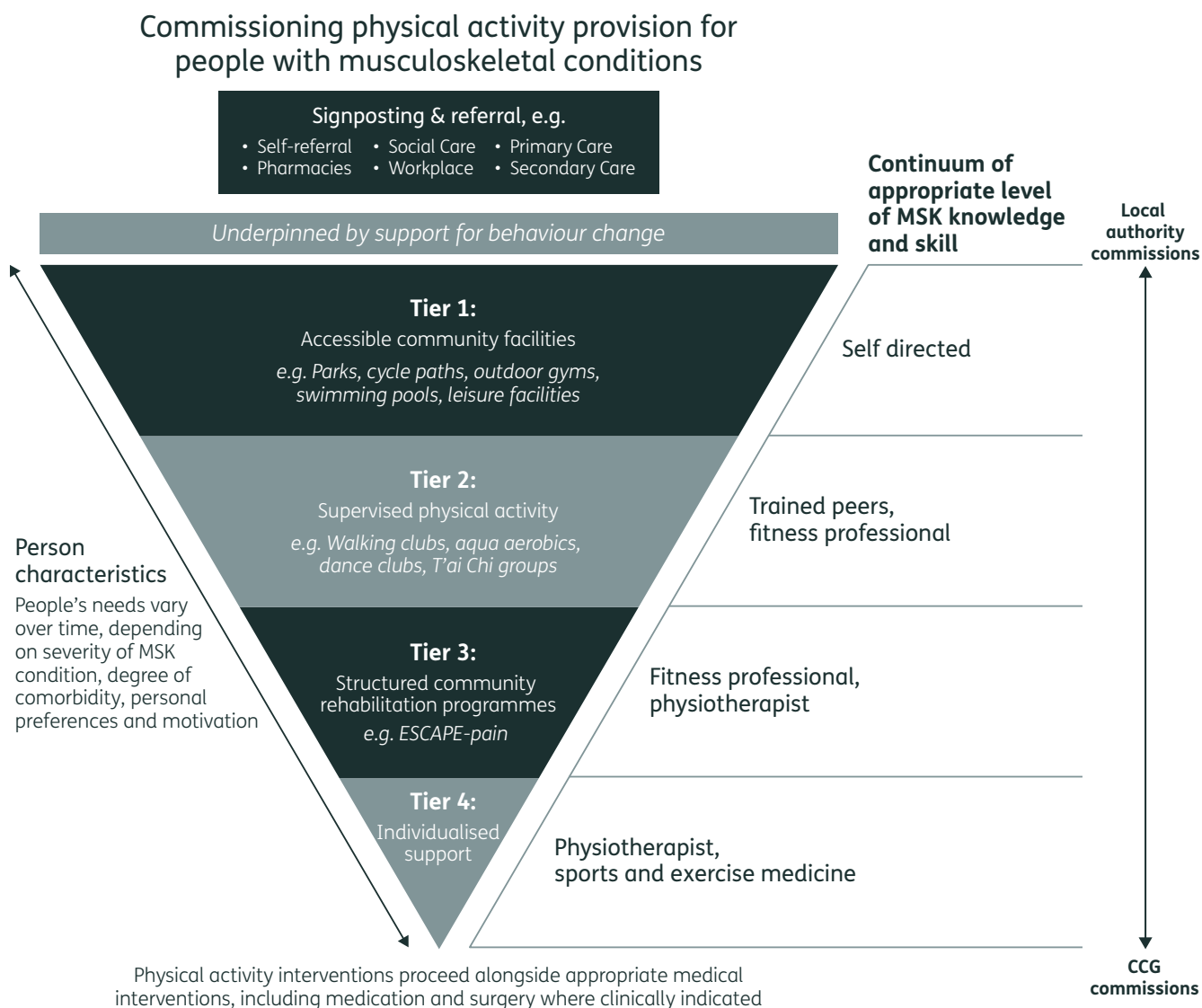
First, the purpose of this model is for commissioners to map, and highlight any gaps in, local physical activity provision for people with arthritis and musculoskeletal conditions. As well as local authority provision, this may include services and facilities that are owned, delivered and run by for-profit and non-profit sectors.

Beyond this, commissioners will also need to identify the range of access points (including health promotion activities, signposting and referral) into each of these tiers, so that people who will benefit can access the physical activity provision which is most appropriate for them.

Third, commissioners must recognise that people's needs and preferences will vary, and so pathways should be flexible so that they can access the right provision for them at the right time.

Finally, to be effective, all of this must be accompanied by well-designed behavioural change support.

