

ORIGINAL ARTICLE

# Systems for implementing best practice for a chronic disease: management of osteoarthritis of the hip and knee

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## Key words

osteoarthritis hip, osteoarthritis knee, clinical pathway, best practice.

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## Abstract

**Background:** Effective implementation of evidence-based care has been associated with better health outcomes; however, evidence-based clinical practice guidelines have been used with varying success.

**Aims:** This study aimed to develop integrative tools to support implementation of best practice recommendations for nonsurgical management of osteoarthritis (OA) of the hip and knee and to identify barriers to effective implementation.

**Methods:** Published, peer reviewed clinical practice guidelines were updated and translated into an OA care pathway. Key decision nodes in the pathway were identified by a Multidisciplinary Working Group. Qualitative research methods were used to inform pathway development and to identify barriers and enablers for pathway implementation. Qualitative components included purposively selected stakeholder focus groups, key informant interviews and patient process mapping of 10 patient journeys in different settings over a 3-month period. All interviews, facilitated by a trained project officer, were semistructured, recorded, then thematically analysed and summarized.

**Results:** An OA care pathway, clinician and patient toolkits were developed that met the needs of multidisciplinary end-users. Several system- and setting-specific barriers to pathway implementation were identified. Opportunities to improve patient access, interprofessional communication, patient information and education and continuity of care processes were identified.

**Conclusion:** Integrative tools for implementation of best evidence care for patients with OA of the hip and knee were tailored to end-user needs and preferences. Multiple barriers exist that potentially limit effective implementation of best evidence. Comprehensive assessment of barriers and enablers to effective guideline or pathway implementation is recommended before implementation and evaluation.

## Introduction

Osteoarthritis (OA) is the most common musculoskeletal disorder and is a major contributor to the health burden and to healthcare costs.<sup>1</sup> Timely access to hip and knee

joint arthroplasty in appropriate patients is of the utmost importance in management of severe OA. However, there remains an opportunity to reduce the likelihood of progression or to slow progression in patients using therapeutic interventions such as physical therapy and weight loss and arthritis self-management programmes.<sup>2</sup>

Implementation of best care often requires coordination of pharmacological and nonpharmacological therapies provided by diverse health care professionals within different healthcare settings. There have been several reports of gaps in provision of best care for common illnesses,

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including arthritis.<sup>3–8</sup> Tools, such as clinical practice guidelines (CPG) have been used to improve translation of evidence into practice. Medical clinicians support their use,<sup>9</sup> however sustained clinician change behaviours and improved patient outcomes related to their use are variable and often disappointing.<sup>10</sup> Failure to integrate CPG into normal workflow practice is one barrier to successful CPG implementation. A care pathway that forms all or part of the patient record is one tool that facilitates integration of evidence into practice.<sup>11</sup>

In this paper we describe the development of an OA clinical pathway (CP) and integrative toolkit for the implementation of evidence-based recommendations for non-surgical management of OA hip and knee.

## Methods

### Project management structure

The following groups were identified as potential end-users of an OA pathway and integrative toolkit: consumers, carers, medical clinicians (general and specialist practitioners) and allied health professional groups (physiotherapy, occupational therapy and dietetics).

The model of care chosen as the framework for developing an OA CP was based on recommendations from the Institute of Medicine published in the report 'Crossing the Quality chasm'.<sup>12</sup> The report recommended that systems of care for chronic disease in the twenty-first century are patient centred, collaborative and knowledge based.

A Multidisciplinary Working Group (MWG) was purposively chosen to reflect the multidisciplinary nature of health care needs of people with OA and the likely end-users of an OA-integrative toolkit. The group included representation from consumer organisations (Arthritis Victoria, Chronic Illness Alliance), general practice, orthopaedic surgeons, consultant rheumatologists, rheumatology registrar, physiotherapist, dietician, epidemiologist, project officer, project director.

The agreed terms of reference for the MWG were to refine the scope of the project, to ratify the proposed model of care, to contribute to identifying the key decision nodes for development of a clinical pathway (CP) of management and to provide iterative responses to OA toolkit development. The group met face to face on a monthly basis and continued iterative development by email communication.

