

Informing planning for upstream interventions to reduce orthopaedic demand

Phase One Report: Mapping prevention opportunities

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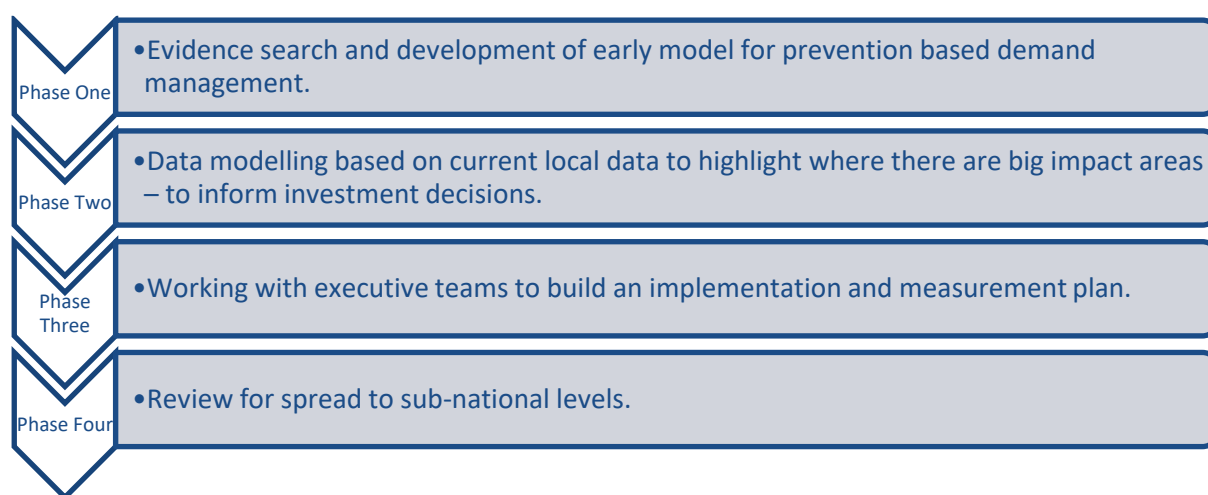
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1. Introduction

We undertook a Prevention Mapping exercise as a way to support modelling around upstream interventions that can reduce orthopaedic demand. This report represents the findings from Phase One of the project. **The report is designed as a starting point for discussions to inform the next phase.** It starts the thinking around elements of a preventative approach to reducing orthopaedic demand. The next steps will be to critically engage with these early findings, and develop an approach to flow and financial modelling that will support decision making.



The aim of this exercise was to:

- identify upstream intervention that can reduce demand on specialist orthopaedic services, including surgery
- build an evidence base to support decision-making about where to target investment upstream at different points in the system
- take a person-centred approach which considers how interventions need to be delivered to support engagement with services, and therefore realise the benefits of the interventions
- use research findings to undertake modelling based on Scottish data to inform sub-national planning

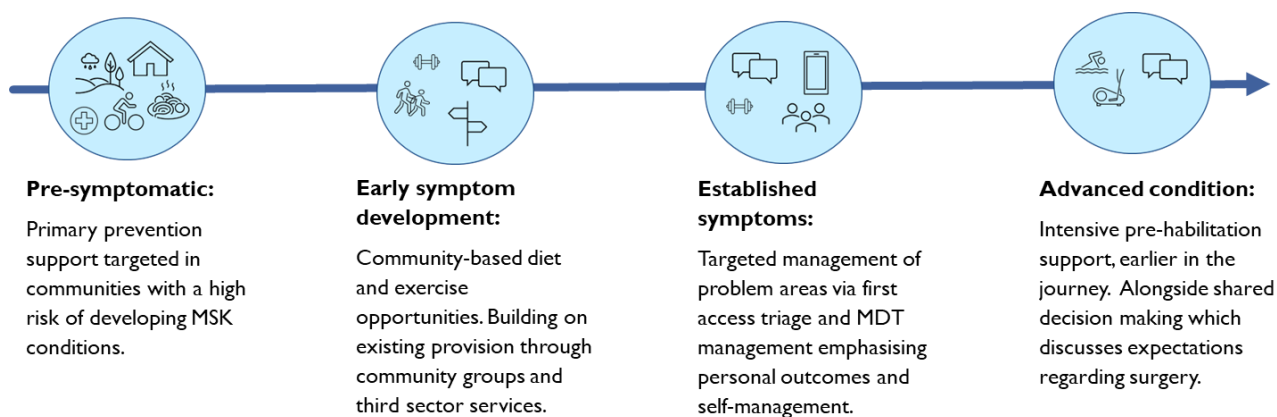
Through an initial evidence review we have built an understanding of what interventions are effective in supporting Musculoskeletal (MSK) conditions at different points.

We looked at national and international evidence on:

- which interventions provide good outcomes for people
- the impact of different interventions on service use
- what is required for people to engage with interventions, and ensure sustained benefit
- how services need to support people to think about different options

2. Summary of findings

A review of evidence around prevention in MSK suggested a four-level model based on a life-course approach. This is consistent with work relating to long-term and chronic conditions. One of the questions for the evidence is to understand what is effective in supporting people at different points, and how this can reduce demand on specialist orthopaedic services. By reducing avoidable referrals, imaging, and progression to surgery, and by optimising outcomes for those who do proceed, this approach offers a credible invest-to-save strategy that improves long-term affordability without compromising care quality.



Within each level of this model, we outline what the evidence states in terms of:

- what the intervention involves
- what the benefits are
- how this might impact service use
- what needs to be considered to support engagement with the intervention
- what needs to be considered in terms of decision-making to direct people towards the intervention

Managing demand in specialist orthopaedics services is a high priority. Looking at 'time to impact' evidence showed that looking at demand management from the first contact is an effective, fast way to stop the flow of people into specialist services.