Figure 3: Musculoskeletal physical activity commissioning pyramid



3.3 Tier 1: Accessible community facilities

General description	Facilities such as swimming baths, cycle paths, leisure facilities and self-guided activity support.
Examples of need	People are unable to use all or part of a facility due to their disability e.g. pool with difficult steps; staff at facility discourage people with arthritis from participating due to misconceptions about the condition; people with arthritis are unaware that the facility is suitable for them; economic models and calculators do not include the benefits of facilities to musculoskeletal health, and needs of those with musculoskeletal conditions are not recognised in JSNA/JHWS strategies, and pain is not recognised as a potential barrier to participation.
Example user	A person with arthritis who enjoys physical activity, including self-directed activity and whose symptoms do not limit their ability to be physically active.
Example provision	Accessible facilities, including hand rails and entrances (e.g. pool steps) that are arthritis-friendly; promotional and informational materials and resources (e.g. website, posters) reflect participation of people with arthritis and state the benefits of physical activity for people with arthritis; staff are well informed and supportive of the needs of people with arthritis.
Example resources	Most of the resources are available, but may need modification to ensure that needs of people with arthritis and musculoskeletal community are met.
Principal commissioning responsibility	Local authority.

Case study:

In the **East Riding of Yorkshire CCG** there has been close work between Local Authority Leisure Services, Public Health, NHS Commissioners and Hull University to develop health improving services based in leisure centres.

These services focus on chronic conditions and emphasise customer service; providing people with chronic conditions good services and working to improve their health. The service enables, for example, direct electronic referral from a GP to specific sessions, and has won national awards. This has saved the NHS money as people continue to use the leisure services by taking up their own membership following use of schemes. Work is planned in the future to specifically to target musculoskeletal disease and chronic pain.

More information is available online at:

<http://www.eastridingleisure.co.uk/health/exercise-referral/>

Case study:

Age UK in Oxfordshire has developed a physical activity service – **Generation Games** – to enable users to register and find out about physical activity sessions local to them across Oxfordshire. Aimed at inspiring the 50+ age group their goal is to ‘make you fitter and stronger, so that you can enjoy life to the full’. General health information is available on their website, as well as condition specific information, including arthritis.

More information is available at: <https://generationgames.org.uk>

3.4 Tier 2: Supervised physical activity

General description	Group activities run at regular intervals, led by peers or trained instructors; either generic or with specific content aimed at people with musculoskeletal conditions, with attendance predominantly via self-referral on a drop in/out basis.
Examples of need	Some activities are particularly unsuitable for people with arthritis, or need variable/adapted content (e.g. for someone who cannot get up off the floor, or who cannot do a particular movement); instructors may not be aware of, or sympathetic to, the needs of people with arthritis; people with arthritis may be unaware of the benefits of participation in these activities or how to access them.
Example user	A person with arthritis who enjoys supported physical activity in groups, whose symptoms do not limit their ability to be physically active, and/or who lacks the knowledge, confidence and self-efficacy to be independently physically active.
Example provision	This can include a range of different exercises, for example walking groups, dance groups, aqua-aerobics, T'ai chi groups, yoga or Pilates classes and others.
Example resources	A range of appropriate land- and water-based group activities with location, prices and timings meeting the needs of people with arthritis; wide promotion of activities and their musculoskeletal health benefits so that people with arthritis are aware of them; instructors have basic knowledge, skills and behaviours to support participation by people with arthritis.
Principal commissioning responsibility	Local authority.

Case study:

Walk with Ease (WWE) is a walking intervention (developed in the United States) specifically designed for people with arthritis and musculoskeletal conditions. The Oregon Health Authority chose WWE from the Centers for Disease Control and Prevention's approved evidence-based program list for its low cost and simplicity.⁷¹ It has been shown to be effective in reducing arthritis-related symptoms and improving physical function when delivered in either a group or self-directed format.

Arthritis Research UK is funding a UK-based WWE programme at the University of Aberdeen and will be closely following potential publications, breakthroughs or work that has direct patient benefits as a result of the programme. If successful, the programme has the potential for future implementation by the NHS as a treatment for arthritis/musculoskeletal conditions.

More information is available online at:

<http://www.arthritis.org/living-with-arthritis/tools-resources/walk-with-ease/>

International evidence:

A US study⁷⁰ looked at the benefit for older adults (over 60 years) of practising T'ai chi in a community setting, to improve pain and other health outcomes in those with knee osteoarthritis and cognitive impairment. The sessions were delivered three times a week for 20 weeks, with a control group attending classes providing health and cultural information for the same length of time. Various scores were administered at baseline, every four weeks and at the end of the study.

Eight sites participated in either the T'ai chi or the control group, with significant differences in the pain and stiffness scores between the two groups, with scores for these and physical function improving markedly more over time in the T'ai chi groups compared to control groups. No adverse events were found in either group and the study concluded practising T'ai chi regularly can be effective in reducing pain and stiffness in older people with knee osteoarthritis and cognitive impairment.

