



Allied health integration: Collaborative care for arthritis and other musculoskeletal conditions

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Acronyms

AASW	Australian Association of Social Workers
ABS	Australian Bureau of Statistics
ACI	Agency for Clinical Innovation
ACPAC	Advanced Clinician Practitioner in Arthritis Care
AHP	allied health practitioner; allied health professional
AHPA	Allied Health Professions Australia
AIHW	Australian Institute of Health and Welfare
AMQuIP	Arthritis and Musculoskeletal Quality Improvement Program
AMSEC	Australian Musculoskeletal Education Collaboration
BMD	bone mineral density
CATS	Clinical Assessment and Treatment Services
CI	clinical indicator
DALYs	disability-adjusted life years
EPC	Enhanced Primary Care program
GP	general practitioner
IA	inflammatory arthritis
KPI	key performance indicator
MBS	Medicare Benefits Schedule
MoC	Models of Care
MSF	Musculoskeletal Services Framework
NHS	National Health Survey
NICE	National Institute for Health and Clinical Excellence; National Institute for Health and Care Excellence
NSAIDS	non-steroidal anti-inflammatory drugs
NSW	New South Wales
OACCP	Osteoarthritis Chronic Care Program
ORP	Osteoporotic Refracture Prevention
OT	occupational therapist
PHC	primary health care
PHCO	Primary Health Care Organisation
RACGP	Royal Australian College of General Practitioners
TAP	The Arthritis Program
UK	United Kingdom
US	United States
WA	Western Australia
WHO	World Health Organization

Executive summary

Policy context

Musculoskeletal conditions, including rheumatoid arthritis, osteoarthritis and osteoporosis, are prevalent in the Australian population, and they impose a substantial burden on the health care system and the community, reflected by their status as a national health priority area. They are the main cause of impaired physical functioning globally. These conditions have high chronicity rates and often have a long term impact, leading to reduced mobility and dexterity, chronic pain, reduced capacity for employment, and negative impact on family and social life. Much of the care for these conditions is provided in primary health care (PHC) settings.

Allied health practitioners (AHPs) play a key role in the management of musculoskeletal conditions. However, there is a recognised need to improve the engagement and integration of AHPs into PHC in general. This was reflected in the 2010 *National Primary Health Care Strategy*, which highlighted better management of chronic conditions as a key priority for the sector and regional integration as a building block for such improvements. Although there is some evidence internationally relating to interdisciplinary support and AHP models for other specific conditions, such as diabetes, there has been little evaluation of the literature on collaborative models specific to musculoskeletal conditions. The aim of this report is to identify and summarise evidence related to models and mechanisms for the engagement of AHPs in collaborative care for chronic conditions based in the PHC sector.

Key findings

Benefits of collaborative care include the ability for AHPs to address non-medical, non-surgical needs of patients and target the multifaceted nature of their conditions. It is widely recommended that AHPs be involved in multidisciplinary teams providing care to patients with musculoskeletal conditions. However, there is evidence that this occurs only to a limited extent. There are some promising models and strategies to improve AHPs' involvement in collaborative care, but as yet few have been evaluated rigorously. Furthermore, although multidisciplinary teamwork is a positive step, most often this practice reflects a form of 'collaboration' rather than fully integrated care.

Apart from pharmacists, who are involved primarily in a dispensary role, it is most often physiotherapists and occupational therapists who are involved in the care of patients with musculoskeletal conditions. Several models of integration between general practice and AHPs for the management of musculoskeletal disorders include physiotherapists and occupational therapists in prominent roles.

There are some examples of effective models from around the globe, particularly in relation to arthritis. Australian examples include the *Osteoarthritis Chronic Care Program* in New South Wales, which is based on musculoskeletal coordinators and multidisciplinary teams working closely with general practitioners (GPs), and the *Western Australian Inflammatory Arthritis Model of Care*, which enacts guidelines that emphasise multidisciplinary teamwork and inter-professional education. In Canada, *The Arthritis Program* is a longstanding model that incorporates a range of health professionals with a focus on shared visions, values and resources (i.e. 'one patient, one chart') and empowering patients to maintain their own health. A second Canadian model, the *Advanced Clinician Practitioner in Arthritis Care program*, focuses on training for extended roles.

Although there is some promising preliminary evidence of potential cost-effectiveness in Australia, some other evidence also suggests that multidisciplinary, multifactorial models are not always cost-effective when compared with usual care.

Barriers to AHP integration include:

- The complexity of the Australian health system and funding models
- Challenges stemming from workforce turnover and short-term positions
- Difficulties with access to technology
- Lack of rewards or financial incentives for integration
- Limited knowledge of different professionals' skills
- Conflicting organisational culture and historical biases
- Insufficient evaluative evidence.

Although there is a moderate amount of information available about evidence-based practice by AHPs for musculoskeletal conditions, there seems to be limited uptake or translation of that evidence into practice in PHC, and a dearth of evidence about the extent, effectiveness, and cost-effectiveness of allied health integration into PHC.

In addressing barriers, some potential mechanisms to enable integration have been suggested. These include:

- Raising awareness of different professionals' skills and the benefits of collaborative care, often through inter-professional education
- Developing infrastructure for shared resources and supporting co-location (e.g. GP Super Clinics)
- Encouraging effective communication and referral processes
- Providing financial incentives for collaboration (e.g. Medicare rebates)
- Guidance by champions and leaders
- Developing trust and respectful relationships.

Policy considerations

Based on the findings of this report, the following points may be considered:

Data collection and terminology

- To provide more accurate information about AHP involvement in care, data collection needs to be improved because privately funded AHP services are currently not recorded in Medicare or public hospital statistics, which are the main sources of data.
- Routine monitoring of outcomes, including key performance/clinical indicators and patient and health professional perspectives, should be implemented to evaluate the benefits of collaborative and integrated care.
- When referring to the involvement of 'allied health' practitioners/professionals in integrated care, it is important for publications, policies and programs to be explicit as to which practitioners are included, which services they provide, for which disease states, and at which stages on the care continuum these services are proffered.
- Policies and programs need to be consistent in definitions of terms such as 'integration' and 'collaboration'.

Benefits of AHP involvement

- AHPs have the skills to address many non-medical, non-surgical needs of patients (e.g. independent living and falls prevention).

- AHPs have the skills to coordinate multidisciplinary evidence-based care.

Models of integrated care

- Some current models show promise, but they need to be evaluated, with findings made publicly available.
- Models that include a musculoskeletal coordinator (e.g. the *Osteoarthritis Chronic Care Program* in New South Wales) seem to be particularly promising.
- Evaluations should incorporate both quantitative and qualitative components, including health economic analyses, and should evaluate both process and outcomes, including effectiveness and cost-effectiveness.
- Based on infrastructure and principles of co-location and shared resources, GP Super Clinics and other PHC organisations offer potential for encouraging integrated practices, but there is a need for research into whether and how collaboration occurs in these settings.

Tackling barriers and supporting enabling mechanisms

- Consistent multidisciplinary guidelines for musculoskeletal care, including appropriate referrals to AHPs, should be developed, adequately disseminated, incentivised, and adhered to.
- Governance processes should be investigated, with the introduction of coordinators to connect the different health professionals and support patients' need for continuity of care.
- Financial incentives that not only encourage collaborating between specific individuals (e.g. referral processes) but also incentivise teamwork could be implemented. For example, rewards for case management approaches which involve care coordination meetings.
- The Enhanced Primary Care program (or a variation) could be reviewed with the aim of restructuring and renewing the program to provide an avenue for financial incentives to support collaboration.
- The continued support of the National Broadband Network and electronic health records will encourage the use of technology and ability to share resources.
- Based on success with training days and education programs, inter-professional education needs to be encouraged, including consideration of what can be done at a university curriculum level.
- There is a need to reflect on organisations' and health professional groups' histories and cultures and the impact they might have on the implementation of policies and practices.

Methods

A rapid review of the literature on the involvement of AHPs in the management of musculoskeletal conditions was undertaken, specifically seeking evidence of successful strategies and models to improve the integration of AHPs into PHC. A selection of relevant academic databases was searched (PubMed, the Cochrane Library, CINAHL [Cumulative Index to Nursing and Allied Health Literature], the Informit databases [including Australasian Medical Index and AgeLine]), and Google Scholar.

Searches were restricted to English language publications and the accepted time period was primarily 2009-2013. A snowballing technique was used to identify additional relevant studies from bibliographies of sourced citations. Individual experts and organisations relevant to multidisciplinary musculoskeletal care were also contacted for information.

Context

General practitioners (GPs) provide health care to the vast majority of Australians. Recent reforms of the Australian health care system and a focus on the role of primary health care (PHC) have led to the establishment of primary health care organisations (PHCOs) aimed at improving the quality of, and access to, health care in Australia by co-locating (e.g. GP Super Clinics) or formally connecting services (e.g. Medicare Locals). Although this co-location encourages integration at a meso (organisational) level, focusing on how to support collaboration across the whole system is an important consideration. A key component of this shift is the integration of PHC and allied health care services. Access to allied health services is of particular relevance to individuals with one or more chronic or complex conditions, for whom the nature of the condition can impact on different aspects of physical and psychological health and wellbeing.

In 2002, arthritis and musculoskeletal conditions were declared a National Health Priority Area (AIHW, 2008b). In 2011-12, 14.8 per cent of Australians (approximately 3.3 million people) had arthritis (ABS, 2012, p 16), and 3.3 per cent (approximately 726 000 people) had osteoporosis. Due to the nature of the conditions and their likely impact, not only on physical wellbeing but also on psychological and social functioning, people with arthritis and musculoskeletal conditions benefit from support from integrated services incorporating both general practice and allied health. Conservative management by GPs and AHPs is often recommended as first-line care. For example, many people with osteoporosis would benefit not only from GP care and treatment, but also from services provided by allied health practitioners (AHPs), such as dietitians and physiotherapists. This multidisciplinary approach is also beneficial for addressing the high levels of other comorbidities that are common in populations with musculoskeletal conditions (AIHW, 2013b).

To address the need for effective musculoskeletal care, the Department of Health and Ageing (now the Department of Health) implemented the Better Arthritis Care program (2002 to 2005), followed by the Better Arthritis and Osteoporosis Care program (2006 to 2010) (Department of Health [and Ageing], 2010) and the Arthritis and Musculoskeletal Quality Improvement Program (AMQUIP), managed by the Royal Australasian College of Physicians (Brand et al., 2011).

Background

Arthritis and other musculoskeletal conditions

Musculoskeletal conditions are the main cause of impaired physical functioning globally (Vos et al., 2012, Woolf and Pfleger, 2003), and much of the care for these conditions is provided in PHC settings (Dziedzic et al., 2009). These conditions have high chronicity rates and often have a long term impact (Dziedzic et al., 2009), leading to reduced mobility and dexterity, chronic pain, reduced capacity for employment, and negative impact on family and social life.

The findings of the 2010 Global Burden of Disease study suggest that musculoskeletal disorders account for 6.8 per cent of disability-adjusted life years (DALYs) (Murray et al., 2012). Worldwide, 632 million people suffer from back pain, 332 million from neck pain, 251 million from osteoarthritis of the knee, and 561 million from other musculoskeletal disorders (Vos et al., 2012) (Table 1). Not surprisingly, many Australians are affected and the burden is substantial. According to AIHW (2014), “6.1 million Australians have arthritis or other long-term conditions (ABS 2012), and this number is expected to rise as the population ages” (p 2). In the Global Burden of Disease study, musculoskeletal disorders contributed 26.4 per cent of non-fatal burden in Australia, measured as years lived with disability (YLDs) (Institute for Health Metrics and Evaluation, 2013). Direct health expenditure for arthritis and other musculoskeletal conditions was \$5.7 billion in the 2008-2009 year (AIHW, 2014, p 2). Table 1 shows the prevalence of arthritis and musculoskeletal conditions in Australia.

Arthritis

Arthritis comprises over 100 chronic conditions that detrimentally affect movable joints by damaging joint structures such as cartilage, causing pain, inflammation, stiffness, and decreased mobility (AIHW, 2010b). The main two types of arthritis are:

- **Osteoarthritis**, the most common form, predominantly causes breakdown of articular cartilage in the hands, spine, hips, knees, and ankles (AIHW, 2010b). It is the most common disorder in the world, and it accounts for more hospitalisations than rheumatoid arthritis (Arden and Nevitt, 2006). It is the second most common cause of work disability in men over 50 years of age in the US (Arden and Nevitt, 2006). It is strongly correlated with ageing (Moskowitz, 2009).
- **Rheumatoid arthritis**, the second most common form, is a chronic autoimmune disease in which the immune system attacks synovial tissues, most often in the hands, causing pain, inflammation, and stiffness.

Arthritis is usually treated with medications (analgesics and anti-inflammatory drugs), supplemented by surgery (joint replacement [arthroplasty]) for more severe cases (AIHW, 2010a).

Table 1 Prevalence of musculoskeletal conditions in Australia

Condition	Prevalence
Arthritis	3.3 million (14.8% of population) had arthritis 2011-12 (ABS, 2012) 17.7% of women 11.8% of men 59.9% of women aged 75+ 42.3% of men aged 75+ 55.9% osteoarthritis (among people with arthritis) 13.6% rheumatoid arthritis 37.3% unspecified arthritis
Osteoarthritis	1 613 000 people (7.6% of population) (AIHW, 2010b) 5.3% of women 1.2% of men 22.8% of women aged 65+ 5% of men aged 65+
Rheumatoid arthritis	428 500 people (2% of population) (AIHW, 2010b) 2.4% of women 1.5% of men
Osteoporosis	726 000 (3.3% of population) in 2011-12 (ABS, 2012) 22.8% of women aged 65+ 5% of men aged 65+ 692 000 (3.4% of population) had doctor-diagnosed cases of osteoporosis in 2007-08 (AIHW, 2011) 81.9% of cases women 84% cases aged 55+
Back/neck problems	1.8 million 2007-08 (1 in 11 people) (AIHW, 2013b) 25% more common in Indigenous Australians 2004-05

Osteoporosis

Osteoporosis is a chronic disease characterised by abnormally reduced bone density, which weakens bones, making them brittle and vulnerable to fractures (Agency for Clinical Innovation, 2011). It is caused by a dysfunction of normal skeletal remodelling that causes bone tissue to be broken down faster than it can be replaced. It often has no obvious symptoms until a fracture occurs as a result of minimal trauma.