An evidence-based model for conservative management of MSK conditions includes:

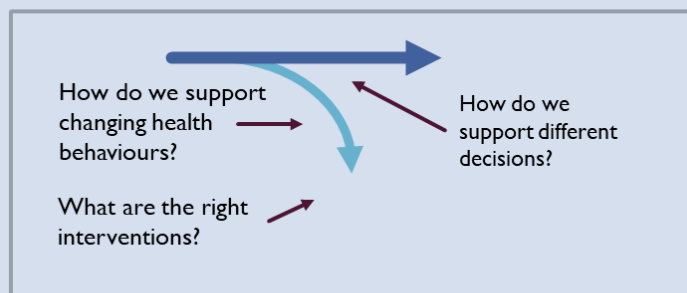
- rapid-access MSK triage led by allied health professionals (AHP) and first contact practitioners
- multidisciplinary management based in primary care, including physiotherapy, joint pain practitioners, dietitians
- behaviourally-informed physical activity programmes addressing pain beliefs
- community-based group delivery models to increase reach and reduce cost
- 'waiting well' support to reduce risks of deterioration of conditions
- robust 'pre-habilitation' services that can help people reconsider the need for elective surgery

We also looked at what the evidence said about ensuring that people engage with preventative/early intervention services.

The evidence highlights the importance of:

- self-managed activities that help people feel they have control over their condition
- conversations about personal outcomes and motivational interviewing techniques
- addressing fears regarding exercise and pain
- shared decision-making that is informed by a range of practitioners and incorporating patient-reported outcomes to guide conversations relating to treatment options

Approach to understanding how we shift services and behaviours to redirect demand for specialist orthopaedic services at different points.



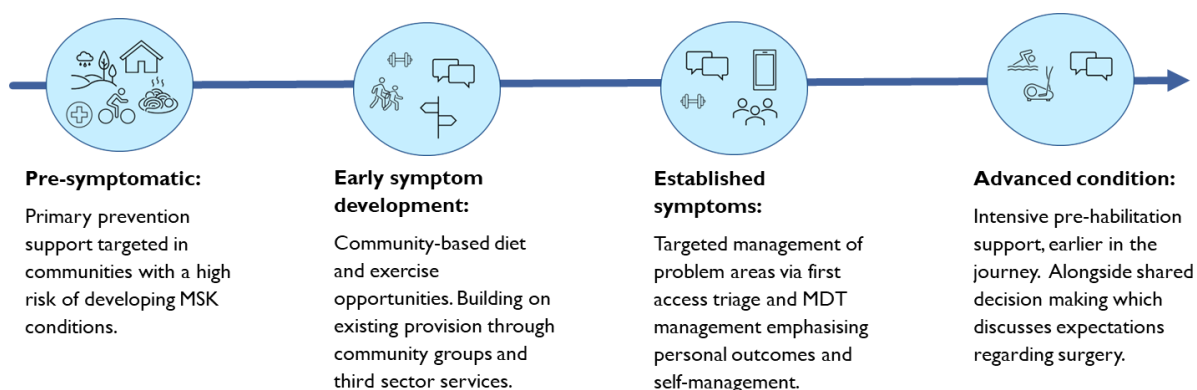
To do this we want to understand how to optimise demand and use patient-centred outcomes (such as ICHOM) to support shared decision making.

3. Developing a preventative model

MSK conditions represent one of the largest drivers of demand, disability, and cost pressure across NHSScotland. Despite sustained effort, access standards for MSK services are not being met, with rising referrals and prolonged waits for first contact care. Current system responses focus predominantly on increasing downstream, acute and elective capacity, particularly surgical beds. While this may temporarily alleviate waiting lists, it does not address the upstream drivers of demand or offer a sustainable long-term financial solution.

This proposal sets out an evidence-based case to shift the balance of MSK care decisively towards prevention and conservative management, while retaining high-quality, optimised surgical pathways for those who need them. The approach aligns with NICE guidance, Scottish MSK pathway standards, and emerging UK and international economic evidence demonstrating that conservative, community-based MSK interventions are clinically effective and highly cost-effective.

The preventative model is adapted from Arthritis UK and sits within the stated scope of Population Health Planning with regards to prevention.



Within each of these elements, this report will outline what good practice looks like in relation to:

- what the intervention involves
- what the benefits are
- how this might impact service use
- what needs to be considered with regards to supporting engagement with the intervention
- what needs to be considered with regards to decision making to direct people towards the intervention

4. Considerations for preventions

To realise the benefits of preventative interventions there are a number of considerations around how they are delivered. It is important that people are able to access the services being provided, and that they are able to maintain the benefits of those.

This is particularly important in reducing health inequalities. Further to this, many of the interventions have been tested at small (health board or equivalent) scale relative to the sub-national population. Therefore, in scaling these interventions there needs to be an understanding of barriers specific populations might have in engaging with them. Otherwise, health inequalities are likely to be further entrenched.

For example, if you develop an evidence-based exercise programme for improving joint function shown to reduce demand on orthopaedic services – this reduction will only happen if:

- people are given the option to join the programme – usually via a healthcare professional
- people are motivated to join the programme – they understand the benefits of the programme
- people are able to attend/do the activities – they have access to open space, gyms, or community centres
- people change their health behaviours over a sustained period – they are able to self-manage

This section outlines some broad approaches from the literature that need to be considered when implementing preventative interventions.

4.1 Inequalities and access

For preventative interventions to be cost-effective and sustainable, they must be easy to find and access for all, especially those most at need. Designing interventions must take into account and address the overrepresentation of MSK issues in certain groups, and work towards reducing risk of inadvertently widening inequalities through inequitable uptake.