3.5 Tier 3: Structured community rehabilitation programmes

General description	Standardised, structured, time-limited programmes with defined session content (each session building on the previous one), led by trained instructors including physiotherapists with an outcomes based approach, to improve function and achieve specific, patient centred goals. People are expected to register (and/or be referred by a health or care professional) and to participate in whole programme; content (including physical activities and education) are aimed at reducing one or more specific musculoskeletal symptoms, which are usually measured and monitored before and after starting the programme.
Examples of need	Generic physical activities may worsen symptoms for some people with arthritis and musculoskeletal conditions, who initially need targeted muscle strengthening to reduce symptoms before they can increase physical activity generally; they may not address the specific fears and concerns that people with arthritis have about pain and physical activity, and may lack the trust of clinicians and people with arthritis.
Example user	A person with moderate or severe arthritis or musculoskeletal symptoms; one substantially deconditioned who finds that attempts at physical activity exacerbate symptoms; who lacks knowledge, confidence or skills to become safely, independently, physically active; who finds structured support necessary to become physically active.
Example provision	Defined, published programmes such as ESCAPE-pain ⁷² , Fit and Strong ⁷³ , or GLA:D (Good Life with Arthritis in Denmark). ⁷⁴
Example resources	An agreed, accessible programme available locally; standardised training programmes and materials for instructors; well-defined routes of self- and clinical referral in care pathways.
Principal commissioning responsibility	Local Authority/Clinical Commissioning Group (CCG) – Better Care Fund.

Case study:

ESCAPE-pain (Enabling Self-management and Coping with Arthritic Pain using Exercise) is a NICE-approved rehabilitation programme for people with chronic joint pain. It integrates educational self-management and coping strategies with an exercise regimen individualised for each participant. It helps people understand their condition, teaches them simple things they can do to help themselves, and takes them through a progressive exercise programme to learn how to cope with their pain better.

ESCAPE-pain has been recommended as a Tier 3 intervention following a review by an expert panel (section 5).

The programme is easy to implement and inexpensive to set up and run. ESCAPE-pain is currently running in 31 sites across the UK and Ireland – a mix of NHS physiotherapy departments, leisure centres and community venues.

www.england.nhs.uk/2016/09/michael-hurley/72

Robust evaluation shows that ESCAPE-pain:

- Reduces pain
- Improves physical function
- Improves the psychosocial consequences of pain: depression, people's sense of being in control of their problems, self-confidence and self-esteem
- Reduces healthcare and utilisation costs (estimated to trigger an annual saving of £1,417 per person)
- Creates benefits that can be sustained for up to 30 months after the end of the programme.

ESCAPE-pain has won awards from the Royal Society of Public Health and the British Society for Rheumatology. More information is available online at:

www.escape-pain.org

www.england.nhs.uk/2016/09/michael-hurley/72

International evidence:

GLA:D (Good Life with Arthritis in Denmark).⁷⁴ This project was initiated in Denmark in 2013, with more than 400 physiotherapists having joined the program and over 9,000 patients. The programme provides 2 x 90 min sessions, with an overall focus on increasing participants knowledge of osteoarthritis and how to treat it. Furthermore, patient education focuses on involving the participants. Outcomes have shown a reduction in sick leave, pain intensity and use of pharmacological pain relief and increases in physical activity levels. From a patient perspective, 94% of patients like GLA:D “much” or “very much” and use what they have learned at least weekly.

A total of 36 consecutive patients (31 women, 56-65-year-olds), forming part of a free treatment programme that the Municipality of Aalborg offered to employees with non-acute knee (27 patients), hip (six patients) or knee and hip (three patients) pain participated in the study.⁷⁷ In terms of cost-effectiveness, “future analyses from the GLAD-registry will show if a combined intervention including education and exercise has the potential to impact the number of health-care visits and the social costs associated with hip and knee osteoarthritis in Denmark.”⁷⁸

More information is available online at: <https://www.glaiddk/english.html>

Rehabilitation: the wider context

Rehabilitation is a personalised, interactive and collaborative process, reflecting the whole person. It enables an individual to maximise their potential to live a full and active life within their family, social networks, education/training and the workplace where appropriate.⁷⁵

Supported self-management is a major part of rehabilitation services, and quality guidance for this and other components has been developed.⁷⁶ Structured community rehabilitation programmes, such as cardiac or pulmonary rehabilitation, already have an important role in supporting self-management for people with these conditions.

Musculoskeletal conditions are the greatest cause of pain and disability in England. For people with osteoarthritis and back pain, physical activity reduces pain and improves function. Evidence-based musculoskeletal rehabilitation programmes such as ESCAPE-pain are a useful component of overall rehabilitation provision for local communities.

Case study:

Royal Borough of Greenwich Healthwise Physical Activity Referral Scheme (GP Referrals).

Healthwise is funded by the Royal Borough of Greenwich and run by Greenwich Better in partnership with other local organisations. The Healthwise scheme is available for all Greenwich borough residents who are interested in becoming more physically active. The programme helps individuals manage and/or improve their health condition(s).

The scheme runs for 13-weeks and offers support and motivation for people to become and remain physically active. Participants must be referred by their GP or nurse and will receive an individually tailored exercise programme and access to a number of classes across the Borough. These classes are delivered by a qualified and experienced instructor.