### Data collection

#### Focus groups and key informant interviews

Qualitative data collection was undertaken to inform identification of key decision nodes in OA management,

identify barriers to implementation of evidence-based recommendations and develop content and format of the integrative tools.

Purposive selection of participants was undertaken for inclusion in focus groups (FG) and key informant interviews (KII). Participants included general and specialist medical clinicians, allied health professionals and patients who had OA hip or knee. Health professional participants were targeted to represent professional and leadership perspectives as well as acute and community sector perspectives, public- and private sector perspectives and geographical (metropolitan/rural) perspectives. Patient participants were selected to represent a broad age distribution, sex perspectives, culturally and linguistically diverse perspectives and geographical perspectives.

The FG and KII were semistructured and were facilitated by a trained interviewer. Information was recorded and later summarized and thematically analysed. The Health professional FG and KII considered ideal models of care for OA hip and knee, best practice components of clinical care, awareness and use of the arthritis self-management programme, key process issues in patient management, practice and system management issues including workforce and information management. Patient FG and KII considered patient understanding and knowledge of OA, key processes in OA and general medical management, patient–consumer expectations of specialist, GP and allied health professional consultations and issues relating to continuity of care.

#### Patient journey process mapping

The journey for 10 patients attending public and private, and general and specialist clinics was mapped using standard methodology.<sup>13</sup> The main aim was to provide a description of system processes encountered by patients following an episode of care and to contribute to identification of system and of patient perceived barriers to implementation of best practice clinical management. The process cannot document all possible journeys but is purposively targeted to capture similarities and differences for patients experiencing care in different settings and to capture a rich description of barriers and facilitators that influence system navigation. Patients were recruited after informed consent from hospital specialist clinics, private specialist clinics or from general practice. Three semistructured interviews occurred: at recruitment, 6 weeks and 3 months postrecruitment. Baseline interviews were performed face to face and subsequent interviews were undertaken by telephone. Key personnel involved in specified patient processes were also interviewed. These included clinic nursing staff, booking clerks and radiology administrative and clinical staff.

## OA hip and knee CPG and literature review

Published, peer reviewed CPG pertaining to management of OA hip and knee were identified in a literature search of Medline 1966–2003, CINAHL, Cochrane Collaborative and DARE databases. Other CPG were sought by searching grey literature on national and international websites. Six CPG were identified and reviewed.<sup>14–20</sup> Where the MWG or project team was not satisfied that adequate data had been presented relating to a decision node or where there had been recent publications, the relevant literature was reviewed and assessed by SC using a structured search strategy and critical appraisal tool appropriate for intervention studies. Proposed recommendations were updated in consultation with the MWG and local rheumatologists. More recently, the evidence has been updated using the methods described above for the period 1 January 2003 until 30 June 2005.

## Results

### Integrative tools

#### An OA clinical pathway model

Using information gained from FG, KII and the literature review, key decision nodes were identified and positioned as the central elements of the CP (Figs 1 and 2). Decision inputs (tools to aid decision making for each decision node) were added after MWG consensus. Decision outputs (recommendations for documentation of action response to decision node) were also included. Pathway format was modified to accommodate end-user preferences. The pathway model can be used to develop site-specific clinic running sheets.

#### Clinician and patient toolkits

Qualitative information from FG and KII identified a need for clinician and consumer toolkits to support CP implementation. Clinicians requested a summary of evidence supporting CP recommendations targeted for general practitioners and allied health professionals, information regarding location of community services, and a patient care plan template. The MWG suggested that National Health and Medical Research Council (1999) recommendations regarding use of formal levels of evidence required additional explanation to be useful at the point of providing clinical care. A nonhierarchical visual format (Fig. 3) that mapped evidence for intervention against outcome domains was therefore chosen and formal levels of evidence were qualified by a summary of the quality of that evidence (complete evidence summaries can be obtained from the author C. B.).