Key MSK inequalities in Scotland and the UK

Deprivation

- People in deprived areas are more likely to develop MSK conditions, develop them earlier, and experience greater severity and complexity (e.g. multimorbidity).
- Scotland has the widest deprivation gap in MSK prevalence in the UK (approximately 26% compared with ~12% in England).
- In the most deprived communities in Scotland 23% of adults have a musculoskeletal condition, compared to the least deprived areas where 15% are affected.
- Sickness absence is more common and more prolonged in deprived areas, reinforcing income and health inequalities.

- Earlier onset in deprived populations compounds disadvantage across the life course, particularly in relation to employment and caring responsibilities.

Race and ethnicity

- Higher prevalence of MSK issues among Black, Asian, and Minority Ethnic groups.
- People from Pakistani and Black Caribbean backgrounds have higher risk of activity-limiting long-term pain.
- Black, Asian, and Minority Ethnic groups face distinct challenges in the management of MSK conditions:
 - greater levels of disability
 - reduced access to specialist care
 - diagnostic delays
 - underutilisation of services
 - language and communication barriers
 - differing cultural health beliefs
 - socioeconomic disadvantage, and
 - systemic bias within healthcare systems.

Disability and long-term conditions

- People with MSK conditions are more likely to live with additional long-term conditions, increasing complexity of care and risk of poorer outcomes.
- MSK conditions can both cause disability and exacerbate existing disability, making intersectional disadvantage particularly important.

To address these issues, interventions should be resourced and delivered at a scale and intensity proportionate to the degree of need, adopting an approach described by Public Health Scotland as [proportionate universalism](#).

Ethnic diversity, educational background, healthcare access, and personal preference can influence the feasibility and effectiveness of interventions. When designing and implementing preventative services it is important to think about how people will access services and engage with the support.

To maximise reach and benefits/impact, key aspects to consider are providing resources and access, utilising and further developing community assets, and building upon trusted relationships and community strengths.

4.1.1 Embedding support in communities

Trusted groups and networks play a critical role in improving uptake and impact, this includes community organisations, faith groups and voluntary/third sector groups.

Delivery through community settings is shown to:

- Increase reach among individuals who may not regularly engage with clinical services

- Reduce feelings of intimidation or exclusion associated with hospital-based care
- Support ongoing engagement outside formal healthcare appointments
- Increase likelihood of sustained behaviour change and adherence to treatment and lifestyle advice
- Encourage shared learning and family-level engagement

Community-delivered interventions benefit from:

- Pre-existing trust and credibility within communities
- Cultural alignment with beliefs, values, and lived experiences
- Familiar and safe environments that encourage open discussion and learning

Peer-led and community-supported approaches:

- Improve trust in health information
- Reduce perceptions of discrimination or marginalisation
- Enhance confidence in navigating health services

4.1.2 Accessible language, education and communication

Interventions designed to overcome language and communication barriers improve engagement with services from those who have limited English. These include printed leaflets, culturally relevant illustrations, online resources, bilingual educational audio CDs, and a multilingual telephone helpline.

Such approaches are effective in:

- Reducing linguistic barriers and perceptions of discrimination
- Supporting people to understand their condition
- Developing stronger communication between people and their healthcare professionals, essential for shared decision making

4.1.3 Physical therapy aspects

When delivering physical therapies, it is useful to consider the potential high prevalence of manual labour jobs within certain groups and communities, and conditions and injuries related to these. Interventions should include task-specific functional movement training to remediate movement impairments and minimize cumulative stresses on the spine throughout the day. Emphasis should be placed on instructing patients in safe postures and movements to reduce expectations of pain and fear of reinjury while engaged in appropriately paced activities of daily living.

4.2 Designing interventions for behaviour change and motivation

Interventions need to be designed with an understanding of what is required to support long-term behaviour change and at different points in the patient journey. Supporting behaviour change and motivation is essential, as adherence and patient engagement are a decisive factor in whether interventions work.

Where participation is low or inconsistent, outcomes are weaker even when interventions are evidence-based. Interventions that do not actively design for engagement are unlikely to support behaviour change and motivation, nor deliver sustained impact or benefits.

Common barriers to adherence

- lack of time and competing commitments
- low self-regulation skills
- low motivation and confidence
- fear of pain/injury
- low health literacy
- structural and socioeconomic aspects, such as socioeconomic disadvantage, cost concerns, and digital exclusion

How interventions are designed and delivered matters as much as what is delivered; to bring about behaviour change, intervention design and delivery need to support increased engagement.

Aspects that support behaviour change through increased motivation and adherence

- equity-focused design ensuring reach and relevance
- multicomponent programmes that include education and psychological support
- clear structure with effective coordination and defined expectations
- appropriate screening to help identify relevant interventions for each patient
- active involvement of patients through informed and shared decision-making
- tailoring interventions aligning with the patient's goals and motivations
- led and implemented through an MDT
- psychological and behavioural support, addressing e.g. fear of movement, self-efficacy, self-management
- including aspects relevant to each patient e.g. weight loss support, nutritional guidance, medication review
- flexible delivery to adapt to patient's needs, preferences and circumstances
- addressing potential barriers for each patient
- including supervision/accountability and communication
- including activity to support long-term maintenance and maximising of benefits

Practical examples that do not support behaviour change

- overreliance on information provision without behavioural or follow-up support
- insufficient ongoing support after the initial intervention phase
- weak integration with routine care
- not tailoring programmes to patient preferences
- unclear structure and vague advice and expectations

5. Types of preventative interventions

This section describes the four types of interventions found within the literature. Within each one there is discussion of:

- what the intervention involves
- what the benefits are
- how this might impact service use
- what needs to be considered with regards to supporting engagement with the intervention
- what needs to be considered with regards to decision making to direct people towards the intervention

5.1 Pre-symptomatic – Targeted public health messaging

Primary prevention support targeted in communities with a high risk of developing MSK conditions.