More information is available online at:

<http://greenwichhealthyliving.org.uk/3846/healthwise-physical-activity-referral-scheme-gp-referrals/>

3.6 Tier 4: Individualised support

General description	Individualised advice, support and interventions based on an individual assessment; usually delivered one-on-one by expert professionals, such as physiotherapists or sports and exercise medicine specialists.
Examples of need	Generic rehabilitation programmes may not cover some musculoskeletal problems, or may lack the intensity, specific and level of support that some people need to recover.
Example user	A person with an uncommon, complex or severe musculoskeletal health problem/s, or significant physical or psychological comorbidities.
Example provision	Commissioned physiotherapy services, community- and hospital-based; direct access physiotherapy through self-referral, or in general practices; specialist sports and exercise medicine clinics.
Example resources	Highly trained workforce.
Principal commissioning responsibility	Clinical commissioning group
Existing guidance	NICE recommends physiotherapy as a key intervention for people with rheumatoid arthritis, and back pain. People with osteoarthritis can also benefit from physiotherapy – NICE recommends that commissioners should ensure there is ‘sufficient capacity to meet demand for adults with osteoarthritis’. ⁱⁱⁱ

ⁱⁱⁱ NICE Clinical guidelines for lower back pain recommends manual therapy, including spinal manipulation, which can be performed by a health and care professional including a physiotherapist. The NICE Quality Standard for osteoarthritis recognises the importance of physical activity and the need for commissioners to ensure enough physiotherapy capacity for people with osteoarthritis.

Case study:

STarT Back provides stratified care for people with low back pain. It utilises an innovative tool to screen patients according to their risk of persistent low back pain disability, reducing over-treatment of low risk groups by ensuring their management is supported in primary care, and offering more effective and efficient targeted physiotherapy treatment for medium and high-risk groups.

It has shown to be clinically and cost effective, reducing healthcare utilisation e.g. GP visits, magnetic resonance imaging scans, medication and absence from work.^{79,80,81} Innovations such as the e-STarT Back tool integrated in EMIS and SystmOne and high quality patient information for use in GP consultations (accessible via patient.info) means that implementation of this approach has been adopted across the West Midlands Academic Health Science Network and beyond.

More information is available online at: <http://www.keele.ac.uk/sbst/>

Case study:

General Practice: West Cheshire. Direct access service to support musculoskeletal patients at GP practices. Over three months, 754 patients accessed the service, seeing physiotherapists for musculoskeletal complaints, rather than GPs. Over the three-month period, 52% of patients were discharged with advice; 34% were referred on to see a physiotherapist. In comparison, 84% of patients would have seen their GP. More information is available online at:

<http://www.csp.org.uk/professional-union/practice/your-business/evidence-base/physiotherapy-works/physiotherapy-works-prim>

4: Supporting musculoskeletal conditions with physical activity

4.1 Supporting behavioural change

There is strong evidence to suggest that changing people's health-related behaviour can have a major impact on some of the largest causes of morbidity, including arthritis and other musculoskeletal conditions. Changing physical activity behaviours in people with musculoskeletal conditions is difficult.⁸² The NICE behavioural change guidelines outline how this should be addressed.^{83,84}

Advice and support from health care professionals, practitioners and those working with people who have musculoskeletal conditions in the community encourages people to become more active. Attracting people to physical activity programmes means that we are asking them to change their existing and possibly well-established behaviour. Various factors can affect people's decision about taking part:⁸²

- Cultural and socio-economic factors
- Personal understanding of what physical activity is
- Past experiences with activity
- Understanding of the potential benefits that taking part might bring
- Recognising the benefits of physical activity, and that it will not worsen their musculoskeletal condition, but in fact will improve symptoms⁸⁵
- Matching behaviour change strategies to people's activation levels.⁵⁵

Identifying effective approaches and strategies that benefit the population as a whole will enable health care professionals and practitioners to operate more effectively, achieving increased health benefits with available resources.

Successful behaviour change strategies related to increased physical activity with adults who have a musculoskeletal condition have found that the following are likely to encourage and support maintenance of activity:⁸⁶

- Incorporating social support
- Motivational interviewing⁸⁷
- Encouraging self-efficacy
- Providing choices of activity
- Positive reinforcement.

Deeper understanding of the factors associated with physical activity participation may help to target groups who are in particular need of support.⁸⁸ Firstly, activity levels tend to decline as people get older, and it is this group of the population who are most at risk of osteoarthritis. Secondly, many people with osteoarthritis and other musculoskeletal conditions believe that "nothing can be done" to improve their symptoms; and that rest, not activity, is the best way to look after their joints.⁸⁹

Low levels of physical activity among those with osteoarthritis and other musculoskeletal conditions compound the public health problem, as those affected not only miss out on the opportunity to improve their musculoskeletal health, but also their metabolic, cardiovascular, respiratory and mental health.

Behaviour change theories and models

Behaviour change theory and models, are used to support and guide health promotion activities. These allow those developing and evaluating programmes to map the determinants of health behaviours and the barriers to change. Through doing this, organisations can focus on the activities that are most likely to lead to positive behaviour change.

Recent examples include:

- Sport England's guide on tackling physical inactivity⁹²
- Macmillan Cancer Support's Move More programme⁹³
- British Lung Foundation's BLF Active groups⁹⁴

Self-management

NHS England is also undertaking work focused on self-management. Their 'Realising the Value' programme aims to empower people and communities to take more control of their health. The programme is looking at:

- Self-management education
- Peer support
- Health coaching
- Asset-based approaches in a health and well-being context

More information is available online at: <https://www.england.nhs.uk/ourwork/patient-participation/self-care/value-prog/>

Case study:

Health Trainer programme. 'Health trainers' were first outlined in the Choosing Health White Paper (2004).⁹⁰ The Health Trainer Programme aims to increase individual skills, capacity and resilience whilst promoting self-care and self-management of long-term conditions. The programme recruits, trains, supports and employs people from local neighbourhoods as health trainers to help deliver the programme.

