

A population healthcare approach to planned care orthopaedics

Population Health Insights Collaborative

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1.Introduction

In Scotland there are 54,321 people with an ongoing Orthopaedic wait of which 1803 have been waiting over 52 weeks. ['new outpatients' - i.e. the first consultation with an orthopaedic specialist.] There is a Ministerial Mandate to achieve the treatment time guarantee provided for in the Patient Rights (Scotland) Act 2011 and the Patient Rights (Treatment Time Guarantee) (Scotland) Regulations 2012 will be met in respect of all patients requiring orthopaedic elective care services by March 2029.

To support sub-national planning population health, a collaboration of CFSD, DoPH, HIS, PHS, PSDS, clinical and operational leaders from across Territorial Boards have been working on a population health approach to reduce waiting times. Two areas for work were agreed as priority areas for working on collaboratively

1. Reducing new referrals through prevention intervention mapping
2. Optimise outcomes through prehabilitation for those on the waiting list.

This paper outlines the work on *Aim 1 reducing referral through prevention mapping* from this collaboration and makes recommendations to for Subnational Planning

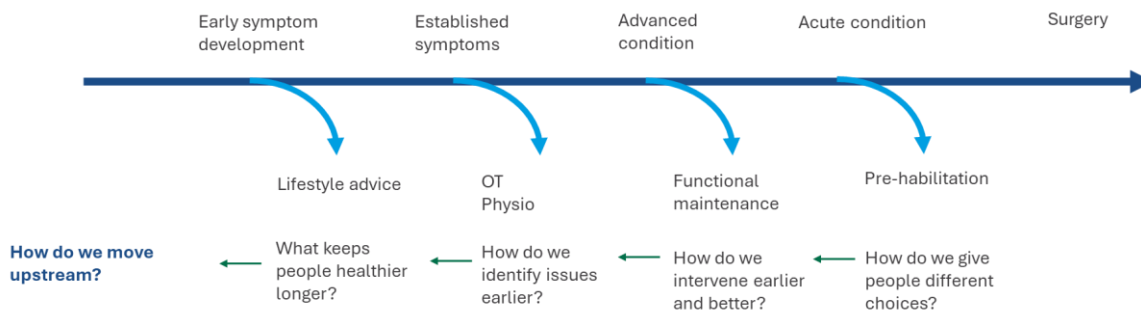
The models support NHS Scotland's ambition to become a **Population Health Organisation (PHO)** by embedding population need, primary and community health, and future demand into planning and service redesign. It promotes whole-system collaboration, a shift from reactive treatment focussed to prevention-led, outcome-focused and Value-Based decisions and combines clinical intervention, behaviour change, and community-based support. It enables a consistent approach based on evidence and small initiatives across Scotland.

2.Reducing new referrals

To complement ongoing work to tackle existing waiting lists and reduce waiting times for orthopaedics, we undertook an evidence review to understand where upstream investment can have a high impact on reducing the number of people being added to waiting lists. In order to ensure the sustainability of current improvement efforts on reducing waiting lists, it will be essential to reduce overall demand for specialist orthopaedic services.

Looking at waiting lists and high orthopaedic demand from a population health perspective, there are significant benefits to short and medium term (6-12 months) challenges through taking this approach.

The starting point was to think about the stages of hip and knee osteoarthritis along a deterioration pathway towards joint replacement, and how we might intervene and shift the course of that journey at each point.



Here, we outline the impact that a population health approach to orthopaedic services might have on system demand. It sets out what services and service utilisation might look like starting from the point of what matters to people and getting people to the right support at the right time.

With regards to implementation, prevention pathways can build on existing programmes and infrastructure, with investment aimed at increasing capacity and supporting change. The model brings together evidence and existing practice from across different Health Boards and Health and Social Care Partnerships, to support decision making in planning at Sub National and Board level.

The scope of this work is around prevention, community support and ways to reduce surgical/acute demand. There is a range of work currently being undertaken regarding inpatient processes, flow, acute safety, and recovery. This is an essential part of building safe care for people who require this type of support, and a key part of the journey. It is therefore complementary to this but still sits outside of the scope.