A consumer toolkit was developed in response to identified consumer needs and includes a 'patient story', information about OA including diagnosis and OA management issues such as depression, other emotional issues and physical activity, patient care plans for immediate management and for subsequent management of an acute flare of their condition, and a list of community resources, including Arthritis Victoria and arthritis self-management courses. Consumer information developed by Arthritis Victoria (AV) was used preferentially for the toolkit as development had been directed towards a literacy level of year nine.

### A system analysis of modifiable and nonmodifiable barriers to implementation of best evidence recommendations

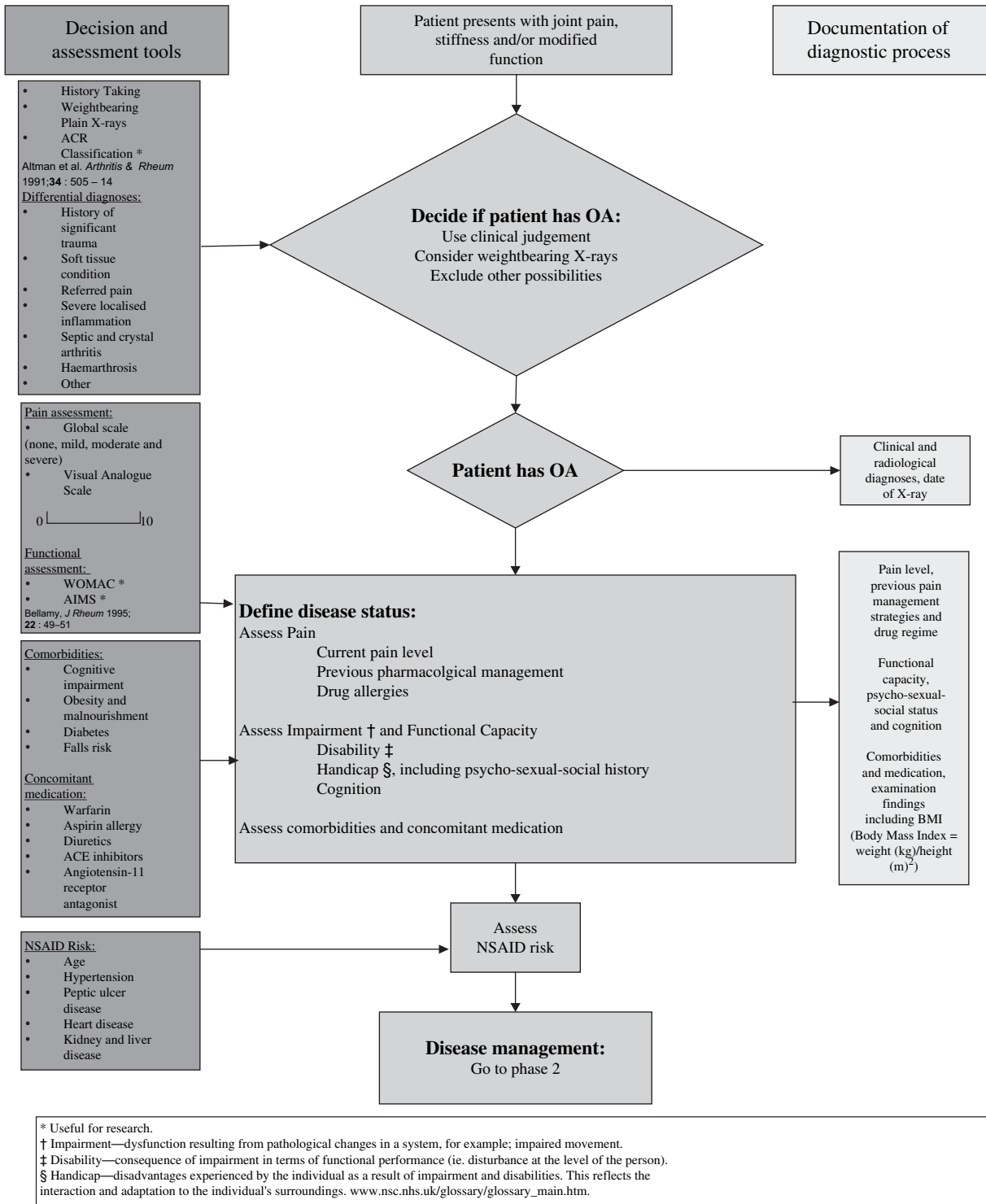
The major issues identified in FG and KII are summarized and presented as a matrix in Table 1. The themes were summarized in relation to quality of care domains and mapped against the model of care framework. Modifiable and nonmodifiable system and clinician and patient barriers were identified. The major system barrier identified was fragmentation of care across multidisciplinary groups in the hospital and in the community. In addition, current systems appear inadequately developed to support consistency in referral, triage, assessment and communication processes. Lack of appropriate data system support was also documented to be a contributory factor for inconsistencies in information collection, communication and retrieval between health providers. The matrix offers a template for targeting modifiable barriers and improving care within current system limitations.