In 2011, Sheffield Primary Care Trust piloted and evaluated the effectiveness of a Health Trainer Programme targeted specifically at people with chronic pain.⁹¹ The programme delivers one-to-one support over a 6-7 week period to set goals around the participant's individual health needs. The health trainer programme is advertised on the Sheffield community forum website where participants can find contact details and addresses for locations.

It is commissioned by NHS Sheffield and delivered by partner organisations in the voluntary sector as a free and confidential service. Initial evaluation after 9 months of the pilot programme, targeting people with chronic pain, indicated that participants experienced increased skills and physical ability to self-manage their pain, greater understanding of how to use related health information, and increased reflective motivation ability to weigh positive and negative consequences of behaviour change.

More information is available online at: <http://healthtrainersengland.com/>

4.2 Navigating the pyramid

The purpose of the pyramid is to ensure that the full range of physical activity provision is available for people with musculoskeletal conditions.

People can engage with different tiers of physical activity provision depending on, for example, the severity of their musculoskeletal condition, multimorbidities they may have (such as cardiovascular or respiratory disease), as well as personal motivation and preferences. Because musculoskeletal conditions often fluctuate in severity over time, and sometimes progressively worsen, the most suitable tier of provision may also vary over time.

Sue is a 65-year-old woman with painful osteoarthritis of the knee interfering with her daily activities e.g. walking. She was referred to a physiotherapy led rehabilitation programme which she attends and on completion is signposted towards a local walking group to maintain strength and provide support to help her to continue being physically active. Sue enjoys this and keeps it up, but finds out that others in her group swim at a local leisure centre and starts to join them there informally once a week.

As people's musculoskeletal symptoms improve through their physical activity, their needs may change and they may be able to use a lower tier of provision in order to maintain and improve their musculoskeletal health. So, for example, someone with osteoarthritis may find that after taking part in a structured community rehabilitation programme such as ESCAPE-pain (Tier 3) they can maintain their musculoskeletal health through a walking group (Tier 2), or by using accessible community facilities such as a swimming pool (Tier 1) – there is of course no requirement for people to engage with each tier in order. For example, BLF Active is a network of fitness instructor-led specialist exercise classes for people with chronic lung disease after they have completed pulmonary rehabilitation.⁹⁴

People's needs can also increase. Someone who keeps their back pain under control by regularly taking part in an aqua aerobics class (Tier 2) may have a severe flare and need individualised support from a physiotherapist (Tier 4) for a time, before returning to their aqua aerobics class when the flare has subsided.

Tom is 50 years old and has back pain. He has an exacerbation of his symptoms and is advised by occupational health at work to become more active. Tom attends his local leisure centre and takes part in a T'ai Chi class. After a couple of sessions, the T'ai Chi instructor notices that Tom is struggling, and suggests that he seeks a referral from his GP to physiotherapy, or if available in his area, that he self-refers to physiotherapy, and returns to classes once things are improved. Tom attends physiotherapy and on completion returns to T'ai Chi classes, which he is able to participate in successfully.

For this to work, professionals and services at every level of provision need to be able to signpost people to other tiers of provision, encouraging and supporting people to identify how they can best engage with physical activity to improve their musculoskeletal health. The health and social care system can formally support people with this process through shared decision making processes including through 'care and support planning'.¹

4.3 Commissioning and workforce

Physical activity provision for people with musculoskeletal conditions

The NHS Five Year Forward View calls for a 'radical upgrade in prevention and public health' to ensure the sustainability of the NHS and economic prosperity.⁹⁵ In addition it proposed that CCGs have more influence over the wider NHS budget, enabling a shift in investment from acute to primary and community services.⁹⁵ CCGs can use funding to invest in physical activity programmes in partnership with local authorities and other community organisations.

The delivery of the Five Year Forward View will be supported by 44 Sustainability and Transformation Plan (STP) areas which are place-based, five year plans built around the needs of local populations. STPs encourage collaboration between CCGs and other healthcare organisations to ensure better integration with local authority services, to help deliver financial balance and ensure the best use of resources.

The transition of the delivery of public health services to local authorities following the Health and Social Care Act (2012) has been a major shift. This presents opportunities for local authorities to improve the health of their populations through early interventions and the promotion of good public health. Health and Wellbeing Boards should use the range of resources available such as JSNA/ JHWS to consider wider factors that may be relevant in improving health and wellbeing outcomes in their local populations. This outcomes based approach will then inform local commissioning needs.