What people experience at this point

- People are pre-symptomatic but there are environmental risk factors that can increase the likelihood of developing MSK related conditions.
- These factors include:
 - Inactivity
 - Unhealthy weight
 - Living in an area of high multiple-deprivation
 - Co-morbidities including diabetes
 - There is disproportionate prevalence among black, Asian and minority ethnic groups
 - Going through pre-menopause
 - Those in jobs involving manual labour

Where people might present and who is involved

- Manual workers may present to their occupational health
- Present to their gym/fitness trainer/ private Physio / masseuse – looking to relieve initial bout of ‘runners knee / old injury flair’
- They often do not present at all and will self manage with OTC medication, rest, topical creams and self massage and continue with their activity as this tends to settle within 1 -3 weeks.

Challenges at this point

- Inconsistent access to high-quality evidence based exercise and weight management programmes in the community -
- Behavioural / Social barriers – Public narrative of OA as ‘wear and tear’ or just aging undermines prevention messaging.
- Weight management, and physical activity or occupational load are socially and economically constrained as people may not have safe spaces, time, money to seek guidance, take off work to see GP, go to gym, lack of data to access online resources etc.

5.1.1 Interventions

Primary prevention health messaging in specific communities, working with grassroots organisations who have strong links with communities where there are high MSK related health inequalities. Effective messaging emphasises:

Everyday movement and physical activity – promoting regular movement as part of daily life, with reassurance that small amounts count and activities can be adapted for different ages, abilities and pain levels.

Strength, mobility and joint confidence – simple messages on maintaining muscle strength, flexibility and balance to protect joints, reduce pain and support independence across the life course.

Early self-management and help-seeking – encouraging people to respond early to aches, stiffness or pain, with clear guidance on safe movement, pacing, and when to seek advice.

Wider factors affecting MSK health – linking MSK wellbeing to healthy weight, good sleep, mental wellbeing, safe working practices and physically demanding roles such as manual work or caring.

Practical, realistic actions – focusing on achievable steps within the realities of people’s work, environment, culture and socioeconomic circumstances, using non-judgemental, strength-based language.

Benefits

- Improving overall health lowers the risk of developing MSK related conditions
- Public health messaging has been shown to reduce prevalence of lower back pain.
- Increased health literacy and understanding of early symptoms results in better engagement with services.

5.1.2 Supporting engagement with the intervention

Primary prevention MSK health messaging would be co-designed and delivered with grassroots organisations that have trusted relationships with communities experiencing high MSK-related health inequalities. Working alongside community leaders and local advocates, messages would be culturally relevant, accessible and practical, focusing on prevention through physical activity, strength, mobility, healthy weight and early self-management.

Delivery would use trusted community settings and channels—such as community centres, workplaces, faith groups and local events—supported by peer champions and locally tailored materials. Grassroots partners would be resourced to sustain engagement, while ongoing feedback and simple outcome measures would be used to refine messaging, improve reach and help reduce MSK inequalities in a meaningful and lasting way.

5.1.3 Decision making to direct people to preventative interventions

For those engaged with other specialist health services due to an existing condition such as cancer treatment and diabetes, and those experiencing pre-menopause, there is a role for healthcare providers to deliver prevention messaging. This will require support to staff delivering messages so that they feel confident spotting the signs of particular risks, and feel confident in speaking with people about potential prevention approaches.

5.2 Early symptom development - Structured community based interventions

What people experience at this point

- People now notice symptoms, but not yet surgical candidates.
- Activity related knee pain, pain on walking, stairs, squatting, kneeling, often eases with rest
- Short lived stiffness but more mornings than before – lasting 30 minutes and eases with movement
- Difficulty walking a distance, reduced pace walking, getting up from a chair can be bothersome
- Swelling and puffiness or episodic effusion after heavier use more common
- Noises (crepitus) and sense of grinding or roughness more audible, and more worrisome for patients
- Still fluctuating good and bad days but more bad days than before especially with activity or load.
- Larger reliance on short term painkillers (paracetamol, nsoids) still without structured plan for exercise weight management or load management (podiatry / orthotics/ exercise specialist)
- Clinically this group is described in NICE as over 45 years, activity related pain, short morning stiffness and often diagnosable without imaging.

Where people might present and who is involved

- Mostly now at GP practice for GP/ANP/FCP
- Still mostly coded as knee pain instead of OA, more likely to make OA diagnosis based on how often symptoms present and age.
- Framed as mechanical knee pain, referrals to MSK groups and self management strategies more common in this group – more targeted prevention rather than universal messaging.
- Use of Digital Apps and online resources more used now as people self-recognise a 'problem' knee / hip
- Younger more active will visit private masseuse, Physio, fitness etc – gap in economical availability of these services.

Challenges at this point

- Still low numbers reaching weight management and activity as core treatment due to lack of access /knowledge of the importance of these- pain with walking increase belief that more walking may cause damage – in clinical practice most people just want to hear that they can go on it will not make OA worse.
- Limited information on OTC medication on long term use risk-benefit for each patient
- Pain relief can also mask the issue and carry on, rather than understanding pathology and graded activity and strengthening strategies that will support the joint
- Late and inconsistent referrals in the space more evident – depends on age (knees only last 15 years – so we try and manage conservatively until at least 60 years of age – but this for some individuals can be really traumatic and problematic) - imaging is interpreted as mild-moderate. Or moderate to severe – no specific guideline on the classification leading to personal interpretation and management.
- Socially now more seen as just 'wear and tear' reducing the belief that prevention or modification is needed.
- Pain, low mood, fear of damage further reduces activity and driving de-conditioning

5.2.1 Interventions

Core things that work in early symptomatic osteoarthritis are education, exercise therapy, weight management. These should be consistently recommended as first line to achieve with small moderate improvements in pain and function.

