An osteoarthritis model of care should be a national priority for New Zealand

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ABSTRACT

Osteoarthritis is highly prevalent, disabling and costly to the person and the community. The burden of this chronic condition is predicted to increase dramatically over the coming decades. Healthcare spending on osteoarthritis is unsustainable and action is needed to improve care delivery. At present, there is an over-emphasis on surgical and pharmacological interventions, despite evidence supporting conservative treatments such as exercise, weight loss and education. While clinical guidelines provide recommendations regarding best practice (ie, *what* to do), they fail to address *how* to operationalise these recommendations into clinical practice. Models of care (MoCs) can help bridge the evidence-practice gap by outlining evidence-informed interventions as well as how to implement them within a local system. However, New Zealand has no osteoarthritis MoC. The Mobility Action Programme, funded by the Ministry of Health, is delivering evidence-informed, multi-disciplinary care for osteoarthritis through local initiatives. Although the programme remains under evaluation it presents an opportunity to inform development of a national osteoarthritis MoC for New Zealand. A policy framework, such as a MoC, is needed to scale up successful programs and deliver best practice care nationwide. Ultimately, addressing the burden of osteoarthritis will require system-wide approaches involving public policy responses to target primary prevention.

The burden of osteoarthritis

Osteoarthritis is a highly prevalent and disabling condition. Persistent pain, physical disability, depression, impaired work and social participation are common sequelae, which have major implications for healthy ageing and human capital in New Zealand.[1–4] Osteoarthritis is ranked as the 12th highest contributor to disability globally, and the 16th highest in New Zealand.[5] One in 10 New Zealand adults (10%; 370,000) live with the condition,[6] and the prevalence of arthritis (of which osteoarthritis is the most common form) has been projected to reach 17% by 2020.[7] By comparison, diabetes affects an estimated 257,700 (6%) New Zealanders.[8] Recent data from the US suggests that one in two adult Americans live with a musculoskeletal condition—a prevalence comparable to that of cardiovascular and chronic respiratory disease combined, costing $USD 213 billion in 2011 (or 1.4% GDP).[9] Older adults are most commonly affected, reported by 28% and 35% of New Zealanders aged 56–74 and 75+ years, respectively, although younger adults also experience considerable impacts on work ability and quality of life.[10]

Osteoarthritis is also costly. In New Zealand, the total cost of arthritis in 2010 was estimated at $3.2 billion.[7] Lost productivity was the greatest cost ($1.5 billion), as over 25,000 New Zealanders did not work due to arthritis. Health sector costs are also substantial, estimated at $695 million annually in 2010.[7] As a point of comparison, healthcare costs of diabetes were estimated at $686 million in 2008.[11] Joint replacements dominate hospital costs ($182.3 million), with over 8,000 hip and 7,000 knee replacements performed in 2015.[12] By 2026 the number of hip and knee replacements is projected to increase by 84% and 183%, respectively, equating to a further 6,000 operations at an additional cost of over $90 million annually.[13]

Reforming osteoarthritis care

A 'paradigm shift' in osteoarthritis management is required to delay or avoid the need for surgery by providing appropriate interventions to people with early disease.[14] Calls have also been made to optimise non-surgical and non-pharmacological management (for which supporting evidence abounds) for people with established disease, particularly in light of substantial evidence-practice gaps in this area.[15] In Australia the recent release of the Clinical Care Standard for Knee Osteoarthritis signifies a focus on improving quality and standardisation of care for osteoarthritis at a national level,[16] while at a jurisdictional level several Australian states including Western Australia, Victoria and New South Wales have developed local models of care (MoCs) to guide service delivery.[17–19] Similar initiatives in other nations have been reviewed recently.[20] In New Zealand the Ministry of Health's Long-Term Conditions Programme is supporting a systematic approach to the management of chronic conditions encompassing patient-centred coordinated care and the promotion of equitable health outcomes. Through this programme, knowledge sharing between healthcare professionals is being facilitated through workshops and clinical leadership, and best practice care is being promoted through patient co-design and self-management. Earlier, effective conservative management of osteoarthritis could alleviate the strain on the New Zealand hospital system and is likely to reduce indirect costs (such as lost productivity) by addressing the disability burden. Recently, modelling data from Australia highlight the financial benefits of emphasising early and appropriate care for osteoarthritis.[21] In this article we describe current osteoarthritis management in New Zealand, outline the need for change and present the development of a model of care as one possible solution. We present two hypothetical case studies illustrating both current management and projected management under an osteoarthritis model of care to highlight important differences in care delivery and patient outcomes.