The Better Care Fund represents a unique collaboration between NHS England, the Department of Communities and Local Government, the Department of Health and the Local Government Association, working closely together in order to ensure the seamless planning and delivery of local health and social care services across England.⁹⁶ The primary aim of the Better Care Fund is to place customer-focused services and to incentivise the integration of health and social care. Part of the purpose of the Better Care Fund is to reduce the number of hospital and care admissions. In recognition of the rising need for adaptations,

central government funding for the Disabled Facilities Grant has been increased considerably.⁹⁷

Workforce

An effective workforce to promote physical activity for people with musculoskeletal conditions needs two things. First, those delivering health care for people with these conditions should promote physical activity and support behaviour change. An example of this is how the NHS has developed an initiative called 'Making Every Contact Count'¹⁵ to encourage organisations responsible for the health, wellbeing, care and safety of the public to implement and deliver healthy messages systematically through their patient contact.

Second, those who already promote physical activity and support behaviour change should understand how musculoskeletal conditions affect, and are affected by, physical activity. In particular, there should be universal recognition of the principle that people with musculoskeletal conditions can reduce their symptoms through appropriate physical activity and that too much rest can be harmful.

Health care commissioners and providers should ensure there is appropriate training in physical activity promotion, including both clinical and non-clinical front-line staff. All provider staff should be aware of the role of primary, secondary and tertiary healthcare in the prevention of musculoskeletal ill-health, recognising that everyone has a role in supporting this. All provider staff across sectors could:

- promote the musculoskeletal health benefits of physical activity;
- signpost people to community assets for physical activity provision;
- support those who are able to remain at or return to work;
- avoid an excessively medical focus on musculoskeletal health problems, such as back pain, where the solution is unlikely to be medical.

Staff need support to develop the capability, opportunity and motivation to both promote physical activity to people with musculoskeletal conditions, and to enable and empower people to navigate local physical activity provision.

A public health approach to physical activity promotion includes other front-line public sector workers, such as fire and rescue officers or police officers; people working in leisure centres, community centres or voluntary groups; employers and those who support them; as well as those who are commissioning, developing, implementing or evaluating programmes, including the public health workforce. These communities need to develop a shared understanding not only of the core knowledge and skills about the benefits of physical activity in general, but specifically recognising the benefits to people with painful musculoskeletal conditions, and addressing the barriers to physical activity from pain, muscle weakness or poor balance.

In 2017, Health Education England (HEE) will outline an education and training framework to support professionals to deliver person-centred care. This will address workforce capability and behaviours to deliver approaches including ‘making every contact count’, shared decision making, care and support planning, behavioural change techniques/support health coaching. By focussing on what matters to the individual and supporting change that is meaningful to them, care is more likely to deliver desirable outcomes. For example, this would include supporting people with joint or back pain to identify the role they want physical activity to play in improving their musculoskeletal health, the types of physical activity that they want to engage in, and how they can make the necessary changes to incorporate this into their life.

Case study:

Osteoarthritis JIGSAW – The Management of OsteoArthritis in Consultations study: the development of a complex intervention in primary care (MOSAICS) developed a range of tools for GPs for patients who present with osteoarthritis, including a NICE endorsed template to support the uptake of NICE guidelines core recommendations. Training for practice nurses also enables them to support patients through the use of the Arthritis Research UK Osteoarthritis Guidebook and to signpost patients to supported community facilities to become more physically active to manage their own symptoms. NHS Shropshire, NHS Telford and Wrekin and NHS North Staffordshire CCGs are working jointly, via practice nurses, health trainers and physiotherapists to provide supported self-management to patients. The approach is also being rolled out across Europe through a European Institute of Innovation and Technology Health grant.

More information is available online at:

<http://www.keele.ac.uk/pchs/disseminatingourresearch/researchtools/oe-template/>

5: Populating the pyramid: review of evidence

The musculoskeletal physical activity commissioning pyramid is not prescriptive about what facilities, activities and programmes may populate each tier locally. Generally, this will vary between communities and over time, depending on local circumstances and public/patient preferences.

For Tier 3, (structured community rehabilitation programmes) however, it is useful to have an agreed, standard rehabilitation programme for implementation. This will allow for the development of high-quality training packages and supporting materials, strengthening the evidence base, sharing of learning between sites and help to minimise unwarranted variation in care.

To support this report, Arthritis Research UK commissioned an evidence review panel of people with arthritis, clinicians, academics and policy makers to review the published evidence, and arrive at a consensus based recommendation of a structured community rehabilitation programme for the management of joint pain.

The review considered nine key criteria,^{iv} ranked high, medium or low priority, in evaluating nine musculoskeletal joint pain rehabilitation programmes that come under Tier 3 of the pyramid.

The panel identified and reviewed established programmes that:

- included, as a minimum, a strengthening exercise programme that was evidence-based at reducing joint pain and improving function);
- had a solid, published evidence-base for benefit;
- could be delivered by a single appropriately-trained individual (e.g. fitness instructor) or health professional;
- would be scalable to the population in England.

The scope of the panel review activity was agreed:

- Ideally the group would review programmes suitable for people with musculoskeletal pain generally rather than specifically hip or knee pain, which would be particularly valuable from a general practitioner and commissioning perspective.
- As most of the published programmes and supporting evidence is based on improving hip and knee symptoms, reviewers would initially focus on the lower limbs, but subsequently would investigate and report back to the group on suitable spinal and upper limb programmes.