Early identification matters as it can this leads to targeted programs with education, exercise and weight management which could substantially reduce long term burden.

These are a mix of self-directed and led walking/low-intensity exercise sessions. They are aimed at people with self-reported joint-pain and stiffness. Examples include:

- Arthritis Foundation's 'Walk with Ease' - Self-Directed or Guided Programme to Support Physical Activity, a community-based walking programme. Group (3 times weekly for 1 hour for 6 weeks) or self-guided with a booklet. The booklet has exercise and lifestyle recommendations plus walking programme
- Active Living Every Day - 20-weekly group sessions, behavioural therapy-based physical activity programme. Intervention teaches people the cognitive/behavioural skills to become and stay physically active. All receive the manual and a pedometer. Supported by online material.
- Community Walking Programme - Walking. Provision of pedometer and log book. Weekly walking sessions over 12 months. Intervention group also received 20 weekly sessions of a Behavioural intervention with goal setting and advice, then 6-monthly meetings and 12 weeks of telephone support.
- ESCAPE-pain - 12 supervised sessions (twice weekly for 6 weeks). Education on selfmanagement with an individualised progressive exercise programme.
- Good Life - 2 sessions of PT-delivered Information, if available 1 additional session with "expert patient" and dietician, supported self-management, physical activity recommendations.

Benefits

These interventions show a positive impact on:

- Levels of pain and therefore interactions with pharmacy/GP
- Mobility and joint strength
- Reducing the risk of fractures
- Maintaining good bone health for those at risk of frailty
- Levels of confidence and self-efficacy which is shown to support long-term self-management
- Related low-mood and/or social isolation

Evidence shows that there is little difference in outcomes between self-directed and group sessions. However, those in self-directed regimes show a greater adherence exercise programmes after 12 months.

Impact on downstream service utilisation

- This can have a positive impact on the 33% of the adult population in Scotland who experience MSK related pain. It can be delivered at scale with targeted investment into place-based assets.
- It can prevent development of long-term MSK conditions, as currently 33% of people with a long-term MSK condition report inactivity.
- There is likely to be less reliance on primary care services and diagnostic imaging.

- Strength-based interventions most beneficial to those already at a healthy weight so likely impact to be around preventing frailty related interventions downstream
- Preventing fractures can reduce utilisation of minor injuries units and imaging.

5.2.2 Supporting engagement with the intervention

Engagement with interventions at this level is variable. There are motivational challenges due to lack of clear diagnosis and immediate significant impairment to daily living. From the interventions reviewed that described how they engaged people, there is general consensus that the following increased engagement in recommended activity:

- Initial face-to-face interaction with an authority figure to explain the benefits and potential risks of doing nothing
- Dialogue around the options available and a sense of ‘contracting’ around what the person wants to do, what they see as realistic and what they want to achieve

There is also a challenge within this cohort in thinking that exercise might exacerbate pain. Evidence shows that advice given by trusted clinicians such as those in Primary Care is more effective than generalised information given online, through charities or pharmacy staff. [The Faculty of Sport and Exercise Medicine UK has produced a number of ‘Impact Statements’](#) to support the communication of key messages by clinicians in response to people’s hesitancy to undertake exercise.

5.2.3 Decision making to direct people to preventative interventions

As symptoms start to emerge, people can start to be put on clinically-led pathways that emphasise medication based pain management, and moderate threshold physiotherapy support. There is signposting to structured exercise/lifestyle resources, however, the impact of this can be limited if not specifically engaged with as part of a clear plan of care. Screening has been shown to support this.

Education of clinicians also plays a part in this with regards to ensuring they are having the right conversations with people about their issues and what outcomes they are seeking. Moving Medicine have ‘Consultation Guides’ for supporting clinical staff to get better information from people and make more informed, collaborative decisions.

5.3. Individualised interventions for established MSK symptoms

What people experience at this point

- Clear persistent symptoms with functional impact, but not all will meet surgical threshold
- Pain
 - persistent or recurrent, lasting weeks or months
 - can be worse at the end of the day and wake you up at night and disturb sleep, especially after heavy use
 - gets worse with movement, loading, or specific activities, and may worsen with rest

- can be localised or include referred pain, with variable intensity and/or intermittent flares
- may be predictable, triggered by specific activities e.g. walking, stairs, squatting, kneeling
- Stiffness and reduced mobility
 - In the morning or after rest, lasts less than 30 minutes but is more noticeable and more frequent or constant
 - Reduced range of movement, often asymmetrical, may feel blocked or restricted
- Functional limitation
 - More noticeable than before
 - Difficulty with everyday activities, e.g. walking, climbing stairs, dressing, reaching, standing or sitting for prolonged periods
 - Task modification or avoidance, e.g. changes in how they do activities, avoiding physical activity
 - Work-related impact, e.g. recurrent absences, reduced capacity
- Visible or felt swelling, “puffiness” more common, sometimes with warmth from the joint
- Mechanical symptoms more common e.g. crepitus, grinding, catching, sense of giving way

Where people might present and who is involved

- Recurrent attendance at GP practices:
 - diagnosis or reassurance
 - referral, imaging or medication
 - help managing symptoms and their impact
 - repeat prescriptions
 - “is it time for surgery?”
- Self-referral to community MSK and physiotherapy services, especially where they might have benefitted from physio before and they are seeking continuing care
- Community pharmacy for self-management support, e.g. pain management advice and over-the-counter medication
- Occupational Health services, due to absences, reduced work performance or need for workplace adjustments
- Secondary care referrals, if previous conservative management has failed. Most likely to be referred for imaging, diagnostic confirmation or surgical opinion; still most told symptoms don’t meet surgical threshold.
- Urgent and unscheduled care e.g. A&E or 111, due to acute flare ups, sudden functional loss or heightened anxiety about symptoms
- Non-NHS routes in parallel or instead of NHS care, such as private physiotherapists, osteopaths or chiropractors, exercise professionals