Lower limb osteoarthritis management: the current state of play and lost opportunities

There is, as yet, no cure for osteoarthritis. Management is directed towards relieving pain and improving function and quality of life. Although medication (which is frequently offered as first-line treatment) can alleviate pain, this 'palliative' intervention is often recommended before conservative interventions.[14] This represents a lost opportunity to intervene. Joint replacement surgery, performed when pain is intolerable or function is significantly impaired, is expensive and not without risk, and could be avoided or delayed by earlier conservative interventions.[12] Conservative interventions for which strong evidence is available, such as exercise and weight loss,[22] are inadequately discussed by primary care physicians.[23] For example, weight loss strategies targeting females over the age of 50 years could prevent up to 48% of knee osteoarthritis in females.[24] As evidence of the link between overweight/obesity and lower limb osteoarthritis, the mean body mass index of patients undergoing primary joint replacement surgery in 2015 was 31.2kg/m^2 for knees and 28.9kg/m^2 for hip replacements.[12] Regarding joint injury, which together with obesity form the two major risk factors for osteoarthritis,[25] while there is good evidence for neuromuscular training programmes to substantially reduce the risk of anterior cruciate ligament (ACL) injury,[26] there has been limited widespread implementation of these prevention programmes. At present, osteoarthritis management is fragmented and episodic, with little inter-disciplinary collaboration to support optimal care. Moreover, there is substantial regional inequity in access to chronic care services across New Zealand despite attempts to embed health equity for all population groups into policy on chronic disease management.[27] Case study 1 illustrates an example of primary care osteoarthritis management within the present system.

A number of high-quality clinical practice guidelines have been developed by expert groups to guide evidence-based osteoarthritis management.[28] Although

recommendations vary across these guidelines, exercise, education and weight loss (as indicated) are consistently recommended as interventions supported by strong evidence. Yet despite this knowledge, a considerable evidence-practice gap remains, in particular for conservative, non-pharmacological management.[29] In the first case study, while Agnes' GP is aware of these clinical guidelines and recommends for Agnes to lose weight and increase her physical activity, these recommendations are not supported in practice by the healthcare system as there are no established pathways for referral to other healthcare professionals. While there are many reasons for this, a key limitation of clinical practice guidelines is that although they make valuable and evidence-based recommendations for practice (ie, *what* care), they fail to provide information on *how* to implement evidence into clinical practice and healthcare delivery.

Models of care: informing how to deliver best practice care in a health system

A model of care (MoC) is an evidence-based policy or framework that provides guidance on the ideal development and delivery of condition-specific care principles within a health system.[30] While similar to clinical guidelines in that both are evidence-informed, MoCs emphasise the operational elements of care delivery for the components of care described, hence specifying *what* the care components should be as well as *how* to deliver them within a health system. Outlining 'the right care, delivered at the right time, by the right team, in the right place, with the right resources' is ultimately the purpose of MoCs.[31]

A number of healthcare system-wide osteoarthritis MoCs have been developed and implemented in Australia,[17–19] the UK[32] and Europe.[33] These programmes share the common features of a chronic care model, including inter-disciplinary collaboration and coordination, individualised care and evidence-based interventions; in particular exercise, education and weight loss, with a view to self-management. These interventions are particularly relevant given the recognition of obesity and physical inactivity as shared risk factors for a number of chronic diseases. Initial evaluation of these MoCs has been positive in terms of improved patient outcomes and supporting delivery of and access to best practice care as well as a reduction in the number of patients requiring joint replacement surgery.[20] In light of a growing body of evidence and widespread acceptance of MoCs as a driver of health service reform, there is scope to adopt a similar shift in osteoarthritis care delivery in New Zealand.