Initially nine programmes were identified, and after detailed discussion, the ESCAPE-pain package was selected because of its:

- robust evidence base including efficacy and health economics.
- development in the UK, which makes it culturally appropriate.
- established track record of local delivery in an NHS setting.
- success in trials by fitness instructors and physiotherapists.
- suitability for implementation in primary- and secondary-care settings.

A full report of this evidence review is available on the Arthritis Research UK website.⁹⁸

^{iv} Evidence review criteria: Effectiveness, feasibility, cost, sustainability, ethical acceptability, social will, political will, potential for unintended benefits and potential to 'do no harm.'

6: Diagnostic checklist

This checklist aims to support commissioners to map out, and highlight any potential gaps in, local physical activity provision for people with arthritis and musculoskeletal conditions

Q1 What services are currently available for people with musculoskeletal conditions?

Behaviour change interventions

- Brief interventions etc
- CBT
- Apps/web tools
- Health trainers
- Other _____

Tier 1

- Leisure centres
- Parks/Open spaces
- Other _____

Tier 2

- Osteoarthritis specific exercise classes
- Back pain specific exercise classes
- Exercise referral
- Other _____

Tier 3

- Joint/spine rehabilitation services
- Physiotherapy services for osteoarthritis
- Physiotherapy services for back pain
- Other _____

Q2 How can people access physical activity services specific to musculoskeletal health?

- Self-referral
- Referral by GP
- Referral by physiotherapist
- Referral by other health care professional
- Secondary care
- Pharmacies
- Single point of contact i.e information hub
- Other _____

Q3 Have you worked in partnership with any of the following organisations on a physical activity intervention for people with musculoskeletal conditions?

- Charities
- Retirement communities
- Faith-based communities
- YMCA (or similar)
- Schools/colleges
- Swimming pools
- Leisure centres
- Other _____

Q4a What activities in the local community have included reference to physical activity and musculoskeletal health?

- Promotion or NHS Choices
- Promotion of Change for Life
- New One you campaign
- Specific campaign
- Other _____

Q4b What training have front line staff had on delivering musculoskeletal messages?

Q5 How are musculoskeletal conditions reflected in the local Joint Strategic Needs Assessment/Joint Health and Wellbeing Strategy?

Q6 How do you identify which people with musculoskeletal conditions may benefit from physical activity interventions?

Q7 What population data is collected on people with musculoskeletal conditions, including in the Joint Strategic Needs Assessment?

Q8 What population data is collected on people with musculoskeletal conditions who undertaken physical activity/are on specific physical activity programmes?

Q9 How well are current services used (that are specific to physical activity and musculoskeletal)?

Q10 Has an assessment been undertaken to ensure there are appropriately skilled professionals to support people with musculoskeletal conditions being appropriately physically active?

Local environment

Q11 Has an assessment of what local physical activity resources are available to the local community been undertaken? For example parks, open spaces, leisure centres.

Q12 Have access issues been considered i.e. rail/steps in swimming pools – to enable people with musculoskeletal conditions to use facilities?

Q13 Are there any gaps? If so, are there are plans to address these?

Q14 How are the availability of these resources communicated to local health professionals and services, including community pharmacists?

Q15 What links have been made with local councils to ensure appropriate transport planning to access such facilities?

Physical activity programmes for people with musculoskeletal conditions

Q16 Are physical activity programmes promoted as being suitable for people with musculoskeletal conditions?

Q17 Do you provide physical activity classes/ programmes that are specific to musculoskeletal conditions?

Q18 How are people able to access these programmes?

Q19 Are neighbouring areas providing any other interventions, which you could link with/learn from?

Q20 What groups/services are available locally to support people with taking up physical activity who have musculoskeletal conditions?

Q21 Is any joint work undertaken with local authorities on prioritising musculoskeletal conditions?

Q22 Are positive messages about physical activity and musculoskeletal conditions promoted in the local community? If so, by what routes?

Q23 If so, do you have any outcome data from these services/programmes? What does the data tell you?

Q24 How are musculoskeletal health specific programmes evaluated?

Q25 What information is provided to patients about the benefits of physical activity for musculoskeletal health?

- Promotion of NHS Choices
- Leaflets from [organisations like Arthritis Research UK]
- Specific campaign
- Other _____

Q26 How does your physical activity provision for people with musculoskeletal conditions, (including tier 3 provision) link to your overall rehabilitation programme?

Workplace health

Q27 Are there any staff workplace schemes to support early access to rehabilitation programmes for musculoskeletal conditions?