## Discussion

Overseas data suggest that implementation of best care for OA is inadequate. It has been estimated that one-third patients with OA fail to receive recommended care,<sup>4</sup> one-fourth receive OA-disease-specific patient education and between 29 and 40% receive exercise therapy.<sup>21</sup> Fifty percent of patients received a recommendation for comprehensive therapy,<sup>5</sup> 73% patients in another study were given a recommendation to use nonpharmacological treatment<sup>22</sup> and inadequacies in documentation of pain assessment and treatment in vulnerable seniors with OA enrolled in managed care organizations have been reported.<sup>7</sup>

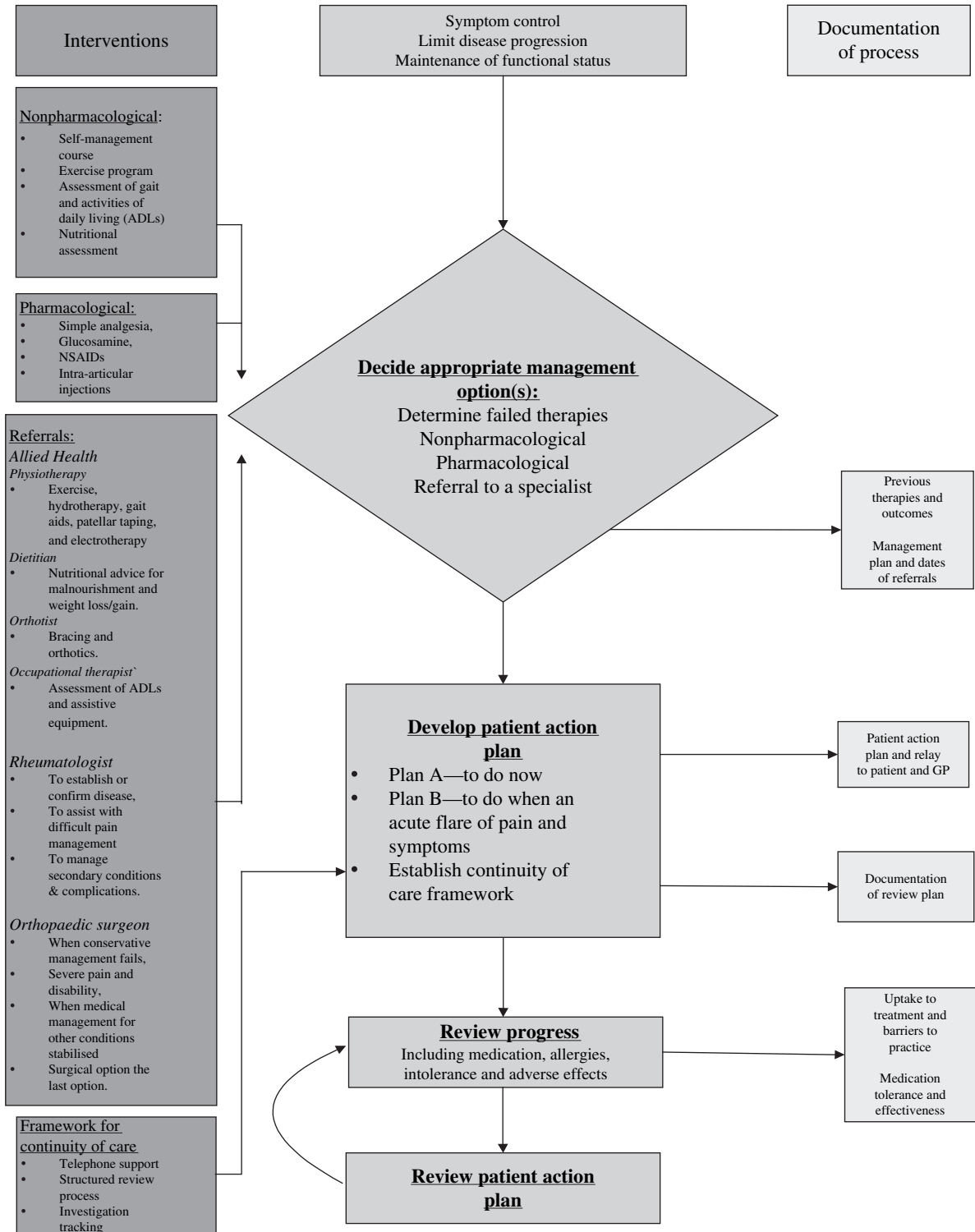
Improving uptake of evidence remains a challenge.<sup>23</sup> Lack of CPG effectiveness has been attributed to multiple system, clinician and patient factors and may be influenced by development and implementation methods.<sup>10,24</sup> As a result, a variety of methods has been used to promote effective implementation and uptake.<sup>25</sup> It is likely that