Minimal trauma fractures are relatively common. The Australian Dubbo Osteoporosis Epidemiology Study found that 44 per cent of women and 25 per cent of men aged over 60 experienced at least one such fracture in their remaining life. The corresponding figures for people with osteoporosis were 65 per cent and 42 per cent. In Sweden, a study using modelling based on patient records estimated the lifetime risk of fractures that commonly occur in osteoporosis (shoulder, forearm, hip, or spine) as 47 per cent for women and 24 per cent for men (Kanis et al., 2000).

People who have suffered fractures are at relatively high risk of further fractures (Ganda et al., 2013), and are also at risk of premature mortality (Bliuc et al., 2009). According to Bunta (2011), a fracture is

a sentinel event, signalling the need for proactive intervention to reduce subsequent risk. This is recognised in almost all evidence-based guidelines (Ganda et al., 2013). However, there is considerable evidence that this usually does not occur. A number of initiatives have been developed to address this problem (Ganda et al., 2013). An Australian model of post-fracture care is discussed in the 'Models of integration and collaborative care involving AHPs' section below (p 17).

The main treatments used in the management of osteoporosis are prescribed drugs and mineral and vitamin supplements to reduce bone loss (AIHW, 2010b). Prevention of falls is another integral component of management, to reduce the risk of fractures.

Goals of intervention

The goals of intervention in musculoskeletal conditions in general are primarily:

- pain relief
- improvement/preservation of quality of life
- prevention of disease progression
- preservation of function
- preservation of mobility
- prevention of deformity
- prevention of falls
- prevention of fractures
- weight management
- effective self-management
- functional rehabilitation (particularly after fractures and/or surgery)
- avoidance of hospitalisation
- avoidance of institutionalisation (for elderly people).

Goals for specific conditions vary somewhat. For example, according to the Agency for Clinical Innovation (2012b), the main goals of management of osteoarthritis of the hip and knee are:

- symptom control of pain and stiffness
- limitation of disease progression
- optimisation and maintenance of function
- optimisation and maintenance of quality of life
- effective use of health care (p 21).

Some interventions, particularly screening for osteoporosis, focus primarily on intermediate goals, particularly bone mineral density testing and prescribing and use of appropriate medications (e.g. bisphosphonates). Screening interventions are sometimes undertaken by pharmacists (see Appendix 1). Since people with musculoskeletal conditions often have complex needs requiring multiple treatments, coordination of care provided by a range of practitioners, with clear communication among healthcare providers, is very important.

GP and specialist consultations

GPs dominate the management of osteoarthritis, with more severe cases being referred to specialists (orthopaedic surgeons, rheumatologists, and geriatric specialists) (AIHW, 2010b). In the 2007-08 National Health Survey, 61.1 per cent of women and 33.8 per cent of men with osteoarthritis had consulted a GP or specialist in the previous year. Nearly one in eight (13.3%) did so annually, 17.9 per cent every six months, 29.3 per cent every three months, and 21.5 per cent at least once a month.

Specialists play a larger role in the management of rheumatoid arthritis (AIHW, 2010b). In the 2007-08 National Health Survey, 36.2 per cent of women and 44.1 per cent of men with rheumatoid arthritis had consulted a GP or specialist in the previous year, 9.4 per cent annually, 17.5 per cent every six months, 27.9 per cent every three months, and 23.8 per cent at least monthly.

GPs often manage osteoporosis in collaboration with specialists, particularly endocrinologists (AIHW, 2010b). In the 2007-08 National Health Survey, 38.2 per cent of women with osteoporosis and 39.2 per cent of men had consulted a GP or specialist in the previous year, 9.7 per cent annually, 16.1 per cent every six months, 28.1 per cent every three months, and 32.6 per cent at least monthly.

GP referrals

In 2008-09, GP referrals were made at the following rates per 100 problems managed (AIHW, 2010b) for the different musculoskeletal conditions (Table 2).

Table 2 GP referral rates per 100 problems for musculoskeletal conditions

Condition	Rate per 100 problems	Referrals to
Osteoarthritis	13.7	Orthopaedic surgeons (5.8/100) Physiotherapists (4.4/100)
Rheumatoid arthritis	13.6	Rheumatologists (8.8/100) Physiotherapists (2.1/100)
Osteoporosis	3.1	Endocrinologists (1.1/100) Rheumatologists (1.0/100) Physiotherapists (1.1/100)

Medications

Medications are the mainstay of GP treatment for each of the musculoskeletal conditions (AIHW, 2010b). Analgesics and non-steroidal anti-inflammatories (NSAIDs) predominate. Data from the 2008-09 BEACH survey indicate the number of medications that were prescribed, supplied, or advised per 100 problems managed (Table 3).

Table 3 Medications prescribed, supplied or advised for musculoskeletal conditions

Condition	Medications	Per 100 problems managed
Osteoarthritis	Analgesics Non-steroidal anti-inflammatories (NSAIDs)	85.8
Rheumatoid arthritis	Disease-modifying anti-rheumatic drugs NSAIDs Analgesics	99
Osteoporosis	Bisphosphonates (alendronate and residronates) Analgesics Supplements (calcium, vitamin D)	83.1

Although medications can significantly improve symptoms and quality of life, there are also significant problems related to drug use, including inappropriate prescribing of opioids (Leong et al.,

2009, Windmill et al., 2013) and underuse of osteoporosis drugs (particularly bisphosphonates). Polypharmacy (prescribing and use of multiple drugs) is also a problem, particularly in relation to benzodiazepines and other psychotropic drugs, which increase the risk of falls (Huang et al., 2012). In addition to the potential adverse reactions to individual drugs, there can also be adverse interactions among drugs (McCarberg and Tenzer, 2013).

Conservative management

Conservative management generally refers to non-surgical interventions. It includes medications and a wide range of other interventions such as exercise, hydrotherapy, and dietary modifications.

According to the Agency for Clinical Innovation (2012b), the strategies for conservative management of osteoarthritis are:

- self-management
- exercise
- weight loss
- psychological management
- pharmacologic assessment
- disease management education (p 21).

These can all improve function and quality of life, and in some cases they can slow the progression of disease.

Undertaken properly, conservative management is multidisciplinary, involving a range of AHPs as well as GPs and medical specialists. Unfortunately, however, there is substantial evidence of under-use of conservative non-pharmacological treatment (Agency for Clinical Innovation, 2012b, Agency for Clinical Innovation, 2014, AIHW, 2010b). For example, current management of osteoarthritis is “often limited to the use of analgesic and/or anti-inflammatory medication and cautious waiting¹³ for the eventual referral for total joint replacement” (Hunter, 2011, p 283). Consequently AHPs have little or no involvement in the management of many patients, despite good evidence of the benefits of their interventions.

Allied health practitioners

AHPs are important health care providers (Lowe, 2009). They generally work with individual patients/consumers, treating (and sometimes diagnosing) a wide range of health conditions. However, they also work with groups of patients/consumers, particularly in prevention, health promotion, rehabilitation, and aged care.

Definitions and lists of AHPs vary considerably (Australian Health Workforce Advisory Committee, 2006, Lowe, 2009). All definitions exclude doctors; and most but not all exclude nurses. Several professional groups, including physiotherapists, occupational therapists (OTs), and dietitians, all of which are commonly employed in hospitals, are included in most if not all definitions.

AHPs work in PHC settings, including general practices, community health centres, and aged care facilities, as well as hospitals, where they play a major role in rehabilitation. They also work in private practice, often as sole practitioners. Further information about specific AHPs and their roles is provided in Appendix 1.

A study of health promotion by UK AHPs (Needle et al., 2011) found that musculoskeletal disorders were the main conditions targeted (28%), followed by cancers (20%), and obesity (11%). Most of the health promotion undertaken was tertiary (promoting the health of people with chronic conditions

or disabilities, to enhance their quality of life and potential for healthy living) or secondary (promoting the health of people with established health problems, to prevent progression to more chronic and/or severe problems). This is very relevant to the goals of intervention in musculoskeletal conditions listed earlier.

There is a growing body of research about evidence-based practice by AHPs for musculoskeletal conditions. There is also research focusing on translation of evidence into practice. However, there are significant barriers to AHP research, including funding, fragmentation, diversity of settings, and the fact that AHPs often provide complex multidisciplinary interventions with outcomes that are difficult to measure (Needle et al., 2011).

Defining integration

There is a range of definitions available for integration and integrated care; some focus on the organisation of services across different sectors (e.g. vertical integration) while others focus on the interaction between providers within a sector (e.g. horizontal integration). The underlying principle, however, is that integration refers to bringing together multiple individuals and organisations representing different health sectors/fields to align practices and enhance access to good quality health care (Oliver-Baxter et al., 2013a). The World Health Organization (WHO) (2008) defines integration as follows:

The management and delivery of health services so that clients receive a continuum of preventive and curative services, according to their needs over time and across different levels of the health system (p 4).

Too often patients and health providers experience fragmentation of care; thus at the micro level the emphasis of integrated systems is on the patient experience (Oliver-Baxter et al., 2013b). The WHO (2008) report notes these differences in perceptions of integration among patients and health professionals:

For the user [patient], integration means health care that is seamless, smooth and easy to navigate. Users want a coordinated service which minimises both the number of stages in an appointment and the number of separate visits required to a health facility. They want health workers to be aware of their health as a whole (not just one clinical aspect) and for health workers from different levels of a system to communicate well. In short, clients want continuity of care (p 4)

For providers [health professionals], integration means that separate technical services (and their management support systems) are provided, managed, financed and evaluated either together, or in a closely co-ordinated way (p 4).

It must also be acknowledged that the term integration is often used synonymously with cooperation, collaboration and coordination. However, these concepts differ. Strandberg-Larsen (2011) described coordination as an activity and integration as a performance outcome (Figure 1).

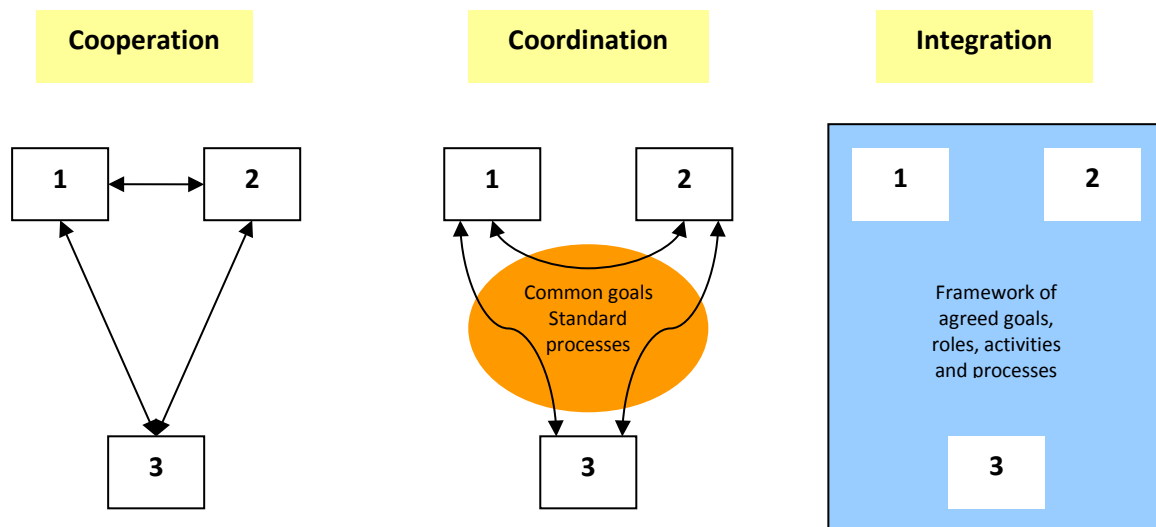


Figure 1 Level and intensity of interactions between health care organisations in cooperation, coordination and full integration frameworks

This distinction was reinforced in a Canadian study which assessed integration between complementary and alternative medicines and conventional health care practices. Participants from academia, administration, chiropractic care, medicine, midwifery, nursing and physiotherapy defined integration and collaboration:

Participants viewed integration as a more formal relationship where different health care professionals were subsumed under a common policy, administration, formal structure, and sharing a common vision of care delivery. Alternatively, collaboration was described as health care providers working together but maintaining their autonomy in the absence of formal structure and processes for the delivery of patient care (Mior et al., 2010, p 681).

Although multidisciplinary teams are common among GPs and AHPs in PHC, this more commonly entails a sense of collaboration; it is only since the National Primary Health Care Strategy was introduced in 2010 that the focus has been on integration (Commonwealth of Australia, 2010), which is explored in this report.

Aim and research questions

With an understanding based on the *National Primary Health Care Strategy* (Commonwealth of Australia, 2010) that there is a need to improve the engagement and integration of AHPs into PHC, this review aims to explore: a) the value of integration of AHPs in the treatment and management of arthritis and other musculoskeletal conditions; and b) health care models and mechanisms (including training and incentive programs) that are likely to improve engagement and promote integrated practice.

Although there is some evidence internationally relating to collaborative care models for specific chronic conditions such as heart failure, there has been limited evaluation of the literature on models specific to musculoskeletal conditions. This report therefore identifies and summarises evidence related to models and mechanisms for the engagement of AHPs in collaborative care for musculoskeletal conditions (a national health priority area) based in the PHC sector.

Specific research questions and areas addressed include:

- 1 What are the patterns of AHP involvement in chronic disease collaborative care in general practice in Australia, particularly in relation to arthritis and other musculoskeletal conditions?
- 2 What are the likely benefits of AHP involvement in chronic care for arthritis and other musculoskeletal conditions (quality of life, self-management, hospital admission/readmission rates, admission to residential aged care facilities, economic impacts etc.)?