A step in the right direction: The Mobility Action Programme

Currently, the burden of osteoarthritis in New Zealand is not adequately addressed through national health policy. While the problem of long-term conditions, including musculoskeletal conditions, is recognised in the 2016 New Zealand Health Strategy, insufficient attention has been paid to osteoarthritis specifically, particularly given its burden of disease and healthcare costs. This is in contrast to countries such as Australia where arthritis and musculoskeletal conditions have been recognised as a National Health Priority Area since 2002, and where a national service improvement framework for osteoarthritis, rheumatoid arthritis and osteoporosis has been developed to reduce the impact of these chronic conditions.[34]

As part of the New Zealand Government's mission to improve pain management in the community, in 2015 six million dollars were released over three years specifically to improve care for people with long-term musculoskeletal conditions. The Mobility Action Programme (MAP) is a resulting initiative of this funding, and is providing support to create community-based, multi-disciplinary teams to improve early intervention for people with hip and knee osteoarthritis as well as other musculoskeletal conditions such as low back pain.[35] The aim of the MAP is to improve health outcomes, namely to reduce pain and maximise function, for people with these long-term conditions through the optimisation of osteoarthritis care delivery in the community. Key objectives are enhanced diagnosis, self-management, education, exercise and pain management directed to those most in need. A range of practitioners and services are involved, including primary care physicians, physiotherapists, nurses, psychologists and dietitians. Care is individualised and emphasis is placed on evidence-informed strategies such as

self-management and conservative interventions, including exercise and weight loss.

The MAP is set to run until 2019. While the MAP is yet to be formally evaluated, and as such conclusions regarding its effectiveness cannot be made at present, formative evaluation of the individual sites is underway to identify those most viable in terms of outcomes, cost and utilisation. This evaluation will inform decision-making regarding the continuation of successful models of service delivery at different locations across New Zealand. If the MAP is found to deliver improved patient outcomes and provision of care, action would be needed to upscale this initiative and deliver best practice osteoarthritis care nationwide.

The next step: a New Zealand osteoarthritis model of care?

There is as yet no policy mechanism to adopt and implement any positive outcomes that may emerge through the MAP process. A New Zealand osteoarthritis MoC has the potential to bridge the evidence-practice gap by facilitating delivery of evidence-informed care for osteoarthritis, thus optimising outcomes for people with osteoarthritis and addressing the substantial cost burden. Adoption of a MoC for osteoarthritis would also accomplish the strategic themes identified in the New Zealand Government's 2016 Health Strategy by creating a health system that is "people-powered, closer to home, designed for value and performance and working as one team in a smart system".[36] It would also align with the World Health Organization's global strategy and action plan on ageing and health 2016–2020. These would be achieved through the provision of care by multidisciplinary teams, facilitating delivery of care through local services, improved access to primary care services to alleviate the burden on secondary care, and enhanced coordination and communication between healthcare professionals involved in providing care. Furthermore, consumers expect (and deserve) to be delivered a consistent standard of care across all regions of New Zealand. Recognising the increasing prevalence of multimorbidity in people aged 50 years and over, particularly in lower socioeconomic classes, it is important to adopt an integrated approach to chronic disease management, where policy and services for osteoarthritis are integrated with those for other chronic health conditions.[4]

The predicted cost benefits of improved osteoarthritis care are substantial. Better symptom management will enable working-age adults with osteoarthritis to stay at work for longer, addressing the $1.5 billion cost to the economy associated with absenteeism.[7] In light of evidence supporting the role of exercise to delay or avoid the need for surgery,[37] improved conservative management through a model of care could reduce waiting lists for joint replacement surgery, decreasing the healthcare burden. Formal economic evaluation of the MAP is due for release in 2020.