## OA Clinical Pathway Model of Care Phase 1 - diagnosis



**Figure 1** OA clinical pathway model of care. Phase 1—diagnosis. ACE, angiotensin-converting enzyme inhibitors; ACR, American College of Rheumatology; AIMS, abnormal involuntary movements scale; NSAID, non-steroidal anti-inflammatory drug; OA, osteoarthritis; WOMAC, Western Ontario and McMaster University Osteoarthritis Index.

## OA Clinical Pathway Model of Care Phase 2 - Disease Management



**Figure 2** OA clinical pathway model of care. Phase 2—disease management. NSAID, non-steroidal anti-inflammatory drug; OA, osteoarthritis.

Interventions	Goals				
	Symptom control pain and stiffness	Limit disease progression	Optimize and maintain function	Optimize and maintain quality of life	More effective health care use
<b>Nonpharmacological management</b>					
<i>Psycho-educational</i>					
<b>Self-management course (arthritis or general)</b>	†			†	†
<p><b>Level 1 evidence.</b> Systematic reviews have demonstrated that arthritis self-management education programs result in small reductions in pain and disability.</p> <p><b>Recommendation:</b> Patient self-management education programs should be included in the patient management plan.</p>					
<i>Physiotherapy</i>					
<b>Exercise</b>	†		†	†	
<p><b>Level 1 evidence.</b> Exercise and physical therapy reduce pain and disability in people with hip or knee OA. Hip OA responds better to cardiovascular training, whereas knee OA is more receptive to quadriceps strengthening. Accumulating evidence suggests walking is safe and effective for knee OA. No study has compared the effect of cycling with other forms of exercise nor against a control. One study did show that low- and high-intensity cycling were equally effective in improving function and reducing pain.</p> <p><b>Caution:</b> Quads strengthening in knee OA with malalignment or joint laxity, MAY lead to damaging joint reaction forces, which can exacerbate disease progression.</p> <p><b>Recommendation:</b> Quads strengthening exercises for knee OA and cardiovascular exercise for hip OA, following an individual patient assessment.</p>					
<b>Tai Chi</b>			†	†	
<p><b>Level 2 evidence.</b> One randomized controlled clinical trial demonstrated <u>significant improvements in arthritis self-efficacy, quality of life and functional mobility</u>. This study evaluates the effects of a 1-h class twice weekly for 12 weeks, in individuals with OA. Good evidence regarding Tai Chi and falls prevention.</p> <p><b>Recommendation:</b> Consider in patient action plan especially if there is a history of falls.</p>					
<b>Patellar Taping</b>	‡			†	
<p><b>Level 2 evidence.</b> Joint bracing or taping may improve quality of life and symptoms compared with control treatment in people with anterior knee pain. Reduction in pain was documented with 3 weeks of taping, the effect lasting 3 weeks postcessation of treatment.</p> <p><b>Recommendation:</b> Consider patellar taping in patients with anterior knee pain.</p>					
Interventions	Goals				
	Symptom Control Pain and stiffness	Limit Disease Progression	Optimize and Maintain Function	Optimize and Maintain Quality of life	More Effective Health Care Utilisation
<b>Hydrotherapy</b>	‡				
<p><b>Level 1 evidence.</b> A systematic review found most trials demonstrated positive effects but methodological flaws limited a definitive conclusion about efficacy. Hydrotherapy in combination with exercise and patient education was associated with reduced pain and increased functional activity and quality of life.</p> <p><b>Recommendation:</b> Consider in management plan in association with education program, especially if weight-bearing exercise tolerance is low.</p>					