In relation to arthritis and other musculoskeletal conditions specifically:

- 1 What published models of allied health care integration into GP networks and GP Super Clinics are there?
- 2 What kinds of mechanisms have been suggested to improve integration between AHPs and GP networks and GP Super Clinics?
- 3 What evidence is there for effective incentives to integration?
- 4 What are the barriers to integration between AHPs and GP networks and GP Super Clinics?
- 5 What approaches have been or are being trialled to overcome these barriers?

Methods

This report follows a 'rapid review' format. Rapid reviews are short literature reviews that focus on research evidence, with a view to facilitating evidence-based policy development (Grant and Booth, 2009). Due to the limited timeframe for this review (8 weeks), searches and critical appraisal of the literature were pragmatic rather than systematic. In order to obtain the most relevant material quickly, search terms varied across different databases. Consequently, replication of this review may result in a different literature base.

A selection of relevant academic databases was searched: PubMed, the Cochrane Library, CINAHL (Cumulative Index to Nursing and Allied Health Literature), the Informit databases (including Australasian Medical Index and AgeLine), and Google Scholar. Search terms are detailed in Table 6 in Appendix 2.

In order to obtain evidence from the most recent examples of integration efforts, literature searches were generally restricted to the period from 2009 to 2013. The emphasis was on Australian literature but, where appropriate, international literature was included, focusing on countries with comparable systems and priorities to Australia. Only English language sources were included. Searches were restricted to adult populations and musculoskeletal conditions recognised as a National Health Priority (i.e. osteoarthritis, rheumatoid arthritis, osteoporosis)¹. Since the emphasis was on PHC and community settings, interventions with hospital inpatients were excluded.

For the purposes of this review, AHPs refers to those health professionals recognised by the peak body, Allied Health Professions Australia (AHPA <http://www.ahpa.com.au/>): audiologists, chiropractors, dietitians, exercise physiologists, genetic counsellors, music therapists, OTs, orthoptists, orthotists/prosthetists, osteopaths, perfusionists, pharmacists, physiotherapists, podiatrists, psychologists, social workers, sonographers, speech pathologists. However, the literature search was limited to those AHPs that have a role to play in the treatment and management of arthritis and musculoskeletal conditions in PHC. For example, perfusionists, who perform a highly specialised function in cardiac surgery, were excluded from the review, as were sonographers and genetics counsellors, because they are usually hospital-based. Current AHPA affiliate AHPs, namely audiometrists, diabetes educators, diversional therapists and practice managers, were also excluded.

Limitations of the review

The literature search was challenged by lack of specificity. Searches for 'integration' and similar terms (e.g. 'collaboration', 'multidisciplinary', and 'interprofessional') located large numbers of sources that mentioned those terms but often did not provide any relevant information. Furthermore, terms such as 'collaborative' often refer to communication and liaison between GPs and specialists, rather than teamwork that includes AHPs.

When AHPs are involved in collaborative care, it is common in the literature for terms such as 'multidisciplinary team' to be used without explanation or explicitly identifying specific AHPs. In relation to this, Needle et al. (2011, p 46) reported:

In twelve instances (17%) it was unclear what the lead profession was; many of these referred to a Multidisciplinary Team without specifying roles within it.

¹ <https://www.health.gov.au/internet/main/publishing.nsf/Content/pq-arthritis>

Findings

General comments

Unfortunately there is limited information about the use of AHPs by people with musculoskeletal conditions. One key reason for this may be that the main sources of statistics about AHP services are Medicare and hospital data. Many AHP services are not publicly funded – costs are usually borne by patients themselves, sometimes with assistance from private health insurance (AIHW, 2010b) – and therefore are not captured in Medicare or hospital statistics. Consequently, the Australian Institute of Health and Welfare (AIHW) uses information from GP surveys and hospital data wherever possible, and makes it clear in its reports that it recognises that this information does not cover the majority of relevant AHP activity. This reflects a more general lack of PHC data (AIHW, 2013c).

According to AIHW (2014, p 23):

There is currently no national data source for the range of allied health care interventions or self-management advice recommended for treating musculoskeletal conditions (for example, physiotherapy, provision of insoles, taping, physical exercise).

The limitations about primary health care information for musculoskeletal conditions are part of a broader concern with the relative lack of primary health care information in Australia. Primary health care has not experienced the same national focus on data capture, collation and reporting as other parts of the health system.

Furthermore, there is a marked lack of detail in the limited AIHW statistics that are available.

Limitations include:

- lack of information linking health conditions to AHP consultations
- generic statistics about GP referrals to AHPs (not specifying which AHPs)
- survey limitations (including very small sample sizes and high relative standard errors).

In relation to juvenile arthritis, AIHW (2008c) includes statistics on specific AHP consultations by children (p 18²). However, there is no equivalent table or other summary for adults in any AIHW publication. The lack of ready access to such statistics hampers assessment of the extent of AHP involvement in the management of musculoskeletal conditions.

Patterns of AHP involvement in collaborative care for musculoskeletal conditions

Despite the lack of data confirming the figures, consistent evidence indicates that AHPs play a major role in the management of arthritis and other musculoskeletal conditions, both in hospitals and in the community. Many people access AHP treatment in addition to treatment by doctors. There is a plethora of guidelines recommending the involvement of AHPs in multidisciplinary teams for the management of musculoskeletal disorders (see Appendix 3).

However, adherence to guidelines is far from optimal. In particular, there is evidence of underuse of AHP services, both in Australia (Brand, 2007, Brand et al., 2011, Department of Health, 2009) and elsewhere. This includes joint replacement without prior AHP treatment (Agency for Clinical Innovation, 2012b). The causes appear to be systemic. Reviewing the translation of Australian osteoarthritis policy into service models, Brand et al. (2011) concluded that implementation of models has been patchy rather than planned, partly because of sporadic government funding.

² Table 3.5: Allied and other health professional consultations by children with arthritis, 2004–05

It is stipulated in best practice guidelines that teamwork be an integral part of musculoskeletal care. For example, in a discussion of osteoarthritis management options suggested by the Royal Australian College of General Practitioners' (RACGP) Guideline for the non-surgical management of hip and knee arthritis, McKenzie and Torkington (2010) emphasised the importance of multidisciplinary collaboration to provide patients with access to a wide range of non-pharmacological interventions. They referred to physiotherapists, OTs, massage and manual therapists, personal trainers, exercise physiologists, dietitians and nurses who may be able to support patients; and GPs, pharmacists, rheumatologists and surgeons who can support pharmacological management. They proposed that practice nurses and AHPs can be particularly useful for developing care plans and suggested that GPs may be well placed as gatekeepers to review multidisciplinary care as part of regular follow-up of patients.

Pharmacists are frequently accessed by patients in a dispensary role (i.e. in order to supply and maintain medications, both prescribed and over-the-counter). Medications are the most common strategy used by GPs to manage osteoarthritis (Agency for Clinical Innovation, 2012b, AIHW, 2010b); and for rheumatoid arthritis, medications are prescribed (or advised or supplied) at a rate of 99 per 100 rheumatoid arthritis problems managed (AIHW, 2010b). However, the fact that pharmacists dispense these medications does not necessarily mean that they play any other role in management or that they are part of a collaborative team.

Apart from pharmacists, the main AHPs involved in management of musculoskeletal disorders are physiotherapists (who dominate service provision), OTs, chiropractors, podiatrists, and social workers (AIHW, 2010b). For osteoarthritis and osteoporosis, physiotherapists tend to receive more referrals from GPs or specialists than other AHPs do (AIHW, 2010b). For rheumatoid arthritis, most GP referrals are to specialist doctors (particularly rheumatologists), who play a substantial role in management. In relation to arthritis, the AIHW's (2008a) management framework features AHPs (physiotherapists, OTs, podiatrists, osteopaths, and massage therapists) as potential first points of contact by patients/clients, as providers of medications and related information (pharmacists), and as providers of hospital services and post-operative care.

The roles of AHPs in the management of musculoskeletal conditions are diverse, but mainly focus on improving physical functioning. Psychologists have a major focus on psychological wellbeing, which may also be boosted by improvements in physical functioning.

Utilisation of AHP services

There is a paucity of recent information about the use of AHPs by Australians with musculoskeletal conditions. However, the AIHW (2010b) usefully summarises relevant data from the 2007-08 National Health Survey (NHS) and the BEACH 2008-09 Survey (Britt et al., 2009, p 10):

Osteoarthritis:

- An estimated 7.9 per cent of people with osteoarthritis reported visiting allied/other health professionals in the 12 months before the 2007–08 NHS survey
- Chiropractors/podiatrists and physiotherapists/hydrotherapists were consulted by two per cent of the survey respondents
- The BEACH survey indicates that in 2008–09, osteoarthritis referrals were made at a rate of 13.7 per 100 osteoarthritis problems managed, 56 per cent of these being to medical specialists (particularly orthopaedic surgeons) and 42 per cent to allied health services (particularly physiotherapists).

Rheumatoid arthritis:

- AHPs help people with rheumatoid arthritis improve joint functioning as well as develop skills for self-care. Chiropractors, podiatrists, physiotherapists and hydrotherapists may also be consulted by people with rheumatoid arthritis of their own accord or on a clinician's recommendation (p 20)
- Almost 1 in 12 people with rheumatoid arthritis (8.6%) reported seeking help from an AHP in the 12 months prior to the 2007-08 NHS. Chiropractors/podiatrists and physiotherapists/hydrotherapists were consulted by less than two per cent of people with rheumatoid arthritis (p 20)
- The BEACH survey indicates that in 2008–09, rheumatoid arthritis referrals were made by GPs at a rate of 13.6 per 100 rheumatoid arthritis problems managed. Of this, referrals to physiotherapists were made at a rate of 2.1 per 100 rheumatoid arthritis problems managed (p 20).

Osteoporosis:

- AHPs contribute to the management of osteoporosis mostly following fractures. Chiropractors, podiatrists, physiotherapists and hydrotherapists may be consulted by people with osteoporosis of their own accord or on a clinician's recommendation (p 28)
- Almost 12 per cent of people with osteoporosis reported seeking help from an AHP in the 12 months prior to the 2007–08 NHS (p 28).

Equivalent data are not yet available from the Australian Health Survey 2011-13 (<http://www.abs.gov.au/australianhealthsurvey>), which has replaced the NHS.

A UK study investigated the tendency for people living with hip or knee pain to consult health care professionals, and their reasons for doing so. Of the 1 119 participants in the study, 25 per cent had seen a doctor only, three per cent an AHP only, four per cent an alternative therapist only, 13 per cent had seen more than one category of health care professionals, and 55 per cent had not sought help (Thorstensson et al., 2009). Disability seemed to be more important than pain severity as a motivating factor for seeking help. In addition, AHPs are accessed less frequently by people living in rural and remote areas, partly as a result of shortages of AHPs in those areas (Lowe and Lawrance, 2005).

Benefits of AHP involvement in collaborative care

AHP involvement in management of musculoskeletal conditions offers many benefits, particularly in the longer term. Most people with musculoskeletal disorders require medication, and some require surgery, but most have other needs that AHPs can assist with, including: recovery, maintenance, and preservation of function; pain management; self-care and independent living; weight loss and maintenance; education and self-management supports; and falls prevention.

Musculoskeletal conditions are often multifaceted. Therefore, patients require support from multidisciplinary teams. There have been concerns about GPs' limited knowledge of the specifics of musculoskeletal conditions (Pollard et al., 2011); hence it has been suggested that "multidisciplinary working potentially enables clinics to provide a level of patient benefit that collectively is greater than the sum of the individual team members' contributions" (Harding et al., 2010, p 7). For example, clinical practice guidelines from the RACGP, the UK National Institute for Health and Care Excellence (NICE; previously the National Institute for Health and Clinical Excellence), and the Osteoarthritis Research Society International all recommend multidisciplinary care in osteoarthritis

management (March et al., 2010). NICE guidelines for the management of osteoarthritis recommend that all patients should have access to information, advice, education, exercise and nutrition resources. Again, this reinforces the need for multifaceted, collaborative approaches (Dziedzic et al., 2009).

Furthermore, integrating AHPs encourages the application of biopsychosocial models of care rather than adherence to traditional biomedical models (Dziedzic et al., 2009, Riva et al., 2010). Given that the current focus of health services is on being patient-centred and addressing the social determinants of health, collaborative care models have the potential to address both of these.

Patient experience of multidisciplinary teams

Although there are good reasons to promote multidisciplinary teamwork in musculoskeletal conditions, there is a need for caution. It is important to recognise that multidisciplinary care is not necessarily embraced by patients, and may even be perceived as detrimental. For example, an Australian study by Maneze et al. (2014) found that few patients with diabetes felt that the involvement of many health professionals improved the control of their diabetes. Patients reported fragmented and conflicting communication, and inconvenience (including increased travelling and waiting and the need to repeat their medical histories).

Consistency of approach is important for chronic disease management in general (NSW Department of Health, 2006). Multidisciplinary teams are a common component of models of care for a range of conditions including diabetes, chronic obstructive pulmonary disease and heart conditions; and for optimal chronic disease management generally. This approach enables use of such concepts as consistent messaging, shared care plans, and care coordination (NSW Health, 2014). However, there has been relatively little research on patients' perspectives of multidisciplinary collaboration, including patients with arthritis and musculoskeletal conditions. A qualitative study of the experiences of Australian patients with asthma found that they recognised the potential benefits of multidisciplinary care, but most did not perceive a need for it themselves (Cheong et al., 2013).

Models of integration and collaborative care involving AHPs

Types of models

Models of AHP integration vary in their focus, including:

- specific conditions: musculoskeletal conditions generally, arthritis, osteoarthritis, rheumatoid arthritis, osteoporosis, chronic back pain
- early intervention
- acute care
- rehabilitation
- maintenance
- self-management
- extended practice roles for specific AHPs (particularly physiotherapists, and to a lesser extent OTs) (Warmington et al., 2011).

In many cases, multifaceted programs that are offered in PHC settings target the needs of patients by trying to extend the role of GPs or practice nurses rather than engaging professionals who are already trained in the required areas of need. In contrast, collaborative care models encourage teamwork from health professionals who already have the skills, with health professionals working either directly with the patient or one group of service providers training another (e.g. physical therapists or physiotherapists in self-management or GPs in exercise activities) (Dziedzic et al., 2009).