Challenges at this point

- Persistent impact on daily life
- Belief that ‘only a new knee’ is the solution
- Expectations for the use of imaging, even though x-ray doesn’t always support person-centred care and addressing symptoms
- getting moved between services a lot, e.g. from GP, to Physio, to orthopaedics and then back to physio and GP again. Linked with inconsistent thresholds between boards and surgeons, can lead to inequality of care
- Difficulty sustaining exercise due to ongoing pain and dysfunction with increased aging, frailty and co-morbidities. Pain, fatigue, low mood limits adherence.
- Escalating reliance on medication e.g. NSAIDs, paracetamol and now opioids (often without structured review), and long term use of opioids
- Socioeconomic and geographic barriers limit access to interventions and impact adherence and outcomes e.g. travel, cost, time of work, rurality
- Patients experience frustration or demoralisation due to symptoms persisting and fear of movement or re-injury, loss of confidence in movement

5.3.1 Interventions

Core non-surgical treatment remains the first line treatment for established MSK symptoms. These are targeted interventions enabling personalized management of problem areas through first access triage and MDT management. Programmes are structured but tailored to the patient’s needs, and can include education, exercise therapy, and weight management. A prevention-focused MSK MDT ensures effective case coordination and integration with routine care, creating a care plan with each patient, led by physiotherapists with input from health psychologists, and rehabilitations teams, digital health support, dietitians/nutritionists and weight loss support.

To ensure support is targeted, accessible and with increased adherence and benefits, options offered to patients should include a mix of activities, physical as well as educational and addressing psychological aspects. Options should be varied:

- structured or flexible
- self-guided or supervised
- group-based or individual
- scheduled or on-demand
- in person or digital/online, and
- taking place in local community settings or at home.

Different approaches to targeted interventions, which can be delivered independently or alongside, are outlined below.

5.3.1.1 Coached physiotherapy targeted at problem area

This type of intervention adopts a holistic approach, combining tailored physiotherapy and rehabilitation with precise health management, education and information, and real-time

monitoring and tracking. Programmes are personalised and provide different activity options to align with patients' needs, preferences and contexts. Certain targeted physiotherapy can show benefits from the first session, but it is important to support maintaining benefits, for example through follow-ups or booster sessions. An example of this approach could include:

- Education: On-site education and information to strengthen management awareness. This could use digital platforms, regular lectures, and home education sessions, alongside comprehensive guidance on health knowledge, diet, exercise, medication, psychological aspects, fall prevention
- Monitoring: Remote real-time monitoring involving tracking diet, exercise, physiological indicators, and medication adherence through health management software and continuously updated wearable devices
- Physiotherapy: Training duration, intensity and frequency is be adjusted based on patient's endurance level and preferences.
- Structured exercise programmes that might take place over a set period of time approximately 150 minutes per week that combines aerobic and strength based exercise, along with balance and general walking.

Benefits

This type of intervention can show a positive impact in the following ways:

- More effective than usual care in reducing pain, enhancing self-management and improving bone health
- Can support improvement in function comparable to surgical interventions
- Improvement in pain and physical function, especially for those who are most affected
- Increased involvement in self-management
- Accessible approach supports ongoing self-efficacy
- Equal benefits from different types of physiotherapy e.g. heat therapy, ultrasound therapy, electrical stimulation, so different options can be made available to align with patients' preferences and increase adherence and patient satisfaction
- Certain modes of physiotherapy can have benefits from the 1st session

Impact on downstream service utilisation

- This could lead to less reliance on pain relief, avoiding risks of overmedication
- Increased adherence leads to increased benefits and self-management, which could mean less need for further support from services
- Can have fast short-term benefits, as well as sustained longer-term benefits, supporting both to decrease immediate demand and demand in future further down the line
- One first contact triage programme reduced surgical conversion rates, making a cost saving of 19% in surgical procedures compared to a GP-first model.

- One strength-based intervention reduced the number of people progressing to surgery to 10%.
- The 'Best in Class' MDT programme reduced the number of people referred from primary care to orthopaedic services to 3%.

5.1.1.2 Telehealth exercise

Telehealth exercise interventions support the comprehensive management of conditions. They should be multifaceted and include elements that improve self-efficacy for symptom management, fear of movement and weight loss where appropriate. They should be structured and progressive (not unsupervised home exercise programmes), including regular reminders.

An example of a telehealth programme including diet could include:

- Physiotherapy and exercise delivered through:
 - Video consultations with a physical therapist over 6 months
 - Video interview to review exercises and answer questions
 - Weekly exercise diary, to be completed and submitted via whatsapp
 - Hard copy information booklets e.g. exercise instructions, logbook
 - providing an exercise band and fitbit to monitor physical activity
- Diet:
 - Video consultations with a dietitian over 6 months
 - Weight management booklets and guides for recipes and weight management activities
 - Providing a plastic portion plate
- Self-efficacy aspects: pain coping skills training, self-management education, and education and information about the condition using empowerment and participatory discourse rather than focusing on disease and impairment. Information shared over online video and whatsapp.