<b>Knee Braces</b>	‡				
<p><b>Level 1 evidence.</b> A systematic review reported limited evidence (one study) to support use of a knee brace.</p> <p><b>Recommendation:</b> The use of a knee brace for knee OA remains unclear and further research is indicated.</p>					

**Figure 3** Summary of evidence for recommended management strategies (extract only. The full set of tables and supporting literature summary can be obtained from the author (C. B.)).

successful integration of evidence at the point of care within a complex system requires not only an evidence-based resource such as CPG, but also translation of CPG recommendations into integrative an tool(s) that will fulfil end-user preferences and needs and allow for local

contextual factors that act as barriers and facilitators to implementation.

We have used a multidisciplinary approach and a variety of qualitative research methods to develop integrative tools that were additionally informed by a systems

**Table 1** Barriers to comprehensive integration of care for ambulatory patients with OA hip and knee

	Safety	Access	Timeliness	Effective	Efficient	Satisfaction
Knowledge based	No standardized guidelines or protocols available in clinics for medication management No risk stratification tool available for patients at high risk of medication adverse events	Glucosamine access limited by cost Nonpharmacological management limited by inadequate community capacity for physiotherapy and other allied health professionals (nutritionists) Explicit criteria regarding referral to orthopaedic surgery	Triage systems are applied inconsistently and without formal explicit criteria and protocols	Glucosamine intervention may be underused Documentation of uptake of recommendations inconsistent		Patients indicated a need for more information about their condition Clinicians indicated a need for more information regarding local services
Patient centred	No formal protocols developed for follow up of medications commenced in acute care ambulatory clinics Variability in approach to use of diagnostic tools Reduced confidence in GP group for performing intra-articular injections Lack of patient information re medications Variation in management strategies for ensuring continuity of care	Clinical appointments are inflexible and unresponsive to patient perceived need Transport inadequacies limited access for some patients to acute care clinics and rehabilitation department Variable waiting times according to health provider, health sector (public/private) and geographical location Workforce issues	Variable access to different health care providers in different health settings	Inadequate knowledge and understanding of disease may limit uptake of recommendations Few patients are referred to or take up recommendations to participate in ASMP	Care provision not designed from patient perspective Current funding models are based on single provider, acute episodic care provision not continuous chronic care models	No formal satisfaction assessments performed Continuity of care was a significant issue in patient satisfaction
Collaborative	Variable quality and content of communication methods	Lack of coordination of specialist clinician and Allied Health Professional assessments	Variable content and legibility of medical record documentation	Fragmented care results in need for multiple visits, delayed AHP assessments	Health providers have limited understanding of each others roles Clinicians have little experience of working in multidisciplinary teams	

ASMP, Arthritis Self Management Programme.

analysis of modifiable and nonmodifiable barriers to effective implementation.