Health organisations in Canada refer to a number of different structured models (Table 4) for arthritis care (Davis et al., 2010). These models are similar to approaches in Australia and include a range of health professionals in both the primary and acute care sectors. Nevertheless, different models reflect different roles for integrated teams such as informing models of care, educating patients in relation to self-management, or encouraging inter-professional education. For example, in terms of informing models of care, Western Australian (WA) groups of cross-disciplinary stakeholders have been developed to work collaboratively with specific populations or in relation to specific conditions. These health networks are responsible for developing evidence-informed 'Models of Care' (MoCs), including four established by the WA Musculoskeletal Health Network (Briggs et al., 2012) (see p 21 for more details). Briggs et al. (2014) defined a MoC as “an evidence-informed policy or framework that outlines the optimal manner in which condition-specific care should be made available and delivered to consumers” (p. B). They advocated a 'health network' approach to the development and implementation of MoCs, in which large networks of stakeholders, including multidisciplinary health practitioners and policy makers, supported by central government agencies, work collaboratively from the outset to develop evidence-based MoCs with broad stakeholder support.

Table 4 Structure of arthritis models of care in Canada

Type of Model	Structure of Model
Traditional primary care physician (often working in team-based practice) to specialist referral loop	Primary care physicians assume overall responsibility for care whereas the specialist (usually a rheumatologist or orthopaedic surgeon) provides their specialised services with ongoing care managed in primary care or Shared care model where the specialist sees the patient in limited review with ongoing primary care management
Specialised arthritis, multidisciplinary team-based care	Team provide care to people across the continuum of care and spectrum of disease severity
Rural and remote access models with telemedicine and visiting provider mechanisms	Local providers are relied upon to coordinate and provide ongoing management with input from a specialist via technology or infrequent in-person consultation
Triage models using health care providers in expanded roles	Health providers often working in expanded roles are used to facilitate priority access to a specialist
Community-based models	Community programs provide services that are limited or not available in the formal health care system with the goal of promoting wellness, self-management and risk reduction

Source: Davis et al. (2010, p 3)

There are few Australian models described in the literature. Brand et al. (2011) concluded that there have been very few models developed specifically for osteoarthritis, and that there was a lack of evidence about those that had been developed:

Clinical practice guidelines provide a strong evidence base for effectiveness of specific interventions, but there is little to guide healthcare providers in determining cost-effectiveness of the ways in which care is 'packaged' and service is 'delivered' (p 184).

Marion and Balfe (2011, p S25) made similar comments from a US perspective:

Various multidisciplinary models of rheumatoid arthritis care have been described in the literature. Whereas the case for implementing such models is underscored by the chronic nature of the disease, by its comorbidities and complications, and by barriers to patient medication adherence, cost-effectiveness analyses to document benefits of coordinated interprofessional rheumatoid arthritis care are lacking. Most studies on interprofessional care in rheumatoid arthritis are relatively old and have been conducted outside of the United States. Nonetheless, the findings are still relevant and may shed light on potential avenues for the development of new models in this country.

Insights from models from Australia and around the world

Examples of models illustrating integrated care for musculoskeletal conditions are provided in Table 7 (Appendix 4).

Osteoarthritis Chronic Care Program

In NSW, the Osteoarthritis Chronic Care Program (OACCP) is a multidisciplinary conservative management model that was developed by the ACI Musculoskeletal Network to address the divergence between evidence-based, guideline-informed practice and usual clinical practice, particularly in relation to the underuse of conservative non-pharmacological interventions (Agency for Clinical Innovation, 2012b). Its objectives are to reduce pain and improve function and quality of life for patients who have elected conservative management or are waiting for elective surgery. It has been running since 2011 (initially at seven pilot sites).

From 2011 to June 2013, two-thirds of participants on waiting-lists for knee or hip replacement reported having received no non-pharmacological management prior to their initial OACCP assessment (Agency for Clinical Innovation, 2014). The most common interventions received were physiotherapy (17%), exercise (13%), podiatrist/orthotist/mobility aid (7%), and dietitian/weight loss (4%). Strikingly, 12 per cent of Wollongong participants had received OT/home modifications, compared with 0.3 per cent of other participants, suggesting the influence of local non-clinical factors.

The OACCP is delivered by multidisciplinary teams led by musculoskeletal coordinators, who are physiotherapists with extensive experience in management of musculoskeletal disorders (Agency for Clinical Innovation, 2012b). Other team members may include:

- GP as leader of the individual's health care and their practice staff
- Specialist doctors from the fields of medicine and surgery
- Physiotherapists (in addition to the Coordinator)
- Nurses
- Occupational Therapists
- Dietitians
- Psychologists
- Social Workers
- Pharmacists
- Exercise Physiologists
- Podiatrists
- Others as identified as necessary (p 22).

Patients can be referred by any health professional, including GPs and AHPs. Self-referral is permitted, subject to medical assessment, for which assistance is provided. All patients are assessed face-to-face at entry and at 12, 26, and 52 weeks.

Three main care options, which can be combined, are available within the OACCP:

- multidisciplinary services at central health service sites (e.g. physiotherapy department, outpatient clinic, or community health service)
- community services (e.g. GP clinic, phone counselling service); possibly part-funded by a GP Management Plan (GPMP, Medicare item 721), sometimes supplemented by phone counselling
- self-directed interventions, guided by regular phone counselling (weekly or more frequent).

The program has had some promising results in terms of patients being removed from surgical waitlist for knee replacement (10% of patients) and hip replacement (4.5%) (Agency for Clinical Innovation, 2014). Patients are also escalated to surgery, particularly hip replacement, when appropriate. Evaluation of data from July 2011 to June 2012 demonstrated positive improvements in balance and functional mobility (assessed by the Timed Up and Go test) for both hip patients (44%) and knee patients (39%) (Agency for Clinical Innovation, 2012c). There were positive findings for weight reduction or maintenance (80% of patients), and most patients (90%) reported being satisfied or very satisfied with the program.

There is also evidence of potential cost-effectiveness. A fiscal and utilisation analysis of 10 year projected costs and outcomes estimated that if the OACCP was implemented state-wide:

- 40 404 bed-days could be freed up
- approximately 5 647 patient separations could be avoided
- \$134.6 million in costs could be avoided (Agency for Clinical Innovation, 2013).

Osteoporotic Refracture Prevention

Also developed in NSW by the ACI Musculoskeletal Network, the Osteoporotic Refracture Prevention (ORP) model of care aims to improve the care of people aged over 50 who have suffered a minimal/low trauma fracture, in order to reduce the risk of subsequent fractures (Agency for Clinical Innovation, 2011). The ORP is underpinned by RACP (2010) *Clinical guidelines for the prevention and treatment of osteoporosis in postmenopausal women and older men* and the *National osteoporosis next fracture prevention program: scoping study final report* developed by Osteoporosis Australia (2009) for the Department of Health and Ageing (cited in Agency for Clinical Innovation, 2011, p 12).

Case management is central to the ORP. It is provided by dedicated Fracture Liaison Coordinators, who are located at strategic sites across their Local Health Networks. As well as being directly involved in patient care (including education and support for self-management), they ensure that patients are linked with other services such as chronic care, primary care, community-based lifestyle services, and falls prevention services (Agency for Clinical Innovation, 2011).

The key elements of the ORP (with the responsible players in brackets) are:

- Active case identification by healthcare professionals of all specialties and disciplines across acute, outpatient, community and primary healthcare settings (Local Health Networks, Medicare Locals)
- Care coordination/case management through Fracture Liaison Coordinators to support individuals to access appropriate care (Local Health Networks)

- Development, implementation and regular evaluation of care pathways (ACI and Local Health Networks)
- Development of Service Dictionaries in local areas (Local Health Networks, Medicare Locals)
- Recruiting and engaging community resources in order to have multiple opportunities for appropriate interventions for those requiring care (Local Health Networks)
- Reporting of key performance indicators (KPI) and a core set of clinical indicators (CI) (Local Health Networks)
- Development and implementation of an electronic data system to record the KPIs and CIs that can be viewed and analysed both locally and centrally at the ACI (Agency for Clinical Innovation, 2011, p 20).

In addition to secondary and tertiary services, AHPs in PHC settings are involved in most elements of the program, including case identification (Agency for Clinical Innovation, 2011). Medicare Chronic Disease items that allow each patient to receive up to five AHP interventions a year can be used to offset costs in the community.

Inflammatory Arthritis Model of Care

In WA, the Musculoskeletal Health Network has developed four MoCs for inflammatory arthritis (IA), spinal pain, osteoporosis, and elective joint replacement (Briggs et al., 2012). Each MoC is "a state-wide, evidence-informed policy that clearly articulates a framework for consumer-centred health service delivery (the *right care*, at the *right time*, by the *right team*, in the *right place*)" (p 3).

The Inflammatory Arthritis Model of Care (Department of Health, 2009) was developed by a multidisciplinary team, drawing on evidence used in national and international guidelines. Among the deficiencies identified in existing services was underutilisation of AHP services, due to "inadequate access and shortcomings in communication and funding" (p 7). A key recommendation was that:

Adults and children with IA should have access to a multidisciplinary team (MDT) close to home to assess their needs and provide equitable access to appropriate intervention [Recommendation 5]... The MDT should comprise (at least) a physiotherapist, occupational therapist, nurse specialist, and social worker (p 22).

Also recommended were extended scope of practice for physiotherapists, OTs, and pharmacists.

Implementation strategies included:

- identification of essential disease-specific knowledge and clinical skills required by community-based physiotherapists
- learning modules for physiotherapists in clinical service delivery
- learning modules for all health professionals in delivery of self-management programs
- online resources for the effective self-management of musculoskeletal pain (Briggs et al., 2012, p 6).

In the related WA Spinal Pain Model of Care, Slater et al. (2012) found that an inter-professional pain education program for GPs increased their reporting of evidence-based attitudes, beliefs, and clinical behaviours. This included frequent mention of psychologists and physiotherapists two months post-intervention.

Musculoskeletal Services Framework

In the UK, musculoskeletal condition management is often provided by multidisciplinary Clinical Assessment and Treatment Services (CATS) which operate at the primary-secondary care interface but are coordinated by Primary Care Trusts (i.e. UK PHCOs). These CATS stemmed from the 2006

Musculoskeletal Services Framework (MSF) established by the UK Department of Health (2006). CATS include extended scope practitioners (most often physiotherapists):

Experienced clinical professionals who have developed their skills and knowledge in a defined area who are working beyond the usual scope of practice for the specific profession including undertaking tasks previously undertaken by other healthcare professionals (p 54).

The MSF (see Figure 2, Appendix 5) provides one example of a collaborative approach to musculoskeletal care. An application of this framework (the Newcastle West Musculoskeletal Pilot Pathway) is included in Table 7 (Appendix 4).

The Arthritis Program

The Arthritis Program (TAP) in Ontario has offered a model of inter-professional practice for over 25 years (Bain et al., 2012). The TAP team includes a range of health professionals (i.e. clinical and medical coordinators, OTs, physiotherapists, pharmacists, social workers, a dietitian, kinesiologists, rheumatologists, volunteers and administrators). The patient-centred model of practice adheres to some key principles which emphasise the importance of multidisciplinary teamwork (Table 5) and reflect the program’s “one patient, one chart” model. Referrals to the program come from physicians, rheumatologists or surgeons. Patients undergo a detailed initial history assessment administered by one of the team members before the decision is made as to whether they require a consultation with a rheumatologist in addition to the formalised education and comprehensive care programs offered to improve self-management. These programs are based on a self-efficacy framework with patients empowered to maintain their own health. A systematic set of outcome measures is used to monitor patients and assess their achievement of milestones. All patients receive follow-up contact, either face-to-face or via phone/email.

Table 5 TAP’s patient-centred care model

<ul style="list-style-type: none"> • All health professionals use the full scope of their profession-specific skills; overlap their roles with those of others on the team and share skills; share decision-making; and understand and trust the capabilities of all team members
<ul style="list-style-type: none"> • Systematic processes are used to ensure that clinical skills are cross-validated amongst the team members, fostering trust amongst the team members
<ul style="list-style-type: none"> • A shared vision for recognising the importance of early identification and treatment of arthritis
<ul style="list-style-type: none"> • Share values for helping patients gain access to care [shortened waiting times, appropriate disciplines], based on improved access to members of the inter-professional team
<ul style="list-style-type: none"> • Effective care using best-practice standards and guidelines
<ul style="list-style-type: none"> • Efficient use of resources

Source: Bain et al. (2012, p e84).

According to a descriptive study, TAP has over 10 000 outpatient patient visits per year, potentially reducing costs to hospitals that would be endured with inpatient treatment (Bain et al., 2012). The program has also reduced waiting times as patients engaged in TAP typically receive an assessment by a team member within two weeks and a rheumatologist consultation within four weeks. Quality evaluations of TAP using pre- and post-program questionnaires with participants attending the inflammatory education program recorded improvements in patients’ perceived self-efficacy to manage their condition, cope with pain and maintain functioning; and positive outcomes were also recorded based on standardised disease and activity measures (Mierdel, 2006).

Advanced Clinician Practitioner in Arthritis Care

One model that focuses on professional development of specific AHPs is the Advanced Clinician Practitioner in Arthritis Care (ACPAC) program in Toronto, Ontario (Warmington et al., 2011). Licensed physiotherapists and OTs are trained in the assessment, diagnosis, triage, and management of musculoskeletal and arthritis-related conditions, preparing them for extended practice roles. Another aim is to “facilitate the development of innovative models of arthritis care across various clinical settings in Ontario” (p iii). ACPAC began in 2005, and by 2011 there were 37 graduates. Warmington et al. (2011) reported that the extended role practitioners were having a positive impact on arthritis care in Ontario. However, Lundon et al. (2012, p 401) reported that there were significant barriers:

Issues relating to ACPAC graduate role recognition, as well as their deployment, integration and institutional support, including access to medical directives, limitation of scope of practice, remuneration conflicts and tenuous funding arrangements were barriers perceived to affect role implementation and interprofessional working.