Benefits

This type of intervention can show a positive impact in the following ways:

- Increased benefits compared to unsupervised home exercise programmes
- Improved core endurance and strength, preventing exacerbation of musculoskeletal issues
- improved adherence and exercise practice through structured and progressive interventions alongside regular reminders
- Increased self-efficacy for symptom management and decreased fear of movement, leading to less severe pain, better function and health status
- Increased unwillingness for surgery

Impact on downstream service utilisation

- Improved self-management and increased independence can delay need for medication or further support

- Where appropriate, interventions can be delivered digitally, decreasing reliance on in-person elements
- Decreased impact due to risks linked to obesity

5. 3.2 Engagement good practice

Engagement with interventions can be variable, and there are elements and forms of delivery that support increased adherence. Motivational challenges can be due to personal barriers and the impact of established symptoms. From the interventions reviewed that described how they engaged people, there is general consensus that the following increased engagement in recommended activity:

Personalisation - Interventions should be tailored to pain severity, functional ability, personal goals and individual context. Practical enablers such as equipment, hard-copy materials or transport should be addressed early to reduce barriers. Involvement of family members or carers can further support confidence and adherence.

Flexibility - Delivery models should combine scheduled sessions with on-demand options to reflect differing needs and circumstances. Programmes should be available in accessible community settings and at home. Digital and remote delivery can improve access, but must be designed to minimise digital exclusion and inequalities.

Professional and Multidisciplinary Support -Consistent professional input is essential for supervision, education and continuity of care. Physiotherapists should act as core providers, with access to wider multidisciplinary support such as dietetic or pharmacy input. Tailored or more intensive support should be available for individuals with low engagement, low health literacy, fear of movement or complex needs.

Psychosocial Support - Programmes should address behavioural and psychosocial factors, including motivation, self-efficacy and beliefs about pain and movement. Education should prioritise understanding and confidence rather than instruction alone. Motivational interviewing can help challenge self-limiting beliefs and support sustainable behaviour change.

5.3.3 Supporting decision making

Multi-disciplinary working to identify a range of intervention options that are most suitable for each patient and available to them supports engagement with non-surgical treatment.

Having first contact triage or physiotherapy ensures that people are able to quickly access non-clinical support, before medication and imaging reinforces a clinical direction of travel for treatment.

Patient Reported Outcome Measures are an effective method for tracking progress in a way that emphasises personal outcomes rather than mechanical joint outcomes which is shown to induce demand on specialist services. This can help shared decision making through focussing on:

5. What could happen if they “do nothing” or continue current approach e.g. reliance on medication
6. available options and potential outcomes, including what elements are included in each intervention, how they will be delivered and by whom
7. patient motivations and goals
8. realistic look at potential outcomes from chosen treatment

5.4 Advanced MSK need where surgical interventions are being considered

What people experience at this point

- People have clear persistent OA symptoms with functional impact, but not all with yet meet surgical threshold
- There is pain in walking, going upstairs, squatting and kneeling
- Pain is often worse at the end of the day and can disturb sleep.
- Morning or post-rest stiffness, less than 30 minutes but rated as ‘frequent to always’.
- There is visible or felt swelling.
- Reduced range of motion as joint feels blocked or restricted.
- Mechanical symptoms are prevalent, with people reporting grinding, catching and a sense of the joint ‘giving way’
- Swelling and puffiness or episodic effusion after heavier use more common
- Work capacity can be affected.

Where people might present and who is involved

- Recurrent attendance at GP practices for pain, function loss and repeat prescriptions.
- Self referral to Community MSK hubs / physiotherapy or referred for structured exercise, education and self-management. Some have had multiple physio episodes.
- Likely referrals for imaging, diagnostic confirmation or surgical opinion – though often not deemed bad enough in most cases.

Challenges at this point

- There are high levels of surgical regret or unmet expectations with regards to the benefits of surgery.
- A study in England found that 21% of people found that their primary hip replacement had worsened their symptoms (would equate to 1096 surgeries based on 2024 Scottish figures).

5.1 Interventions

When surgical interventions become an option, there are still opportunities to divert people away from surgery in a way that can help people achieve positive outcomes, as well as reduce demand on planned orthopaedic care. Evidence identifies clear benefits in intensive 'pre-habilitation' programmes that can give people what they need with regards to reduced pain and improved function. This needs to be supported by good conversations with people about what they can expect from surgery and what they want to achieve through it.

Prehabilitation is about increasing functional capacity and overall health prior to surgery with the aim of improving surgical outcomes and lower post-operative complication rates. Prehabilitation programmes are delivered preoperatively by a multi-disciplinary team and in various settings (e.g. inpatient, outpatient, or at home). Typical activities include exercise training, promotion of physical activity, improving diet and psychological support. These interventions are delivered by rehabilitation practitioners.

Benefits

- Along with supporting surgical outcomes, there is good evidence to suggest that pre-habilitation can achieve the outcomes that people expect from surgery with regards to function.
- By experiencing functional improvement through pre-habilitation, individuals are better able to make informed choices about surgery based on outcomes that matter most to them.

Impact on downstream service utilisation

- From a cost perspective, programmes such of these demonstrate cost-effectiveness with regards to:
 - Managing demand on surgical resources as people are able to wait longer with less deterioration
 - Decreasing post-surgical complications and the need for secondary surgery
- There is emerging evidence that people are choosing to postpone or avoid surgery entirely following a pre-habilitation intervention.
- One pilot programme noted an increase to 15% of people not proceeding to surgery after an intensive pre-habilitation course.