Rapid access to information at the point of care has been identified as a necessary factor for ensuring effective implementation of CPG. Integration into the workflow is also desirable. The MWG chose an OA CP as the preferred integrative tool for implementation of best practice recommendations for the following reasons: a study of barriers to durability of multidisciplinary CPG had previously identified CPG format as a barrier for nonmedical end-users,<sup>26</sup> processes of care can be documented directly within a pathway format, input decision aids are immediately available at the point of care and output documentation facilitates continuous quality improvement audits. In addition, CP have been associated with improved assessment, better documentation and communication although their relationship with improved patient outcomes is unclear due to a lack of controlled clinical trials.

Development of a patient toolkit was informed by patient perceived need. The role of patients in the decision-making process has changed.<sup>27</sup> Patients often have inadequate understanding of their condition.<sup>28</sup> This may have important implications with regard to uptake of risk prevention behaviours and ability to participate as an informed consumer in the political process that informs system change. Patient education and empowerment, and health outcomes such as pain, can be improved by participation in self-management programmes.<sup>29</sup> The uptake of these programmes is currently limited by clinician and patient awareness as well as limited community capacity to provide programmes. Special patient population needs must also be considered. Our patient population includes a high proportion of people for whom English is a second language. Currently, there is limited access to translated written information. Preference for information format may also reflect literacy skills. The Australian population has an average reading level of approximately year eight;<sup>30</sup> yet, a study of written information provided by clinicians and consumer groups in Victoria to patients with rheumatoid arthritis showed the material to have an average reading level of year eleven.<sup>31</sup> Where possible, our patient toolkit incorporated information developed by the key consumer group, Arthritis Victoria, that was suitable for a reading level of year nine.

Several other potential barriers to successful CP implementation were identified. The barriers documented suggest that the current system is not adequately patient centred and proactive but is system centred and reactive. Poor integration of multidisciplinary services within and across health settings is a fundamental barrier to ideal chronic disease management. For patients, access difficulties (both of time and place) to health professional services may be a significant barrier when considering risk reduc-

tion activities, particularly when other health issues exist that may be perceived to be of higher priority or more easily addressed through medication management alone. Opportunities to improve local systems clearly exist including improved intersectoral communication, improved triage and interprofessional referral systems, improved delivery of patient information and education and improved processes to support continuity of care.

Workforce issues for all health professionals were frequently cited as a barrier to health professional assessment. Specialist care access was especially difficult in rural settings, whereas there was limited access to allied health professions in all areas. Time pressures can be a barrier to best care by resulting in brief consultations that are associated with less patient education, less patient questioning and lower levels of patient confidence.<sup>32,33</sup> Newer models of care that change the orientation of health care provision from sole practitioner care provision to a multidisciplinary team approach may improve a patient's health care experience and has been associated with improved patient satisfaction, health status and adherence to evidence-based guidelines.<sup>34</sup> This model can be provided at a single site or at diverse sites with case coordinators and case managers being increasingly used to better integrate acute, subacute and community care provision. Their role in the ambulatory care setting, particularly for those with musculoskeletal disorders has yet to be fully explored.

There are several limitations to our study. A broad range of stakeholders was consulted, but only a small selection within each group, thus limiting our ability to generalize results to entire stakeholder groups. There was a focus on acute ambulatory care to a greater extent than on community care and although we have extensively documented modifiable barriers in different settings, a comprehensive feasibility study is now planned to assess utility and resource implications in different specialist and general practice settings. In the longer term, a controlled trial evaluation of CP and toolkit implementation is necessary to assess whether these tools will affect long-term change behaviours and be associated with improved patient outcomes.

In summary, we would suggest that a preimplementation comprehensive system analysis is required to fully define the system within which change behaviours are desired. Imposing a tool for implementing CPG recommendations within a model of care that does not support the tool recommendations is likely to result in ineffective implementation or implementation that has limited durability.

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