Cost-effectiveness

There is some promising preliminary evidence of potential cost-effectiveness in Australia. Projections for the NSW OACCP (discussed above) suggest that state-wide implementation could yield substantial reductions in bed-days, hospital separations, and overall costs (Agency for Clinical Innovation, 2013).

However, some international models have been found not to be cost-effective. For example, a Finnish randomised controlled trial assessed the impact of a multidisciplinary rehabilitation program following primary total knee arthroplasty (Kauppila et al., 2011). The 10-day program involved treatment, education and support from physicians, physiotherapists, psychologists, social workers, nutritionists and orthopaedic surgeons. There were overall benefits of rehabilitation generally, but there were no significant differences in effectiveness in relation to faster functional recovery or improved quality of life after the multidisciplinary outpatient rehabilitation ($n = 44$) in comparison with conventional care ($n = 42$) that included a standard amount of physiotherapy. Furthermore, conventional care was cheaper and therefore more cost-effective than the multidisciplinary model (Kauppila et al., 2011).

This parallels results from the evaluation of a randomised controlled trial of a multifactorial falls prevention program for community-dwelling older adults. This Ontarian program involved assessments by geriatricians, geriatric nurses and physiotherapists and referrals to other health professionals such as vision experts and podiatrists. In comparison with usual care ($n = 160$), there were no statistically significant differences in fall-related outcomes for the multifactorial program ($n = 116$). Moreover, the program was not cost-effective when analysed using the traditional incremental cost-effectiveness ratio and the net benefit regression framework (Jenkyn et al., 2012).

Barriers to AHP integration in arthritis/musculoskeletal care

Complex systems

At the macro level, complex systems present a barrier to AHP integration in musculoskeletal care. That is, in Australia there are complex funding arrangements with state governments responsible for hospital funding, and the Federal government leading PHC funding. This makes initiatives trying to integrate across sectors particularly difficult, as the parties involved face different governmental priorities depending on the sector (Cunningham et al., 2012). Furthermore, in terms of

musculoskeletal conditions, often the practitioners involved in team-based care are spread across primary, acute and tertiary sectors, all with different governance models and approaches.

Similarly, there are both public and private funding systems in Australia. It has been suggested that it can be hard to engage private GPs and AHPs in care networks. This may also be associated with health insurance packages as some patients have their allowed AHP visits capped which may decrease their willingness to see multiple professionals and their ability to access a wide range of services (Westby and Backman, 2010). In addition, March et al. (2010) argue that an integrated model of care for people with osteoarthritis requires both promotion/prevention and disease management/rehabilitation activities and that separate funding streams may be a potential barrier.

Workforce

Building partnerships across disciplines is a long-term process that requires engaging key stakeholders, building trust, and developing methods of effective communication. Each of these is affected by high numbers of part-time positions and frequent staff turnover which is common among AHPs (Westby and Backman, 2010). The lack of appropriate multidisciplinary education in undergraduate programs is an additional barrier (Lowe and Lawrance, 2005).

Technology

Currently, GPs are being encouraged to set up Personally Controlled Electronic Health Records, but many AHPs do not yet have the facilities to do the same. Poor referral processes have been identified as a barrier to integrated care but new electronic health record systems could make the referral process much more efficient if all health providers gained access to the technology (Marion and Balfe, 2011, Pollard et al., 2011). The continued support of the National Broadband Network and electronic health records will encourage the use of technology and ability to share resources.

One example of a successful model is the New Zealand HealthPathways program. The program operates across primary, secondary and community care and includes HealthPathways (local agreements on best practice), an electronic request management system (to manage referrals), and HealthInfo (patient-centred website that explains the best practice agreements). In relation to the electronic request management system, it was designed to replace faxes or letters and is used to request tests, deliver referrals or receive specialist advice. Data move through a central repository and are re-routed to the appropriate source. The comprehensive system is installed on the GP's desktop and referrals are pre-populated from the GP's clinical system; 70 per cent of referrals now operate through this system. Furthermore, the HealthPathways program employs an electronic shared care record view. This is a portal that draws on available hospital and general practice data to offer a summary care record which is available across general practice, community nursing, pharmacy and hospital. It was developed following the Christchurch earthquake when patient data were inaccessible; with this new system, patients avoid having to repeat their history, and health professionals have immediate access to records (Ministry of Health, 2012, Timmins and Ham, 2013).

Lack of rewards/incentives

The fact that many AHP services are not included in Medicare or otherwise publicly funded (AIHW, 2010b) is a major barrier to AHP integration. Even when some rebates are available, as in the Enhanced Primary Care (EPC) program (discussed below in Mechanisms that enable integration, p 25), they are often too limited for optimal treatment. Inequity in access to Medicare benefits has been identified as a barrier, particularly for case conferencing. However, despite the lack of access to Medicare Benefits Schedule (MBS) items, AHPs in GP Super Clinics "reported willingness to

participate in case conferences in the interest of patient care and their professional learning” (Australian Government Department of Health and Ageing, 2012, p 45).

Some programs that have been trialled have been hampered by misalignment between program goals and jurisdictional funding priorities and responsibility. For example, the Osteoarthritis Clinical Pathway Project, which was funded under the Commonwealth AMQuIP program, was not sustainable because state government priorities resulted in it being implemented primarily in acute public hospital settings rather than PHC settings (Brand et al., 2011). Furthermore, lack of incentives has been identified as a barrier to inter-professional care for arthritis (Marion and Balfe, 2011).

Lack of knowledge

Successful integration relies on a clear understanding of each partner’s roles and responsibilities. Despite working with patients experiencing the same musculoskeletal conditions, there seems to be a lack of understanding of different AHPs’ capacity, explanations for conditions, and guidelines for best practice (Pope, 2009). In some cases, a lack of understanding about the profession has been reinforced by their media portrayal. For example, there has been controversy around the impact of chiropractors’ treatment, particularly of children, with opposition from the Australian Medical Association and negative messages presented in the media (e.g. Bramwell, 2013). It has been noted that when there is a lack of understanding from GPs about the roles of AHPs, there are often fewer referrals (Middlebrook and Mackenzie, 2012). Furthermore, in some cases there may be overlap in terms of the kinds of supports different practitioners can offer, and these ‘blurred boundaries’ present a challenge when delineating the responsibilities of different team members (Toscan et al., 2012).

There is also a lack of knowledge about integration. A key challenge is reaching consensus on a definition of what integrated care might look like and how it might be measured. Although in the AHP/musculoskeletal sense there has been emphasis on the importance of multidisciplinary teams for a number of years, the evidence base lacks sources which explicitly assess the effectiveness of integration in improving quality of care.

Negative attitudes

Evidence has suggested there is sometimes a lack of trust between health care providers (Westby and Backman, 2010). In some cases, this may stem from a sense of competition (Westman, 2010), with health professionals wanting to be leaders rather than team players; and in other cases, it may relate to groups not perceiving a need to work with other health practitioners. For example, AHPs involved in the EPC program (Middlebrook and Mackenzie, 2012) noted that many GPs did not seem to understand the importance of collaborating with AHPs. This is a particular challenge when the GP is seen as the gatekeeper in this type of program.

Sometimes resistance also occurs among patients. For example, Brand et al. (2010) found that patients frequently did not take up recommended conservative therapy. The main barriers were access (including timetabling) and patient preference.

Mechanisms that enable integration

Various mechanisms to improve integration of AHPs have been identified in the literature. In 2003, Services for Australian Rural and Remote Allied Health and the National Rural Faculty of the RACGP investigated strategies to improve the integration of AHPs and GPs in PHC settings in rural and remote areas, in order to improve their ‘financial and personal sustainability’, which could help to

address the shortage of AHPs in those areas (Lowe and Lawrance, 2005). Some of the mechanisms that have been identified in the literature include the following factors; others are described in more detail in the sections below:

- awareness raising (Lowe and Lawrance, 2005)
- inter-professional education (Craddock, 2010, Lineker et al., 2011)
- champions (Mior et al., 2010)
- improved communication (Marion and Balfe, 2011, Middlebrook and Mackenzie, 2012, Mior et al., 2010, Westby and Backman, 2010)
- co-location (Riva et al., 2010)
- on-site referral (Lowe and Lawrance, 2005)
- project or trial approach (Lowe and Lawrance, 2005)
- pooled funding (Lowe and Lawrance, 2005).

Local context

Integrated care is only possible in practice environments in which health professionals are willing, able and prepared to work with other health professionals. In this light, local context is important: sometimes inter-professional practice will be entrenched within an organisation's ethos (Lundon et al., 2013) such as in GP Super Clinics where AHPs and GPs work closely together; and at other times it is up to individuals to encourage collaboration. This reflects practice parameters (Mior et al., 2010) and relates to the resources available to a particular organisation or individual that will allow them to work closely with others. Collaboration and referrals within a local context can be positive and/or negative. Positive outcomes occur when practice is underpinned by a well-trained workforce providing an evidence-based approach; in contrast, referring to professionals with the same treatment bias or approach may not be beneficial for optimal patient care.

Infrastructure

AHP and GP networks

In Australia "clinical and health networks manifest predominantly as State-Government facilitated, multidisciplinary, advisory groupings of health professionals and consumers, with common professional interests in particular care or services" (Cunningham et al., 2012, p 110). Such networks may refer to clinical advisory groups, regional PHC networks in the form of Medicare Locals, and Local Health Networks (and their various state-specific manifestations).

Cunningham et al. (2012) investigated the achievements of two clinical networks specifically working in musculoskeletal health in Australia. Network members join voluntarily and span a range of disciplines including specialists, GPs, nurses, AHPs (no details were provided as to which professions), consumers, non-government organisations, researchers, policy analysts, health service managers, Medicare Locals, and health planners. Although both networks were established by their respective state governments, the NSW network was governed by a clinical agency, whereas the WA network was coordinated by the WA Department of Health. Cunningham et al. (2012) suggested that the former allowed for clinical engagement and independence, whereas the latter developed strategies and priorities closely aligned with the Government's focus.

The benefits of such networks included enhanced ability to identify gaps and areas of need and to develop best practice; breakdown of silos; improving professional/patient interaction; encouraging communication and networking across health providers; knowledge brokering with consumers and policy makers; and engaging a broad range of stakeholders. The key outcome of these networks was around engagement for research collaboration and/or multidisciplinary clinician engagement.

Community members also perceived that the networks had raised awareness of the needs of those with musculoskeletal conditions (Cunningham et al., 2012).

Incentives to AHP integration

Medicare items related to arthritis and other musculoskeletal conditions

Musculoskeletal conditions are recognised by Medicare as chronic medical conditions that may be eligible for chronic disease management services provided by AHPs (Department of Health, 2014). To be eligible for Medicare rebates, AHPs must meet specific eligibility requirements (primarily registration or accreditation), be in private practice, and be registered with Medicare Australia. In addition, services must be at least 20 minutes in duration and must be provided to individuals, not groups.

For patients who have chronic (or terminal) medical conditions and complex care needs, Medicare provides for a maximum of five individual services per year (MBS items 10950 to 10970) (Department of Health, 2014). These services may be provided by Aboriginal and Torres Strait Islander health practitioners, Aboriginal health workers, audiologists, chiropractors, diabetes educators, dietitians, exercise physiologists, mental health workers, OTs, osteopaths, physiotherapists, podiatrists, psychologists, and speech pathologists.

Indigenous patients may also be eligible for up to five follow-up allied health services for those who have had a health assessment (items 81300 to 81360) in addition to services for chronic (or terminal) medical conditions and complex care needs (Department of Health, 2014).

Patients with comorbid mental health disorders (e.g. depression), which are common among people with musculoskeletal disorders (AIHW, 2013b), may also be eligible for up to 10 mental health services, which can include Focussed Psychological Strategies in allied mental health services (Department of Health, 2014).

In July 2011, MBS items and financial incentives were introduced for videoconsultations across the full range of medical specialties. MBS rebates are also available for GPs, other medical practitioners, nurse practitioners, Aboriginal health workers and practice nurses to provide face-to-face clinical support to patients during videoconsultations with specialists. Currently AHPs (apart from Aboriginal health workers) are eligible for videoconsultation rebates only if they personally attend patients, meet specific eligibility criteria related to registration or accreditation, work in private practice, and are registered with Medicare Australia (Department of Health, 2014). However, rebates for doctors, nurse practitioners, Aboriginal health workers, and practice nurses could encourage them to participate in videoconsultations with AHPs. Although limited, evidence for the use of videoconsultations by AHPs has shown promise in relation to patient and provider satisfaction and cost-effectiveness (Raven and Bywood, 2013).

Enhanced Primary Care program

The EPC program was introduced in Australia in 1999. It supported older people and those with chronic conditions requiring multidisciplinary care to access AHP services in the community. It included Enhanced Primary Care Medicare Benefits Schedule (EPC MBS) items, and a General Practice Education, Support and Community Linkages Program to educate GPs, AHPs and the community about the EPC MBS items and promote their use (Wilkinson et al., 2003). Additional Medicare items for chronic diseases were added in 2004 (Menz, 2009).

Analysing Medicare data, Menz (2009) found that podiatry services had been extensively utilised via the EPC program, predominantly by women aged over 65, and had dramatically escalated between 2004 and 2008. Only physiotherapists provided more services during that period. Menz did not report how many of the people utilising podiatric services had musculoskeletal disorders, but cited his earlier research that found that service users were likely to have major chronic medical conditions such as osteoporosis, osteoarthritis, and diabetes (Menz et al., 2008).

Although the EPC program improved access to allied health services, there was some concern that the five Medicare-funded allied health sessions provided through the program were insufficient for patients with complex conditions, encouraged rapid use of inappropriate sessions to other patients, and that low rebates for services presented some challenges to best practice (Foster et al., 2009, Middlebrook and Mackenzie, 2012).

Participants reported that the restriction on the number of subsidised sessions was not conducive to providing a good allied health service to patients with complex care needs and remuneration was not commensurate with the nature and scope of treatment required. The AHP in this study spoke of the dilemma of wanting to assist patients but at the same time to operate a financially viable business (Foster et al., 2009, p 326).