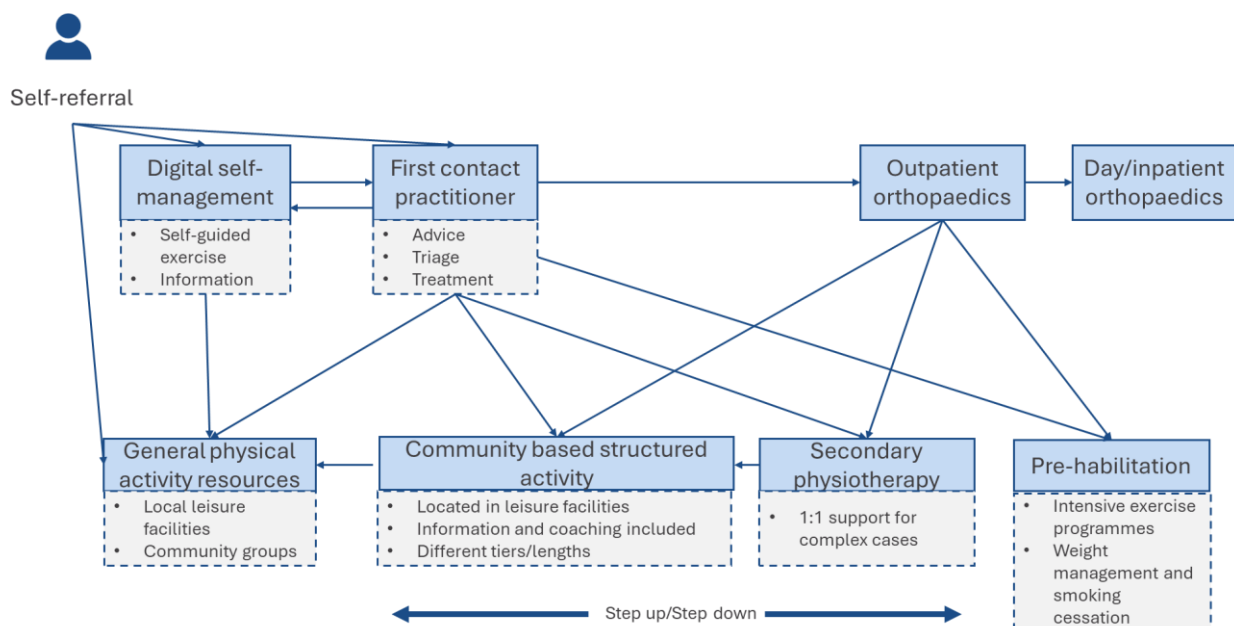
3.Outlining the model

The below shows a population health-based model for supporting people with common MSK symptoms linked to hip and knees. It shows how conservative management of symptoms can shift demand across the system, reduce costs and waiting times. Central to the model is the idea that at each stage there is:

- Preventative interventions as an alternative to traditional clinical pathways
- Mechanisms for rapid triage to direct people to the right type of care
- Support for people to engage with preventative activity in a sustainable way

The model has been developed through piecing together evidence-based practice already being undertaken across the country. Much of the impact and costings noted have been based on evaluations and data from these innovations.

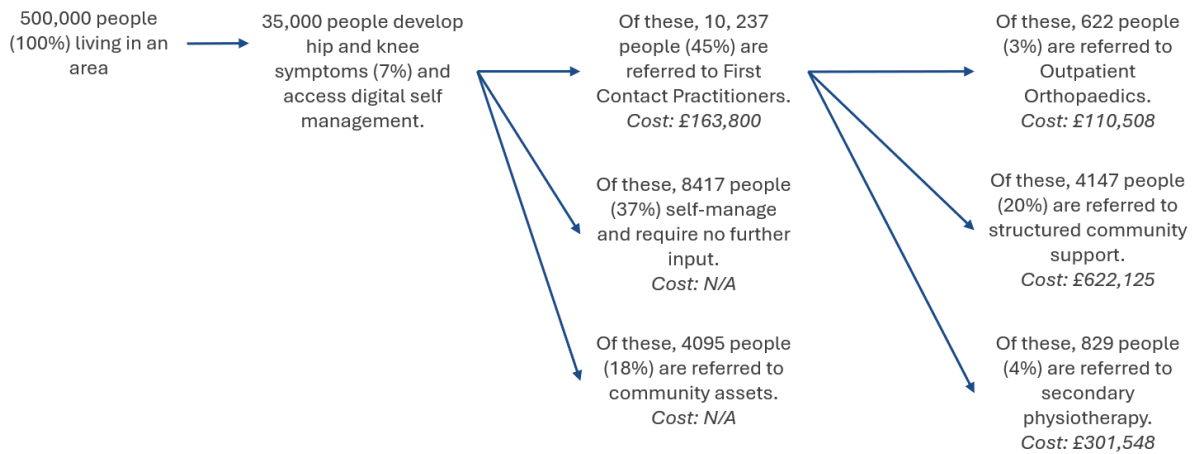
Broadly, the model involves:



Based on costings from existing practice, and a hip and knee symptom prevalence rate of 7%, a **Health Board with a population of 500,000 (supporting 35,000 people with hip and knee issues) can run this model on approximately £1,397,981.** This figure does not include any surgery still required or prehabilitation (yet to be costed). However, it does include full coverage of prevalence (as opposed to those who present with symptoms).

Flow through the model

Following the flow of the 35,000 people through this model we can identify how many people are being supported at each point, and the likely cost.



The below outlines an ideal prevention embedded model of care that will deliver considerable financial savings as well as decreasing waiting lists. Boards will have different baseline configurations of existing services as a starting point which can be compared to the ‘population healthcare model’ described here. We have not considered the ‘General physical activity resources’ and ‘Secondary physiotherapy’ elements of the proposed model.

While the impact noted below is represented as financial savings, the interventions also represent improved outcomes for people and their wellbeing. In line with population health approaches, this model delivers care closer to home, supports choice and control, and prevents conditions getting worse, reducing associated impact on people’s ability to work and live their lives how they would like. The methodology behind the impact analysis for all components of the model is in Appendix 1.

Digital self-management

A digital tool for individuals to access which supports triage into the most appropriate services and provides personalised self-management information such as structured exercise, stretching and diet support. The Phio App is being used in seven Scottish health boards, to different extents. The below is based on findings from NHS Borders.

The impact

- 27% of people are able to self-manage through the app and not require additional input from statutory services.¹ In the Borders, the cost of this cohort of people being seen in secondary physio services would have been **£74,896**.
- 18% of people are referred to local community support, reducing unnecessary clinical time.²

¹ Findings from NHS Borders use of the Phio digital application

² Findings from NHS Borders use of the Phio digital application

The cost

- The app costs £0.40
- The app is costed for the total population of an area, so for a population of 500,000 it would cost £200,000

First contact practitioner³

An allied healthcare professional who is able to be accessed quickly as a first point of contact when people's symptoms start to emerge. Their role is to provide initial assessment and treatment, support self-management and provide referrals into other services if required.

This is currently delivered by Band 7 physiotherapists within a GP practice. However, alternative delivery models using band 6 AHPs and use of Community Appointment Days are also beneficial.

The below is has been modelled on a number of evaluations..

The impact

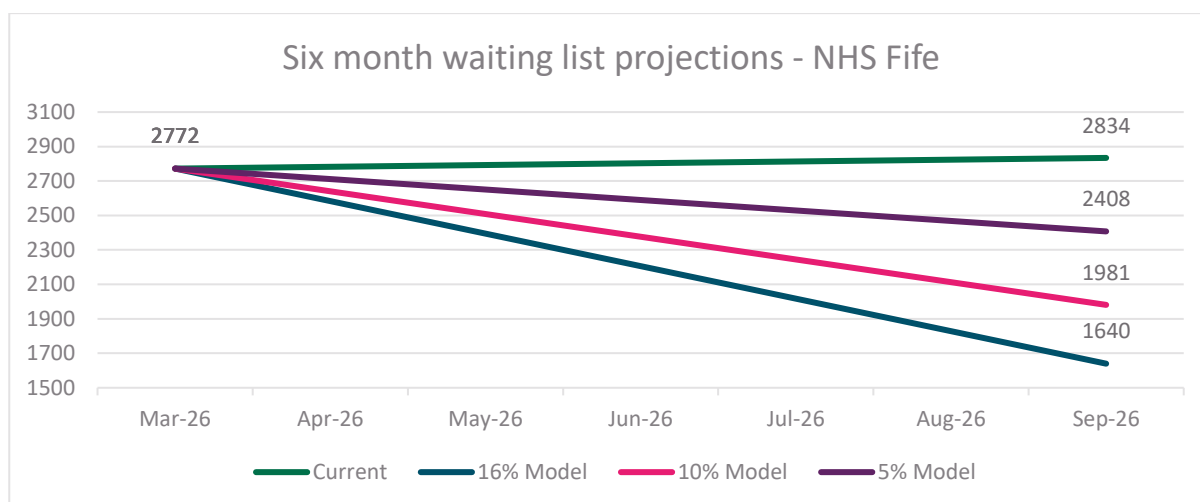
- Using a AHP results in a 16% reduction in referrals to Outpatient Orthopaedics from Primary Care.⁴ This has an immediate impact on reducing waiting lists. Below is indicative modelling based on Fife⁵:

Projected waiting list in 6 months	Over capacity by	Potential waiting list in 6 months with intervention	Total reduction in waiting list	Additional capacity
4265	0.7%	1638	43%	14%

³ There are a number of titles used for this role, most commonly in Scotland this is 'Advanced Practice Physiotherapy'. The phrase First Contact Practitioner is used here to highlight that there can be flexibility in the specifics of the role and delivery mechanism if required.

⁴ The figure of 16% is the average of reductions found within practices utilising First Contact Practitioners

⁵ Included in this is projections for a 10% reduction in referrals (noting sub-optimal implementation) and a 5% reduction (noting poor implementation).



- In this case a reduction of 16% in orthopaedic outpatients appointments (11928) would be 1,908 appointments in a year, at a cost of £223,292
- Band 7 First Contact Practitioners are able to provide joint injections within Primary Care. In Forth Valley In 2025-26 there were 677 injections for knee osteoarthritis. Costings and savings on table below compared to Secondary Care costing:

Year	Total No. of APP Knee Injections	Approx Secondary Care cost	Approx APP cost	Approx saving to Health Board
2025-26	677	£153,679	£13,587	£140,092

- This model also reduces demand on diagnostic imaging, with some studies showing a 19% decrease in usage of imaging by Primary Care.⁶
- Alternative delivery models for first contact support are community appointment days which have been shown to have positive impacts on waiting lists. A Community Appointment Day pilot for MSK in Grampian saw length of wait for orthopaedics fall from 120 days to 43 days; and the proportion of new referrals seen within 28 days increased from 50% to 83%.

The cost

Based on available data from evaluated models, a staff to population ratio can be expected to be:

Advance Practice Physio	Person with MSK symptoms
1	0.00021

⁶ [Unintended consequences: quantifying the benefits, iatrogenic harms and downstream cascade costs of musculoskeletal MRI in UK primary care](#)

A UK wide MSK health profile noted that 17.9% of people report a long-term MSK symptoms.⁷

Using this to model the population within East and West subnational regions we can estimate the following staffing requirements:

East	West
93.2 WTE	115.3 WTE

This equates to **0.15%** of the current workforce. And it must be considered against recent Public Health Scotland publications that shows MSK as representing **7%** of the burden of disease.

With regards to costing, using the same methodology as above the **cost per person is £16.08**.

Community based structured programmes

A tiered offering of community programmes which centre on exercise, self-management and wrap-around AHP support. It includes structured classes in the community, dietetics, lifestyle and weight management support (which may include GLP-1 use, though more evidence and consideration is required), information sessions and peer support. These are tailored to each person. They provide an alternative to clinical pathways, much of the reduction in demand noted above is due to the availability of these programmes.

The impact

- The Forth Valley based 'Best in Class' programme oversaw a 12% decrease in secondary physiotherapy referrals in one locality over the two years of the programme, due to the ability to offer community based, structured exercise support.
- This amounts to £105,569 if projected across the whole health board (£20,721 in pilot area).

The cost

- Structured exercise programmes can typically cost around £150 per person, which would equate to £622,125 modelling for a population of 500,000
- Full wrap-around support (a lot of which can be provided within current capacity with regards to dietetics and other AHP services) has been costed at £300 per person, modelled to £1,244,250.
- It is important to note that at this community level, these programmes are not condition specific (i.e. hip and knee osteoarthritis) and therefore have significant benefits for people

⁷ <https://www.gov.uk/government/statistics/musculoskeletal-health-profile-april-2025-update/musculoskeletal-health-profile-statistical-commentary-april-2025>

with frailty and reducing costs associated with falls such as ED attendance, home adaptations and social care.

Prehabilitation

Pre-habilitation activities include strength training, functional training, aerobic exercises, diet/alcohol/smoking support and psychological support. This usually takes place 6-12 weeks prior to surgery, with exercise taking place 2-3 times per-week. exercise training, promotion of physical activity, improving diet and psychological support. This can include the use of GLP-1s.