5.2 Supporting engagement with the intervention

- Personalise rehabilitation to individual goals, abilities, health conditions and daily routines; standardised programmes reduce engagement, especially for frail older adults
- Build strong, supportive relationships with healthcare professionals; listening, reassurance and personalised advice significantly encourage participation

- Explain the purpose clearly and simply, linking rehabilitation activities to outcomes that matter to the person (e.g. recovery, independence, confidence)
- Support confidence and self-efficacy by setting achievable tasks, recognising progress, and providing positive feedback
- Address beliefs and motivation explicitly, including fears, low expectations, or fixed views about ageing and capability

5.3 Decision making to direct people to preventative interventions

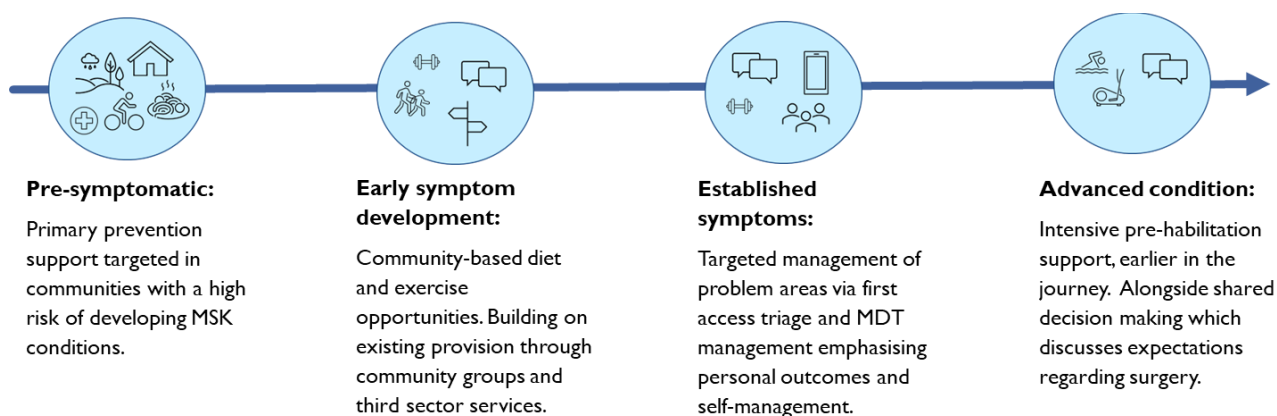
For this to be an effective method for reducing the number of people moving onto surgery, there needs to be clear points to review progress and reappraise surgical options. Good practice evidence outlines the need for an emphasis on shared decision making, with conversations between clinicians and people covering:

- What surgery can be expected to achieve
- What a person is wanting from the surgery
- How non-surgical approaches might support people to achieve what they want

Tools and approaches such as Patient Reported Outcome Measures can help support these conversations, and build a wider evidence base on which to draw upon. They can highlight how different approaches have impacted people.

6. Conclusion and next steps

This report has mapped out evidence-based prevention interventions based on four stage model.



Discussion of the evidence points to some core components across these stages relating to:

- rapid-access MSK triage led by AHPs and first contact practitioners
- multidisciplinary team management based in primary care, with physiotherapy, joint pain practitioners, dietitians and others
- behaviourally informed physical activity programmes addressing pain beliefs
- digitally supported self-management
- community-based group delivery models to increase reach and reduce cost
- ‘waiting well’ support to reduce risks of deterioration of conditions
- robust ‘pre-habilitation’ services that can help people reconsider the need for elective surgery
- use of Patient Reported Outcome Measures (PROMS) to enhance shared decision making

6.1 Discussion

This evidence review identifies multiple examples of effective practice in managing demand for specialist services. However, the evidence strongly indicates that the greatest benefits are achieved when these approaches are integrated into a single, coherent model rather than implemented in isolation.

Strongest evidence suggests potential significant demand reduction for orthopaedic services by looking at interventions linked to:

Structured community activities

There is substantial scope to increase physical activity, which has a strong impact on MSK outcomes, but many people still require supported entry and continuation. Structured exercise programmes that are coached, scalable, and low cost can be effective, provided they include a clear behavioural change element. In more deprived communities, these approaches are most

effective when delivered with a relational, non-judgemental model of support to address low health literacy and mistrust.

Physio-led MDT support

While standardised programmes work for many, they may not be sufficient for people with worsening or more complex conditions. Physio-led MDT support provides essential safety and responsiveness through rapid access to assessment, targeted interventions, and condition-specific self-management, enabling timely escalation without defaulting to more intensive care.

Pre-habilitation / Waiting well

Early conservative management between symptom onset and advanced disease is clinically effective and cost-effective. Pre-habilitation and waiting-well approaches use structured exercise and self-management support to stabilise or improve symptoms while people await further care, with relational support particularly important for sustained engagement in underserved populations.

Which will be enabled by:

First contact triage - evidence shows benefits of having first contact triage points where MSK specialists are able to work with individuals to understand the severity of their need and provide value based proportionate support this does not have to sit within the GP locus of care. Evidence shows community-based multidisciplinary teams and links with grassroots activity programmes can have a significant impact on people's overall health and outcomes.

Shared decision-making - there needs to be a multidisciplinary approach to understanding can needs and the most effective course of action. This includes working with people around shared decision-making and having clear understanding of what people want to achieve from support this may be centred within personal outcomes or goals where people have differing priorities with regards to pain versus function versus treatment intensity.

6.2 Next steps

We will use this evidence to model likely scales of investment and impact regarding preventative interventions to inform planning.

What we want to do - We want to understand how much demand we can expect to be taken out of the system at the different points along the pathway, what invest might be required for that, and what saving that will result in. This includes a realistic look at how we balance savings through decreased service utilisation; savings that are 'cashable' – i.e. taken out of budgets. And what the mechanisms for this might be.

Where we want to focus - Due to the high pressure currently on orthopaedic services, we will focus on the interventions highlighted to have a more immediate impact on demand. These will be those that sit closer to the acute end of the pathway but still aim to 'shift left' with regards to avoiding the use of orthopaedic services, and ultimately surgical interventions.

How we will start - There will be some dedicated work in Forth Valley utilising local data and costings around demand and interventions. Additionally a workshop on the 19th May will allow for discussion relating to best practice, identifying our knowledge gaps, and refining our model.

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