Sims et al. (2004) found that AHPs in Victoria perceived GP attitudes and lack of engagement to be a key barrier to their use of the Medicare EPC items. Workshops run by the Divisions of General Practice had some benefits, but were poorly attended by GPs. Therefore, it is important that incentives are not only made available, but that they are sufficient to drive behavioural change, and routinely monitored (Oliver-Baxter et al., 2014).

Co-location

Often multidisciplinary teamwork can be enhanced by co-location of services (Jackson et al., 2008). For example, GP Super Clinics allow AHPs and GPs to occupy the same building, offering patients a 'one stop shop'. Riva et al. (2010) described the value of co-location in terms of allowing health professionals to interact in person with other health care providers, sharing their expertise and decision making. They describe how models of co-location specific to chiropractors allowed questions to be directed immediately to colleagues, which streamlined the experience for patients. Co-location also allows for in-person referrals and encourages more effective communication.

AHP and GP super clinics

In a recent evaluation of the GP Super Clinics program (Australian Government Department of Health and Ageing, 2012), there were no specific data on services relevant to arthritis and musculoskeletal conditions. However, there was information on the integration of AHPs in GP Super Clinics, more generally. One of the key criticisms was in the design of the physical structures, which was not always conducive to fostering integration:

Integration of disciplines within the buildings was uncommon, i.e. GPs tended to have a wing or section while other disciplines occupied other parts of the building. This was commonly perceived as a barrier to integration, especially by allied health and nursing staff (p 35).

A patient survey of GP Super Clinics indicated that approximately 27 per cent of patients saw an AHP in the previous 12 months (Australian Government Department of Health and Ageing, 2012).

However, from AHP and patient interviews, many AHPs were positive about the opportunities to discuss cases and access shared health records; and patients were happy to have the range of services in one location. Overall, the report suggested that GPs and AHPs are willing to work together in a multidisciplinary setting; and have “a high level of professional satisfaction working under this model” (p 72). This may reflect the financial and business incentive nature of this approach, or the better care and optimal patient outcomes that can be achieved; and disentangling the separate influences of these factors requires further exploration.

Champions

In a qualitative study exploring inter-professional collaboration between physicians and chiropractors in Canadian community-based primary care (Mior et al., 2010), the sustainability of collaborative relationships reflected the effectiveness of leaders (i.e. leaders as enablers who ensured necessary resources and incentives were available) and champions (i.e. individuals who facilitated and coordinated day-to-day activities).

Inter-professional education

Inter-professional education has been acknowledged as an important requisite in fostering collaboration, potentially providing consistency and improving care for patients who require support from multidisciplinary teams (Chehade et al., 2011). The evidence base in relation to chronic disease management is not very strong, but this may be because of difficulties in conducting interdisciplinary research (Ross and Harris, 2005).

The need for interdisciplinary clinical practice guidelines for musculoskeletal health has been frequently emphasised (Mior et al., 2010). In this light, the Australian Musculoskeletal Education Collaboration (AMSEC) Project, established in 2005, involved the development of a model for collaborative, inter-professional and interdisciplinary evidence-based competency education in health. It stemmed from an understanding that support for musculoskeletal conditions is required from a range of health professionals who currently have their own curricula, teaching resources and guidelines, despite the fact that they are working with the same patients and with shared goals. AMSEC’s aim is “to improve health-related outcomes for Australians with musculoskeletal conditions by raising the quality of healthcare through defining core musculoskeletal competencies for Australian medical schools” (Chehade et al., 2011, p 219). The health education framework and musculoskeletal competency areas put forward by the project provide an educational reference which highlights the knowledge, skills and attitudes that are common between disciplines; hence it can be applied across medical and allied health training. As health professionals learn more about each other’s roles and capacity and develop a common language, preparedness to work together and apply complementary skills is likely to increase.

In Canada, Lineker, Bell and Badley (2011) described a national, inter-professional, community-based continuing health education intervention (i.e. the Getting a Grip on Arthritis program) which aimed to improve the management of rheumatoid arthritis and osteoarthritis. Over 500 participants (primary care providers including nurses, rehabilitation professionals, physicians, nurse practitioners, other healthcare providers, non-clinical staff and students) attended one of 27 workshops held across Canada. The workshops were run by local multidisciplinary arthritis specialists from diverse fields including rheumatologists, dietitians, physiotherapists, OTs, social workers and pharmacists. The workshop addressed behaviour change, providing opportunities for skill development, team learning, networking, goal setting, and modelling; and six months of follow-up activities to reinforce learning (e.g. provision of resources, follow-up of goals established at the workshop).

In its pilot stage, evaluations of the program, delivered in community health settings, illustrated improvements on all of provider confidence and satisfaction in managing arthritis, patient education and rates of referral to rehabilitation specialists. After national roll-out to primary care settings, the program illustrated modest improvements in health professionals' adherence to recommendations for arthritis best practices in the 12 months following the workshop. In particular, there were increases in the proportion of providers recommending referrals to rheumatology, more appropriate medication prescriptions, and improved nutritional recommendations; nurse practitioners and rehabilitation therapists illustrated the greatest improvements.

Respectful relationships

Relationships are the cornerstone of integrated care and must exist between and within health professions from across the health system (Briggs et al., 2012), not only between GPs and AHPs but also between PHC and hospitals, and also must include exchanges with patients. In a Canadian study on inter-professional collaboration in community-based primary care with a focus on chiropractors and GPs, one health practitioner participant emphasised that "the patient is really the most potent integrator of health care" (Mior et al., 2010, p 682). In relationships with patients and any members of a multidisciplinary team, there needs to be trust and respect. It has been said that "a well-functioning team is characterized by respect for the competences of other health care professionals and by the realization that no one has a preferential right of interpretation" (Westman, 2010, p 24). It is necessary to have clear boundaries (Harding et al., 2010); particularly in the musculoskeletal realm, where each practitioner's specific background will inform their specific treatment approach. Although teamwork is of great benefit, each member of the team has their own set of skills.

Communication

Communication is consistently highlighted as the key to effective collaboration both across settings and across the continuum of care (Marion and Balfe, 2011, Middlebrook and Mackenzie, 2012, Mior et al., 2010, Westby and Backman, 2010). In a qualitative study focusing on rehabilitative practice following total hip and knee arthroplasty for osteoarthritis, patients and practitioners noted that poor communication was linked to decreases in efficiency, effectiveness, collaboration, and coordination of services. This study suggested that team care, defined as "centralized information, a communication form that stays with the patient, better links between facilities and providers, and practice guidelines" (Westby and Backman, 2010, p 124), may be able to encourage effective communication. Similarly, Toscan et al. (2012) described the importance of complete and prompt transfer of information between the parties involved in a patient's care. They emphasised that shared agreements must be in place to prevent the situation in which one health provider records patient notes as they go and is left waiting by other providers who prefer to complete a set at a time. This is particularly important in the musculoskeletal setting when patients will be seen not only by GPs and AHPs in the PHC sector, but also by specialists in the tertiary sector.

Regular team meetings are an important communication tool that enable health professionals to understand what is happening for the patient and get an opportunity to contribute equally to discussion around the support being provided (Harding et al., 2010, Mior et al., 2010, Polus et al., 2012). These meetings reflect a case management or case conferencing approach and offer a beneficial way for health professionals to develop a better understanding not only of their patients' circumstances but also of their colleagues' scope of practice (Riva et al., 2010). However, it is also important that there is a culture that accepts this style of practice and has the available infrastructure to accommodate it (Marion and Balfe, 2011), such as the GP Super Clinic environment. Although case management supports a multidisciplinary team model, there is often a designated individual who coordinates the care. This is particularly beneficial as many patients have reported

that they want to see the same health professional for management of their chronic disease in order to achieve continuity of care (Dziedzic et al., 2009). In fact, this was a common component in many of the models presented in this report; a care coordinator often enacted a type of ‘triage’ role in which patients were referred to a service, assessed by the coordinator, and then referred on to appropriate multidisciplinary services.

Summary and conclusions

Musculoskeletal conditions require support across the continuum of care, often for long periods of time. AHPs play a key role in their management, along with GPs, specialists, and nurses. Although it is widely recommended that AHPs be involved in multidisciplinary teams, there is evidence that this often does not occur to an adequate extent (Brand et al., 2011). There are some promising models and strategies to improve allied health integration in collaborative care, but as yet few have been evaluated rigorously. Consequently there is little evidence of effectiveness and cost-effectiveness of AHPs' integration into musculoskeletal care teams.

There is much debate about definitions of, and differences between, integration and collaboration. Although integration is the aim of the *National Primary Health Care Strategy*, it seems that current practice for GPs and AHPs supporting patients with musculoskeletal conditions more accurately reflects collaboration. Multidisciplinary teams are common and are a positive step towards provision of holistic care; but for full integration, changes need to occur not only at this practitioner (micro) level but also at higher organisational (meso) and policy (macro) levels (Oliver-Baxter et al., 2013a). Although collaboration is frequent among health professionals supporting patients with musculoskeletal conditions, the literature suggests that the focus has been on cross-sectoral collaboration or vertical integration, with interventions involving tertiary level practitioners such as rheumatologists and orthopaedic specialists, rather than integrating within the PHC sector. There needs to be a greater focus on connecting the health professionals working within the PHC sector to support patients with musculoskeletal conditions in the future.

The evidence sourced for this review illustrated some benefits of collaborative musculoskeletal care. These included the ability for AHPs to address non-medical, non-surgical needs of patients and target the multifaceted nature of their conditions. Apart from pharmacists, who are involved primarily in a dispensary role, it is most often physiotherapists and OTs who are involved in multidisciplinary care for musculoskeletal conditions. Several models of integration between general practice and AHPs for the management of musculoskeletal disorders include physiotherapists and occupational therapists in prominent roles.

There are some examples of effective Australian and international models, particularly in relation to arthritis. Australian examples include the *Osteoarthritis Chronic Care Program* in New South Wales, which is based on musculoskeletal coordinators and multidisciplinary teams working closely with general practitioners (GPs), and the *Western Australian Inflammatory Arthritis Model of Care*, which enacts guidelines that emphasise multidisciplinary teamwork and inter-professional education. In Canada, *The Arthritis Program* is a longstanding model that incorporates a range of health professionals with a focus on shared visions, values and resources (i.e. 'one patient, one chart') and empowering patients for self-management. An additional model from Canada which emphasises training for extended roles, the *Advanced Clinician Practitioner in Arthritis Care program*, has also demonstrated benefits. However, there is evidence that multidisciplinary, multifactorial models are not always cost-effective when compared with usual care. Furthermore, where there are overall benefits as a result of multifaceted models, it is difficult to differentiate among the model's components to ascertain which ones are critical to success.

Many of the models presented throughout this report highlight the benefits of multidisciplinary teams working together to offer multifaceted support to patients. Although there is evidence of positive benefits for patients, little is known about the extent to which the process of integrating health professionals impacts on patient outcomes. It is difficult to verify whether it is the process of

integrating health professionals that is of benefit or if it is that the different practitioners have skill sets that enable them to handle different aspects of an individual's care. Future research needs to consider ways to disentangle the influence of separate components of multidisciplinary, multifaceted interventions.

A range of barriers to AHP integration have been identified. These include:

- complexity of systems and financing arrangements
- staffing/workforce challenges
- access to technology
- limited rewards/incentives for integrating with other health professionals
- lack of role recognition or understanding of different professionals' skills
- negative attitudes
- conflicting organisational culture and historical experiences
- insufficient evidence.

Potential solutions include:

- conducting research to explore the specific nature of multidisciplinary teams and the benefits of AHP involvement in collaborative care
- raising awareness in terms of different health professionals' skills and the benefits of collaborative care through mechanisms such as inter-professional education
- developing infrastructure arrangements to enable shared resources and co-located teams
- cultivating trusting and respectful relationships with effective communication processes
- providing financial incentives for collaboration
- attending to the messages of champions and leaders
- providing inter-professional education
- considering case coordination approaches for continuity of care.

Policy considerations for AHP integration in musculoskeletal care need to address AHP involvement, outcomes and evidence. More specific detail and evidence is required about both the AHPs participating in multidisciplinary teams and the benefits of such arrangements; and greater consistency is needed in policy and practice use of terms such as integration and collaboration. Further development and dissemination of multidisciplinary guidelines for musculoskeletal care which take into account the contributions of different healthcare practitioners may encourage more collaboration and shared visions across parties involved in care. Furthermore, models such as GP Super Clinics offer potential for integrated practices and are well-placed for future investigation of how co-location of GPs and AHPs can affect patient care. Similarly, as the electronic health system continues to be rolled out across Australia, such technologies may provide opportunities for shared resources and more efficient communication processes.

Complex problems require complex solutions. Traditional approaches that address individual risk factors are insufficient as musculoskeletal conditions are complex and multi-causal; client needs are multidimensional, and knowledge and resources to address the problems are located across multiple sectors. Therefore, addressing these conditions will require complex solutions, i.e. inter-professional, interdisciplinary, cross-sectoral teams offering coordinated multifaceted interventions.

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Appendices

Appendix 1 Roles and services provided by allied health professionals

1 Physiotherapists

Physiotherapists assess and treat a wide range of physical disorders. They are key providers of rehabilitation after health crises such as traumatic injuries and strokes. They also assess and manage age-related disabilities, and childhood and lifespan disabilities caused by disorders such as cerebral palsy or spina bifida. They often focus on walking and hand/arm function. Physiotherapists' roles overlap with occupational therapists' roles, particularly in relation to independent living activities. In the US, physiotherapists are referred to as 'physical therapists' (American Physical Therapy Association, 2012). In Australia, to be eligible for Medicare rebates, physiotherapists must be registered with the Physiotherapy Board of Australia (Department of Health, 2014).

Physiotherapists have a crucial role in the management of musculoskeletal disorders. According to the AIHW (2013c, p 11):

Physiotherapists may provide advice to assist patient understanding of the disease and their role in self-management. They may also develop exercises customised to individual needs to maintain strength and physical functioning.