The impact

- Both prehabilitation programmes, which might include GLP-1s, have been shown to reduce the number of people on surgical waiting lists who then proceed to surgery by 10%.⁸ Based on 2024 figures, nationally 10% represents 1739 fewer surgeries at a cost of around £13,263,353.
- At a local level, a similar reduction in Forth Valley (where 1153 primary hip and knee replacements were done in 2025) would equate to 115 fewer surgeries, costing a total of £879,393.

The cost

- There is still work to be done regarding costing prehabilitation services. However, it is likely to be similar to the £300/person cost noted in the 'Community-based structured programmes' section.

Shared-decision making

At all stages there needs to be consideration of shared decision making, and ensuring that treatment decisions are guided by people, in collaboration with healthcare professionals.

The impact

- Evidence around shared decision making shows that around 25% of people are likely to turn down elective surgery when offered a non-medical alternative in supported through shared decision making, compared to those who aren't.⁹ 25% represents 4,350 surgeries nationally, at a cost of £33,175,543.

⁸ [A preoperative package of care for osteoarthritis, consisting of weight loss, orthotics, rehabilitation, and topical and oral analgesia \(OPPORTUNITY\): a two-centre, open-label, randomised controlled feasibility trial - The Lancet Rheumatology](#)

⁹ Sepucha, K.R. *et al.* (2022) "Shared Decision-Making Is Associated with Better Outcomes in Patients with Knee But Not Hip Osteoarthritis: The DECIDE-OA Randomized Study," *Journal of bone and joint surgery. American volume*, 104(1), pp. 62–69. DOI: 10.2106/JBJS.21.00064.

Appendix One

Costings and flow methodology

This piece of work has brought together evidence-based practice from across Scotland. Where we want to highlight specific practice and impact in a particular area (such as the impact of Community Appointment Days in Grampian) we have noted the figures and pilot area.

However, due to lack of consistency in implementation, modelling has been undertaken to allow estimation of impact and costs. The below outlines the methodology behind the key elements of the model.

Digital self-management

- The referral rates noted around 27% self-management, 45% to First Contact Practitioner and 18% to community activities are based on an evaluated pilot in NHS Borders.
- The associated costs are based on an evaluated pilot in NHS Borders.

First contact practitioner

- The figure of 16% is an average from evaluated programmes involving the use of a First Contact Practitioner. This has been used to project changes in waiting lists.
- The figure of 3% referrals to Outpatient Orthopaedics is taken from evaluated programmes involving the use of a First Contact Practitioner in NHS Lothian, NHS Forth Valley, and NHS Borders. This has been used when modelling the system flow to ensure consistency across data where it hasn't been possible to express a reduction due to no baseline data.
- The figure of 20% referrals to community-based structured activity is taken from evaluated programmes where there is well developed community-based structured activity in NHS Lothian and NHS Forth Valley.
- The figure of 4% referrals to secondary physiotherapy is taken from evaluated programmes involving the use of a First Contact Practitioner in NHS Lothian, NHS Forth Valley, and NHS Borders.
- The cost of £16.08 per person was calculated based on NHS Borders spending £740,000 on their programme for a risk population of 30,000 (estimated locally to be 18% of the population).
- The staffing ratio was calculated based on NHS Borders staffing level of 6.3WTE FCPs and 1 Clinical Lead for a risk population of 30,000.

Waiting list projections

- The projections were based on calculations of:

- average rate of waiting list change since Jan 2022 (using PHS data) calculated by average number of people added to the list, minus average number of people taken off the list.
- Projected rate of waiting list change calculated by reducing the average number of people added to the list by 16% (and 10% and 5% for confidence intervals), and calculating the new rate of change as above.
- The waiting list projections also include a modelling for a 10% and 5% reduction in referrals to show impact where there might be less than expected decrease.
- The capacity was calculated as the difference between those being added to the list and those being removed, expressed as a percentage.

Community-based structured activity

- The figure of £150 per person was calculated based on the 'Best in Class' programme and includes the cost of a trainer, and venue hire. While the programme is open ended, this costing is based on someone attending 10 sessions.
- The figure of £300 per person for the more comprehensive support was calculated based on a recent return on investment undertaken in Dumfries and Galloway for their Active Lives programme. They noted £360,000 to expand their programme to 1,200 people.

Physiotherapy costing

- The cost of physiotherapy was put at £363 based on NHS Borders costing for their evaluation. This is comprised of a consultation and three follow-up sessions.

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