What could a New Zealand osteoarthritis model of care look like?

While thorough consultation is required to inform development of a New Zealand MoC, there are several guiding principles based on successful overseas examples. An osteoarthritis MoC would embody the principles of chronic care management: multi-disciplinary team interventions, collaborative care planning, evidence-based practice and a self-management focus. Components of care could include exercise, education and weight loss, in line with international guidelines.[28] In Case study 2, Bill's conservative management is optimised by his undertaking specific exercises for his hip, increasing his physical activity levels, improving his diet and optimising his analgesia.

Specific upskilling of health professionals is likely required, and extended scope of practice roles could be incorporated. For example, in the NSW Osteoarthritis Chronic Care Program an experienced physiotherapist leads the multi-disciplinary team to coordinate program delivery and perform assessments and interventions.[19] A similar component of care could be integrated into a New Zealand MoC, given physiotherapists' skills in exercise prescription and non-pharmacological chronic pain management. At present, 12 of the 17 MAP projects being delivered across New Zealand are physiotherapist-led. A key advantage of a physiotherapist-led component of care would be to facilitate co-care delivery, shifting the burden away from general practitioners. In Case study 2, Bill's physiotherapist is responsible for coordinating his care and facilitating referrals to other healthcare professionals.

Development of an osteoarthritis MoC must also consider vulnerable populations. Paradoxically, some population subgroups face the highest osteoarthritis disease burden, yet have poorer access to care.[38] Potential strategies to target management towards those most in need include understanding the population demographics of the area in which the MoC is being delivered, providing different modes of access and delivering culturally appropriate services. Attention must also be given to residents of rural areas, with telephone, video-conferencing, web-based and mHealth services offering potential solutions to implementation. For example, in Case study 2 if Bill were living in a rural area his physiotherapist might follow up with him regarding his progress via telephone.

There is now an internationally accepted framework to guide the development, implementation and evaluation of musculoskeletal MoCs.[39] Planning must involve relevant primary care stakeholders, including physicians, nurses, allied health professionals, policy makers and consumer representatives. Coherent teams are needed for delivery, and ongoing evaluation of programmes is essential.

Over the next two years, evaluation of successful MAPs will be undertaken to identify 'what works' in various local settings to inform MoC development. Policy support is needed to scale up successful programs and deliver best practice osteoarthritis management nationwide. In the first instance, this would entail recognition of osteoarthritis as a national priority area for intervention. Placing emphasis on the 'front end' of management in primary care would alleviate the burden placed on the hospital system. The primary care that Bill receives in Case study 2 has been subsidised by his local district health board and has the potential to delay or even avoid his need for surgery, saving hospital costs in the long run.

A system-wide approach: implementing primary prevention through public policy

While a MoC targeting osteoarthritis care delivery would go a long way to addressing the evidence-practice gap, more also needs to be done in the area of primary prevention to reduce the overall disease burden. Obesity and joint injury are the two major risk factors for the development of osteoarthritis.[25] Both of these are modifiable, yet not enough public health action is being taken to address these risk factors. Although primary prevention of obesity is challenging and will likely require a number of cross-sectoral strategies, weight loss as a public health intervention would be very effective in reducing new cases of lower limb osteoarthritis.[40] Interventions such as the Ministry of Health's Healthy Families New Zealand provide an example of a system-wide approach. Addressing the burden of osteoarthritis will require such system-wide approaches involving public policy responses to address primary prevention as well as development of a MoC to optimise care planning and delivery.