7: Resource library

Understanding musculoskeletal conditions

- Arthritis Research UK:
 - Musculoskeletal health: a public health approach (2014)
 - A fair assessment? Musculoskeletal conditions: the need for local prioritisation (2015)
 - Osteoarthritis in general practice: data and perspectives (2013)
 - Working with arthritis (2016)

Understanding physical activity

- UK CMOs physical activity guidelines/physical activity infographic (2011)
- NHS Choices
- Everybody Active, Every Day: An evidence-based approach to physical activity (PHE 2004)
- ARMA Policy Position Paper: Physical Activity and Musculoskeletal Health (2016)

NICE clinical guidelines

- NG59 Low back pain and sciatica in over 16s: assessment and management (2016)
- CG177 Osteoarthritis: care and management in adults (2014)
- PH41 Physical activity: walking and cycling (2012)
- PH54 Physical activity: exercise referral schemes (2014)

NICE read codes

- N05 Osteoarthritis and allied disorders
- N09 Other and unspecified joint disorders

Learning modules

- BMJ e-learning module: The health benefits of physical activity: osteoarthritis and low back pain

Resources to support Practitioners/Commissioners

- STarT Back www.keele.ac.uk/sbst
- Arthritis Research UK osteoarthritis guidebook and toolkit:
<http://www.keele.ac.uk/pchs/disseminatingourresearch/researchtools/oe-template/>

- Arthritis Research UK Primary Care Centre has produced an e-Template that supports the majority of recommendations relating to diagnosis, assessment and management in the NICE guideline on osteoarthritis. In addition it also supports the statements about diagnosis, assessment and management in the NICE Quality Standard for osteoarthritis.
- The resource can be obtained by contacting Arthritis Research UK Primary Care Centre directly via the osteoarthritis e-Template. Endorsed tools are complementary information that may be of interest to you from sources outside of NICE. This tool has been developed by Arthritis Research UK Primary Care Centre and is not maintained by NICE. NICE has not made any judgement about the quality and usability of the resource. In the event of any issues or errors, please contact the Arthritis Research UK Primary Care Centre in the first instance.
- Arthritis Research UK Musculoskeletal Calculator: allows you to compare the prevalence of musculoskeletal conditions in different areas. Local authorities may wish to use the findings as part of their Joint Strategic Needs Assessment/Joint Health and Wellbeing Strategy
<http://www.arthritisresearchuk.org/arthritis-information/data-and-statistics>

Other commissioning resources

- NHS England commissioning guidance for rehabilitation (2016): Available at <https://www.england.nhs.uk> by searching for 'rehabilitation commissioning guidance'
- Health Matters: Getting every adult active every day (July 2016). Public Health England
- Walking for Health: England's largest network of health walk schemes, run by the Ramblers and Macmillan Cancer Support <https://www.walkingforhealth.org.uk>
- Public Health England's Local Health and Care Planning: Menu of preventative interventions (November 2016). Available at <https://www.gov.uk/> by searching for 'menu of preventative interventions'

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Appendix

List of attendees at the improving musculoskeletal health through physical activity ad hoc meetings
(Titles correct at time of meetings)

Arthritis Research UK

Dr Benjamin Ellis – Senior Clinical Policy Advisor (Chair)
Tracey Loftis – Head of Policy and Public Affairs
Anne Kelleher – Health Promotion Manager
Katherine Stevenson – Policy Officer

Department of Health

Jane Allberry – Deputy Director, NHS Clinical Services
Geoff Dessent – Deputy Director, Physical Activity, Health and Work
Anna Garratt – Early Diagnosis Lead, NHS Clinical Services
Tim Marshall – Policy Advisor, NHS Clinical Services
Dan Immambocus – Policy Advisor, NHS Clinical Services
Geila Alpion – Policy Advisor, NHS Clinical Services
Beelin Baxter – Senior Policy Advisor, Physical Activity Team
Liliya Skotarenko – Policy Lead, Obesity
Alison Raw – Allied Health Professions Adviser

NHS England

Professor Peter Kay – National Clinical Director Musculoskeletal Services
Colonel John Etherington – National Clinical Director for Rehabilitation and Recovering
in the Community
Sarah Marsh – Programme Manager, Long Term Conditions Clinical Policy and Strategy Unit
Shelagh Morris – Deputy Chief Allied Health Professions Officer
Niall McDermott – Domain Team Lead, Medical Directorate
Alice Rose O’Connell – Programme Manager, Musculoskeletal Services
Lindsey Hughes – Improving Rehabilitation Services Programme Lead

Public Health England

Nuzhat Ali – National Health and Wellbeing Older Adults and MSK Lead
Dr Mike Brannan – Deputy National Lead for Adult Health and Wellbeing
Dr Justin Varney – Deputy Director for Health and Wellbeing (Healthy People)

Other

Anita Silk – Health and Work Police, Department for Work and Pensions
Stuart Palma – Professional Adviser, Chartered Society of Physiotherapy
Professor Mark Batt – Arthritis Research UK Centre for Sport, Exercise and Osteoarthritis
Professor Philip Conaghan – Professor of Musculoskeletal Medicine, University of Leeds
Professor Tony Woolf – ARMA Vice-Chair and Chair of the Bone and Joint Decade
Dr Ian Bernstein – Ealing CCG
Helen Duffy – Manager, Primary Care Musculoskeletal Research Consortium, Keele University
Dr Emma Healey – Research Fellow, Keele University
Dr Tim Allison – Director of Public Health, East Riding of Yorkshire Council
Louise Barnett – Physical Activity Specialist, Greenwich Council
Dr Clare Jinks – Senior lecturer in Health Services Research, Keele University
Alastair Mew – Head of Commissioning, Urgent Care, NHS Sheffield CCG



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