Musculoskeletal disorders dominate the work of physiotherapists. The AIHW (2013a, p 47) reported that “Most physiotherapists were involved in musculoskeletal (10 131), followed by aged care (2 678)”. Needle et al.'s (2011) systematic review of UK health promotion studies (2000-2008) found that 14 per cent of conditions targeted by physiotherapists were arthritis/rheumatic disorders. Other related treatment was for back and neck pain (28%), chronic pain, fibromyalgia and chronic fatigue syndrome (10%).

2 Occupational therapists

Occupational therapists (OTs) assist people to participate in the activities of everyday life (Occupational Therapy Australia, 2013). They have a major focus on independent living activities such as toileting and feeding. OTs' roles overlap significantly with physiotherapists' roles. To be eligible for Medicare rebates, an OT must be registered with the Occupational Therapy Board of Australia (Department of Health, 2014).

OTs play a major role in the management of musculoskeletal disorders. They can provide many of the services that physiotherapists provide, including home-based assessments. According to the AIHW (2013c, p 11):

Occupational therapists may provide splints (a medical device to immobilise limbs or the spine) for supporting joints and other aids to help people with everyday activities such as getting dressed or writing.

Needle et al.'s (2011) systematic review of UK health promotion studies (2000-2008) found that the main conditions targeted by OTs were “mental health (32%), arthritis (21%) and pain and fatigue (18%)” (p 14).

3 Podiatrists/chiropractors

Podiatrists (also referred to as chiropodists) deal with “the prevention, diagnosis, treatment and rehabilitation of medical and surgical conditions of the feet and lower limbs” (Australasian Podiatry Council, 2009). Podiatrists treat a wide range of disorders, including: bone and joint disorders (e.g. arthritis), soft tissue and muscular disorders, neurological disorders, and circulatory disorders. To be eligible for Medicare rebates, a podiatrist must be registered with the Podiatry Board of Australia (Department of Health, 2014).

Podiatrists have a substantial role in the management of musculoskeletal disorders (Denby, 2009), primarily in maintaining the health of feet and assessing and treating foot problems, thereby fostering mobility and helping to maintain general health. According to the AIHW (2013c, p 11):

Podiatrists may be able to help people whose feet and ankles have been affected by rheumatoid arthritis. Podiatrists may also introduce orthotics (custom-made inserts that fit inside the shoe to reduce foot pain and better align the foot) to help people with rheumatoid arthritis walk without pain or with reduced pain.

In a South Australian study, Menz et al. (2008) found that podiatry service users were likely to have major chronic medical conditions such as osteoporosis, osteoarthritis, and diabetes. Menz (2009) found that podiatry services had been extensively utilised via the EPC program.

In New Zealand, Rome et al. (2010) highlighted problems related to foot-care for patients with arthritis. Referring to podiatry as a ‘Cinderella’ service, they argued for the integration of podiatrists into multidisciplinary teams: “what is needed is an integrated approach to the management of foot problems with podiatrists being the key practitioner in co-ordinating assessment and management of the foot and its related problems” (p 94). They noted that foot-care was provided by a range of health professionals, including specialist doctors, GPs, nurses, orthotists, physiotherapists, and OTs, but that overall there was a lack of consistency and integration with rheumatology services.

Rome et al., (2010) emphasised the need for inter-professional education, clear guidelines, protocols, and referral pathways at local levels. These should include:

- clearly specified geographic eligibility and agencies able to refer
- agreed criteria for self-management, eligibility for referral from both primary and secondary care, and self-referral
- signs and symptoms indicating a need for referral
- red flag signs and symptoms indicating a need for priority referral (e.g. early onset joint pain and synovitis, restricted mobility, infection).

4 Chiropractors

Chiropractors are complementary and alternative medicine practitioners who specialise in “the diagnosis, treatment and prevention of disorders of the neuromusculoskeletal system and the effects of these disorders on general health” (WHO, 2005, p 3). Chiropractors' roles overlap significantly with osteopaths' roles. To be eligible for Medicare rebates, a chiropractor must be registered with the Chiropractic Board of Australia (Department of Health, 2014).

Chiropractors have a role in the management of musculoskeletal disorders, primarily in relation to spinal problems. However, referral rates to chiropractors are often low, and there is sometimes resistance to such referrals. For example, Louw (2005) reported that the general perception in South Africa was that GPs tended not to refer patients to chiropractors.

Garner et al. (2008) reported on the successful introduction of a chiropractor as a part-time staff member in each of two community health centres in Ottawa. Staff attitudes towards collaboration with the chiropractor improved over time, as did attitudes about the effectiveness of chiropractic care. Garner et al. (2008) noted that it was important to structure and schedule interactions between the chiropractor and the existing staff, for example by including the chiropractor in weekly team meetings. They also found that inter-professional education was important, for example, presentation of peer-reviewed research on chiropractic care.

5 Osteopaths

In Australia (and additional countries other than the US), osteopaths are complementary and alternative medicine practitioners who are trained to provide manipulative therapy for musculoskeletal conditions (American Association of Colleges of Osteopathic Medicine, 2012). They are not licensed to prescribe drugs or undertake surgery. Osteopaths' roles overlap significantly with chiropractors' roles. To be eligible for Medicare rebates, an osteopath must be registered with the Osteopathy Board of Australia (Department of Health, 2014).

Osteopaths have a role in the management of musculoskeletal disorders, primarily by providing spinal manipulation for low back pain (Licciardone et al., 2005).

6 Dietitians

Dietitians (dieticians) provide health care services related to diet, nutrition, and weight, for people with or without diagnosed disorders. They provide specialised care for people with a range of diseases, particularly diabetes, cardiovascular disease, and other chronic and potentially serious diseases. To be eligible for Medicare rebates, a dietitian must be an 'Accredited Practising Dietitian' as recognised by the Dietitians Association of Australia (DAA) (Department of Health, 2014).

Dietitians have a role in the management of musculoskeletal disorders, primarily in terms of weight control, which affects joint function and mobility. Many people hospitalised with osteoporotic fractures access dietitians (AIHW, 2010b). However, throughout searches for this report, equivalent information related to PHC settings was unable to be located.

7 Pharmacists

Pharmacists are trained and licensed to dispense prescribed drugs. They also supply over-the-counter medications and other health-related goods. Many pharmacists work in private retail settings.

Pharmacists have a role in the management of musculoskeletal disorders, primarily in a dispensary role, providing medications (both prescribed and over-the-counter), and their services are used by most people with musculoskeletal disorders. According to the AIHW (2013c, p 11):

Pharmacists may dispense medications for symptoms of rheumatoid arthritis. They may be able to provide information about how to take medications, possible side effects, and how these might be managed.

Because of the potentially debilitating and even life-threatening effects of fractures, many osteoporosis interventions focus on ensuring that people with osteoporosis are prescribed drugs; increasing their adherence in taking those drugs; and also taking calcium regularly. Another focus is on screening for risk factors and encouraging bone mineral density (BMD) testing of people identified as being at risk.

8 Psychologists

In the health sector, psychologists have a primary focus on mental health problems, but they also participate in the management of physical conditions such as diabetes, obesity, and cardiovascular disease. To be eligible for Medicare rebates, a psychologist must hold General Registration with the Psychology Board of Australia (Department of Health, 2014).

Psychologists have a role in the management of musculoskeletal disorders. This includes pain management, anxiety/depression treatment, coping strategies and cognitive behaviour therapy to promote lifestyle changes (e.g. weight loss). According to the AIHW (2013c, p 11):

Psychologists may be involved in assessment, diagnosis and treatment of psychological issues including the negative emotional impact of having the condition. They may also assist with techniques to manage pain.

9 Social workers

Social workers assist people with welfare issues such as housing and assistance with daily living. They can also provide counselling. To be eligible for Medicare rebates, a social worker must be “a 'Member' of the Australian Association of Social Workers (AASW) and be certified by AASW as meeting the standards for mental health set out in the document published by AASW titled 'Practice Standards for Mental Health Social Workers' as in force on 8 November 2008” (Department of Health, 2014, p 15).

Social workers have a role in the management of musculoskeletal disorders, for example in organising and referral for in-home support and modifications, employment and vocational assistance, and disability pensions and other welfare benefits. According to the AIHW (2013c, p 11):

Social workers can help find community resources and government assistance to help affected individuals and family members cope with rheumatoid arthritis, such as patient support groups, financial assistance or respite care (Arthritis New South Wales 2013).

Social workers feature in some of the models presented throughout this report, including the Inflammatory Arthritis Model of Care (Department of Health (Western Australia), 2009). However, although many people hospitalised with osteoporotic fractures access social workers (AIHW, 2010b), it was not possible to locate similar data for PHC settings during searches for this review.

Appendix 2 Search terms

Table 6 Search terms

Integration terms	collaboration collaborative integration integrated collaboration collaborative multidisciplinary multiprofessional interprofessional interdisciplinary
AHP terms	"allied health" audiologist chiropodist chiropractor dietitian "exercise physiologist" "exercise therapist" "music therapist" "occupational therapist" orthoptist orthotist osteopath pharmacist physiotherapist "physical therapist" podiatrist prosthetist psychologist "social worker" "speech pathologist" "speech therapist"
Other terms	chronic disease

Appendix 3 Examples of musculoskeletal care guidelines

Guidelines that recommend collaborative multidisciplinary approaches to management of musculoskeletal conditions include the following:

Royal Australian College of General Practitioners (RACGP) Guidelines

The RACGP (2009) *Clinical guideline for the diagnosis and management of early rheumatoid arthritis* recommends multidisciplinary teamwork:

Recommendation 5 (Grade B)

General practitioners should encourage and support a management approach that is based on individual patient need and involvement of a multidisciplinary team of health professionals (p 19).

British Society for Rheumatology Standards of Care

The importance of multidisciplinary teams is also emphasised in the British Society for Rheumatology's standards of care for persons with rheumatoid arthritis (Kennedy et al. 2005):

Standard 3: The multidisciplinary team

All persons with rheumatoid arthritis should have access to the multidisciplinary rheumatology team. This team should include:

- general practitioner
- consultant rheumatologist
- consultant orthopaedic surgeon
- doctors in training (hospital and general practitioner)
- nurse specialist
- physiotherapist
- occupational therapist
- dietician
- podiatrist
- orthotist
- pharmacist
- social worker.

Access to voluntary organizations involved in rheumatoid arthritis management, counselling services, the pain management team, neurosurgery, plastic surgery, neurophysiology and the wheelchair service should also be available. When clinically indicated, access to a member of the multidisciplinary team should be available within 6 weeks of referral (p 544).

NICE guidelines

The UK National Institute for Health and Care Excellence (NICE; previously the National Institute for Health and Clinical Excellence) has multiple lengthy guidelines for musculoskeletal disorders, including:

- Rheumatoid arthritis: National clinical guideline for management and treatment in adults (National Collaborating Centre for Chronic Conditions, 2009)
- Osteoarthritis: Care and management in adults (National Institute for Health and Care Excellence, 2014)

These emphasise the need for multidisciplinary management. For example, the NCCC (2009) algorithm specifies:

Multidisciplinary team

People should have ongoing access to a multidisciplinary team. This should provide the opportunity both for:

- periodic assessments of the effect of the disease on their lives
- help to manage the condition.

People should have access to a named member of the multidisciplinary team (e.g. the specialist nurse) who is responsible for coordinating their care.

People should have access to specialist physiotherapy, with periodic review.

People should have access to specialist occupational therapy, with periodic review, if they have:

- difficulties with any of their everyday activities
- problems with hand function.

Offer psychological interventions to help people adjust to living with their condition.

People should have access to a podiatrist for assessment and periodic review of their foot health needs.

Functional insoles and therapeutic footwear should be made available where indicated. (p 18)

Appendix 4 Models of integrated care

Table 7 Models of integrated care for musculoskeletal conditions

Model	Condition(s)	Location/ settings Period of operation	Health professionals	Details	Key mechanisms	Evaluated (quality)	Evidence
Inflammatory Arthritis Model of Care (Briggs et al., 2012, Department of Health (Western Australia), 2009)	Inflammatory arthritis	Western Australia 2009-	<ul style="list-style-type: none"> • Physiotherapists • Nurse specialists • Social workers • Extended scope physiotherapists • OTs • Pharmacists 	Model of care developed	<ul style="list-style-type: none"> • Identification of essential disease-specific knowledge and clinical skills required by community-based physiotherapists • Learning modules for physiotherapists in clinical service delivery • Learning modules for all health professionals in delivery of self-management programs • Online resources for the effective self-management of musculoskeletal pain 	Not formally evaluated	

Model	Condition(s)	Location/ settings Period of operation	Health professionals	Details	Key mechanisms	Evaluated (quality)	Evidence
Rheuma Rehab (Hagel et al., 2010)	Chronic inflammatory arthritis	Sweden 2002-	<ul style="list-style-type: none"> • Physiotherapist • OT • Social worker • Nurse • Rheumatologist 	<ul style="list-style-type: none"> • Intervention ran for 18 days involving full-time day-care rehabilitation • Series of daily exercise and complementary and alternative medicine sessions • Physiotherapist provided one-on-one contact for 1-1.5 hours each week, 2 hours with OT and 45 minutes of education from each team member 	<ul style="list-style-type: none"> • Inter-professional education • Shared vision 	Good quality evaluation conducted	<ul style="list-style-type: none"> • Improved aerobic capacity and health-related quality of life • Positive results consistent for both groups of patients (peripheral arthritis and spondylarthropathies) • Results maintained for at least one year following intervention

Model	Condition(s)	Location/ settings Period of operation	Health professionals	Details	Key mechanisms	Evaluated (quality)	Evidence
The Arthritis Program (TAP) (Bain et al., 2012)	Arthritis	Canada Newmarket Ontario 1991-	<ul style="list-style-type: none"> • Clinical and medical coordinators • OTs • Physiotherapists • Pharmacists • Social workers • Dieticians • Kinesiologists • Rheumatologists • Volunteers • Administrators 	<ul style="list-style-type: none"> • Referrals from physicians, rheumatologists or surgeons • Patients undergo detailed initial history assessment administered by a team member, decision is made as to whether they require rheumatologist consultation and formalised education and comprehensive care programs offered to improve self-management • Based on self-efficacy framework of empowering patients • Systematic set of outcome measures to monitor patients and their achievement of milestones • Follow up contact face-to-face or email 	<ul style="list-style-type: none"> • Patient-centred • Shared records • Self-management • Uses skills of specific professionals • Shared decision making • Trust • Shared vision 	High quality evaluation conducted	<ul style="list-style-type: none"> • TAP supports over 10 000 outpatient visits per year, potentially reducing costs to hospitals that would be incurred with inpatient treatment • Reduced waiting times for patients who receive an assessment within two weeks and a rheumatologist consultation within four weeks • Improvements in patients' perceived self-efficacy to manage their condition, cope with pain and maintain functioning • Positive outcomes on standardised disease and activity measures