Key points

- Osteoarthritis is a highly prevalent, disabling and costly condition, however current management is unsustainable and with poor translation of evidence into practice.
- Models of care address the evidence-practice gap by informing *what* best practice care should involve as well as *how* to deliver it within a particular health system.
- A number of osteoarthritis models of care have been developed and implemented in Australia, the UK and Europe with evidence of improved patient outcomes and care delivery, as well as a reduction in the number of patients requiring joint replacement surgery.
- The Ministry of Health's Mobility Action Programme is providing support to create community-based, multi-disciplinary teams to improve early intervention for osteoarthritis in a number of locations in New Zealand.
- Evaluation of the Mobility Action Programme could inform development of a New Zealand osteoarthritis model of care to deliver best practice osteoarthritis management nationwide, however policy support is needed.

The current patient pathway

Case study 1: Agnes

Agnes is a 66-year-old lady who has lived with knee pain for many years. Over the past 12 months the pain has been getting worse to the point where she now has trouble walking up and down the stairs at home and doing household chores. At night the pain keeps her awake, and she is often tired and short-tempered as a result. Since retiring she cares for her two young grandchildren two days a week while her daughter works, but lately this is becoming increasingly difficult. She used to play social tennis twice a week but was forced to stop playing several months ago as her knees felt too sore and weak. She hasn't been getting out to visit her friends and as a result she is becoming increasingly isolated and is showing signs of depression.

Agnes saw her GP six months ago during a particularly bad episode of knee pain and swelling. She was given a referral for an x-ray which showed she had moderate radiographic osteoarthritis in both knees. Her GP noticed that her weight had increased since her last visit one year prior and she was now classified as obese. The GP prescribed pain-relieving medication and advised Agnes to take anti-inflammatory medication as needed. She also provided Agnes with information about weight-loss and exercise although Agnes was not referred on to other health professionals.

Agnes has been referred to the orthopaedic department of her local district health board. She is worried as she might have to wait six months to see the surgeon, during which time she feels she won't be able to cope. Her daughter will have to reduce her workload as Agnes likely won't be able to keep caring for the grandchildren. Agnes is very anxious and feels like her quality of life is getting worse and worse.

An anticipated patient experience under a model of care

Case study 2: Bill

Bill is 61 years old and a long-time sufferer of left hip pain. Recently the pain has been getting worse and he has been limping quite badly, especially on busy days. He has been overweight for many years and had taken up jogging to try to lose weight and improve his heart health, however he has found that this makes the pain worse so he has stopped exercising. He still works part-time but is starting to feel as though his hip will force him into retirement earlier than planned.

Bill decided to see his local physiotherapist upon recommendation from a friend who had knee pain. The physiotherapist performed a comprehensive assessment and advised Bill that he may have osteoarthritis. Bill's GP referred him for an x-ray which confirmed this diagnosis. The physiotherapist recommended for Bill to take part in a programme to help manage his symptoms and together they developed a care plan. The physiotherapist talked to Bill about the causes of osteoarthritis and outlined what could be done to help apart from surgery and drugs. Bill also joined a group exercise program to improve the strength and movement in his hip. He was then referred to a local pharmacist for advice on pain medication, to an exercise physiologist for a general exercise plan and to a dietician for a healthy eating plan. Bill was happy to hear that all of these services would be partially funded by his local district health board.

Six weeks into the program, Bill has made good progress. His hip feels stronger and his limp has reduced, and he has been walking for half an hour three times a week. He has lost 3kg and feels much healthier. He is even considering taking on extra hours at work as he enjoys his job and wants to save for retirement. The physiotherapist has discussed the possibility of referring him to the orthopaedic surgeon but they are both happy with his progress and are delaying this for now. Bill feels as though he is in control and is confident to continue his exercise and diet regime on his own, knowing he can return to the physiotherapist if his condition changes.

Competing interests:
Dr Briggs reports grants from Australian National Health and Medical Research Council, grants from Bone and Joint Decade Foundation outside the submitted work; and Andrew Briggs led the development of an osteoarthritis model of care for Victoria, Australia, during 2015–2016. Dr Larmer reports affiliation with Ministry of Health and Arthritis New Zealand during the conduct of the study.

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