Model	Condition(s)	Location/ settings Period of operation	Health professionals	Details	Key mechanisms	Evaluated (quality)	Evidence
Osteoarthritis Chronic Care Program (OACCP) (Agency for Clinical Innovation, 2012b, Agency for Clinical Innovation, 2012c, Agency for Clinical Innovation, 2014)	Osteoarthritis	Australia NSW 2012- (pilot 2011)	<ul style="list-style-type: none"> • Physiotherapists • OTs • Dietitians • Psychologists • Pharmacists • GPs • Nurses • Specialists • Social workers • Exercise physiologists • Podiatrists 	<ul style="list-style-type: none"> • Program aims to reduce pain and improve function and quality of life among individuals who have chosen conservative management or are awaiting elective joint replacement surgery • Musculoskeletal coordinator (physiotherapist with extensive experience in managing musculoskeletal disorders) includes appropriate healthcare providers in multidisciplinary team • Musculoskeletal coordinator engages and maintains relationships with stakeholders and creates facility-based service • Targets nutrition, physical activity, exercise education and support 	<ul style="list-style-type: none"> • Face-to-face access to health professionals • Self-management • Care coordinator • Cross-sectoral relationships • Shared action plan 	Integral evaluation with annual reporting (2 years) and quarterly reports	<ul style="list-style-type: none"> • Of 1 228 patients referred to program in first 12 months, 885 were assessed • Most assessed patients commenced care plan within 120 days • 10% of knee patients and 4.5% of hip patients removed from surgical waitlist (January 2011 to September 2012) • Patients showed improvements on tests of balance and functional mobility • >80% of patients achieved weight reduction or stabilisation within first six months • 90% of patients 'satisfied' or 'very satisfied' with the program

Model	Condition(s)	Location/ settings Period of operation	Health professionals	Details	Key mechanisms	Evaluated (quality)	Evidence
Osteoporotic Refracture Prevention (ORP) (Agency for Clinical Innovation, 2011, Agency for Clinical Innovation, 2012a)	Osteoporosis	Australia NSW	<ul style="list-style-type: none"> • Fracture Liaison Coordinators • Multi-disciplinary team members (AHPs, nurses) 	<ul style="list-style-type: none"> • Program aims to improve care of people aged 50+ who have suffered a minimal/low trauma fracture, to reduce risk of subsequent fractures 	<ul style="list-style-type: none"> • Case management • Education • Support for self-management • bone mineral density scanning • vitamin D deficiency testing • medication prescribing 	Integral evaluation with quarterly reporting	<ul style="list-style-type: none"> • modelling suggests potential savings of 238,449 bed-days and \$226.6 million savings over 10 years (statewide NSW)

Model	Condition(s)	Location/ settings Period of operation	Health professionals	Details	Key mechanisms	Evaluated (quality)	Evidence
Integrated care program (Esseleens et al., 2009)	Early rheumatoid arthritis	Belgium 2005-	<ul style="list-style-type: none"> • Rheumatology nurse specialist • Physiotherapists • OTs • Social workers 	<ul style="list-style-type: none"> • Care coordinated by rheumatology nurse specialist who evaluated patients at outpatient clinic • Nurse decided whether to involve additional team members • Nurse organised reviews of cases in weekly team meetings 	<ul style="list-style-type: none"> • Case management 	High quality evaluation conducted	<ul style="list-style-type: none"> • Evaluation compared standard rheumatologist-centred care with a multidisciplinary outpatient program • Intervention group recorded higher rates of remission, less disease activity and better functionality and general health • Intervention group reported higher levels of satisfaction on quantity and quality of received information, organisation of care and treatment effectiveness • Coping style and illness perceptions were comparable across groups • Participation in the intervention predicted remission and absence of disability

Model	Condition(s)	Location/ settings Period of operation	Health professionals	Details	Key mechanisms	Evaluated (quality)	Evidence
Rheumatology multidisciplinary team education days (Ellard et al., 2009)	Rheumatoid arthritis	UK Worcestershire Royal Hospital 2005-	<ul style="list-style-type: none"> • Doctors • Nurses • Physiotherapists • Pharmacists • Dietitians • Reflexologists • Health psychologists • OTs 	<ul style="list-style-type: none"> • Education days included presentations, workshop sessions, and exhibitor booths • Workshop topics requested by patient group 	<ul style="list-style-type: none"> • Self-management • Shared decision making • Respect for roles 	Evaluation conducted	<ul style="list-style-type: none"> • Patient/carer feedback noted how wonderful it was to see health professionals working together • Positive health professional feedback centred around effect on collaboration, morale and a sense of team building • Education days were well received with participants citing increased access to information, and positive changes in arthritis management, self-efficacy and understanding of team members' roles

Model	Condition(s)	Location/ settings Period of operation	Health professionals	Details	Key mechanisms	Evaluated (quality)	Evidence
Newcastle West Musculoskeletal Pilot Pathway (Wilkes, 2013)	Musculoskeletal conditions generally	UK Newcastle West 2011-	<ul style="list-style-type: none"> • GPs • Physiotherapists • Orthopaedic consultants • Sport & exercise medicine consultants 	<ul style="list-style-type: none"> • Clinical Assessment and Treatment Services (CATS)³ • GPs referred patients to community service • Pathway administered from single-referral management centre • New physiotherapy service (incl. telephone assessment and advice), at GP practices • Orthopaedic and sport & exercise medicine consultants included in community service 	<ul style="list-style-type: none"> • Case management • Co-location • Building trust 	Good quality evaluation conducted	<ul style="list-style-type: none"> • Pilot service provided 62% more episodes of care • Specialists in community setting • Care moved into community – 40% reduction in GP orthopaedic outpatient attendance; and 44% in neurosurgical attendances • Increase in community consultations, particularly physiotherapy consultations • Waiting times significantly reduced (< 48 hours for physiotherapy phone consultation, 6 days to see physiotherapist) • 96% of patients rated care as “excellent” or “very good” on satisfaction measures • 97% of GPs rated the service as “much better” or “better” than prior to the intervention • Savings of £42,000 in a six month period - care costs during vs before the intervention • Savings of 41% for each average episode of care

³ based on Department of Health (2006) Musculoskeletal Services Framework

Model	Condition(s)	Location/ settings Period of operation	Health professionals	Details	Key mechanisms	Evaluated (quality)	Evidence
Comprehensive Combat and Complex Casualty Care Center (Goldberg et al., 2009)	Musculoskeletal rehabilitation	USA San Diego, CA 2007-	<ul style="list-style-type: none"> • PHC physicians • Physiotherapists • OTs • Vestibular therapists • Gait analysts • Prosthetics technicians • Recreational therapists • Chiropractors 	<ul style="list-style-type: none"> • Interdisciplinary approach to service provision (18 health professionals from 10 disciplines) • Patients assessed by primary care provider with pharmacist available for medication reviews • Patients provided with access to inpatient and outpatient consultations 	<ul style="list-style-type: none"> • Communication with patients and across team members • Case management • Co-location of services • Electronic health records 	Not formally evaluated	In first two years of operation, program supported approximately 500 patients

Model	Condition(s)	Location/ settings Period of operation	Health professionals	Details	Key mechanisms	Evaluated (quality)	Evidence
Study of the Effectiveness of a Collaborative Approach to Pain (SEACAP) (Dobscha et al., 2009)	Chronic pain	USA Portland, Oregon 2006-	<ul style="list-style-type: none"> • Nurses • Physicians • Psychologist care manager • Physiotherapist • Internist 	<ul style="list-style-type: none"> • Physicians participated in training workshops on pain, shared decision making and communication led by internist and psychologist • Patients assessed by care manager to identify fear-avoidance beliefs, treatment barriers, comorbid psychiatric disorders and functional goals • Care manager and internist developed recommendations sent to patients' clinicians • Patients attended four session workshop led by care manager and internist or physiotherapist, received educational materials and list of community resources • Patients followed up by care manager every two months 	<ul style="list-style-type: none"> • Case management • Post-program support 	Quality randomised controlled trial conducted	<ul style="list-style-type: none"> • Significant improvements in pain disability and intensity • Significant improvements in depression severity for those patients with depression • More guideline-concordant care provided • No great improvements on measures of pain treatment effectiveness, satisfaction with treatment and health-related quality of life

Model	Condition(s)	Location/ settings Period of operation	Health professionals	Details	Key mechanisms	Evaluated (quality)	Evidence
Interdisciplinary rehabilitation program (Gregg et al., 2011)	Back pain	NZ 8 private practice PHC clinics nationally 2001-	<ul style="list-style-type: none"> • Physiotherapists • OTs • Exercise therapists • Psychologists 	<ul style="list-style-type: none"> • Based on program developed by network of rehabilitation clinics known as Canadian Back Institute • Patients classified according to diagnosis • Patients provided with structured physiotherapy assessment, spinal physical examination and additional screening • Education and active exercise provided for patients to control symptoms, improve activity and address psychosocial barriers to recovery • Patients attend 1 hour clinic appointment for 3 sessions a week over 6-12 week period • Used customised software program which monitors and records symptoms and functional capacity 	<ul style="list-style-type: none"> • Self-management • Shared records 	Evaluation conducted Poor quality: no comparison group, completers only, but high response rate – 899/1 076 (84%) patients	<ul style="list-style-type: none"> • Audit of 899 patients who completed rehabilitation program over three years found that 86.8% reported that their back pain had gone or decreased • Significant improvement in both average pain and subjective functional scores from baseline to discharge and follow-up

Appendix 5 Musculoskeletal Services Framework

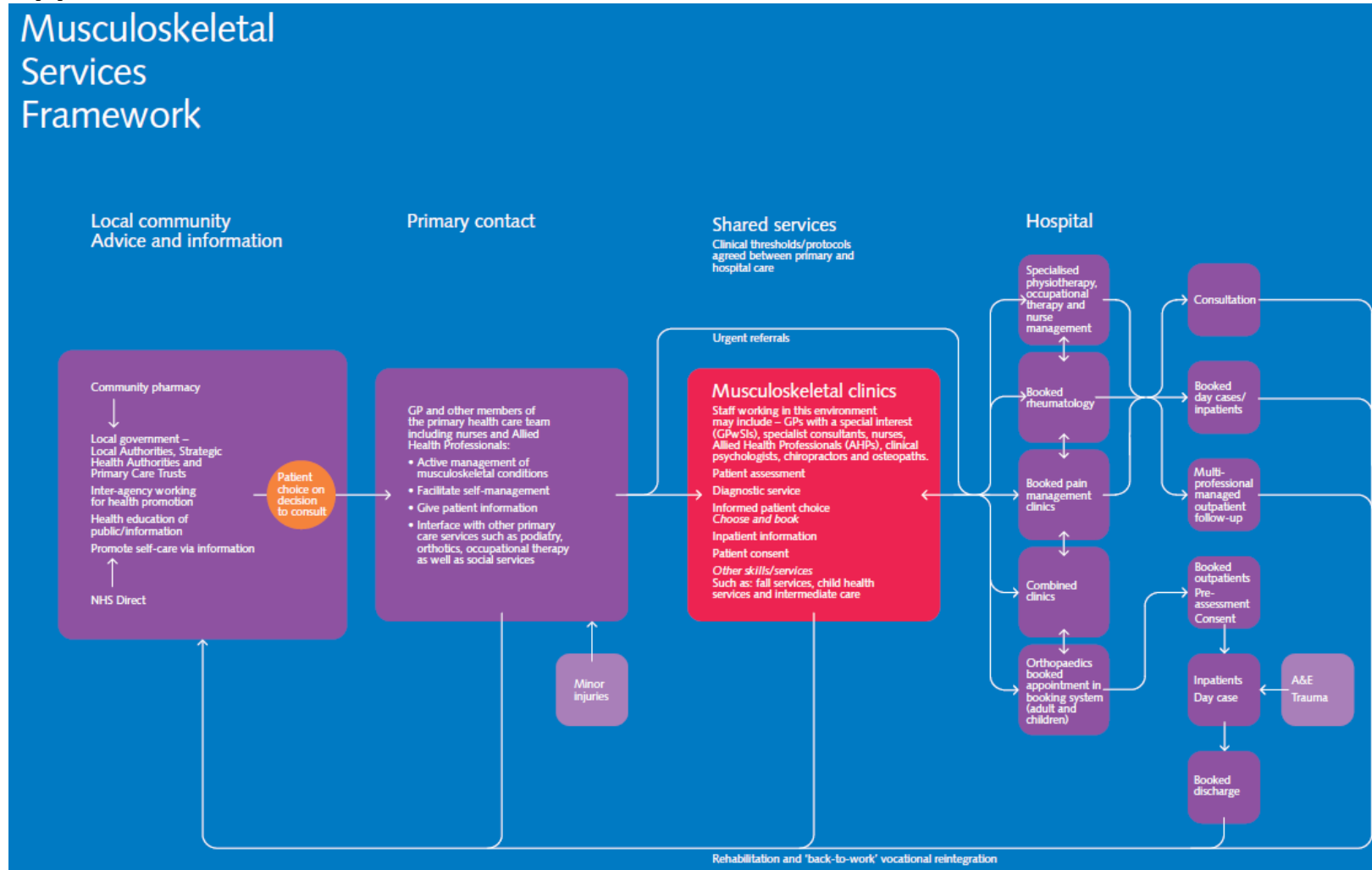


Figure 2 Musculoskeletal Services Framework

Source: (Department of Health (UK), 2006, p 3)