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# **Use of health services for arthritis and osteoporosis**

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and Musculoskeletal Conditions**

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# Summary

This report provides an overview of the use of health services for the management of arthritis and osteoporosis in Australia. Information has been used to generate profiles of health service use for three specific conditions – osteoarthritis, rheumatoid arthritis and osteoporosis.

There is considerable variation in the type and extent of health services used and actions taken to manage the three conditions. While the management of osteoarthritis and rheumatoid arthritis is primarily focused on reducing pain and slowing down disease progression, the focus in the case of osteoporosis is largely on containing its role as a risk factor for fractures and other associated complications.

## Osteoarthritis

Almost 1 in 2 Australians with osteoarthritis consulted a GP or a specialist in the 12 months before the 2007–08 National Health Survey (NHS). An estimated 780,000 people sought treatment for their condition during that period.

Osteoarthritis was managed at a rate of 2.8 per 100 GP consultations in 2008–09 (Britt et al. 2009). It was the eighth most managed problem in that year. Analgesics and non-steroidal anti-inflammatory drugs (NSAIDs) were the most commonly prescribed medicines for the management of osteoarthritis. Joint replacement was the most common surgical procedure performed to reduce pain and other problems associated with the condition.

## Rheumatoid arthritis

More than 4 out of 10 Australians with rheumatoid arthritis reported consulting a GP or a specialist for their condition in the 12 months prior to the 2007–08 NHS. This amounted to an estimated 186,000 people seeking treatment for their problem.

Rheumatoid arthritis was managed by GPs at the rate of 0.4 per 100 encounters in 2008–09 according to the Bettering the Evaluation and Care of Health (BEACH) survey. NSAIDs and disease-modifying anti-rheumatic drugs (DMARDs) were the most commonly prescribed medicines to manage rheumatoid arthritis. A variety of surgical procedures were also performed to keep the joints moving and to prevent deformity due to the condition.

## Osteoporosis

More than 4 out of 10 Australians with osteoporosis consulted a GP or a specialist to manage their condition in the 12 months before the 2007–08 NHS. This equates to an estimated 283,000 people seeking treatment for their problem.

There was a total of 56,095 hospitalisations for osteoporotic fractures of people aged 55 years and over in 2008–09. Of osteoporotic fractures, hip fracture was the most common reason for hospitalisation, followed in order by fractures of the forearm, shoulder and upper arm.



# 1 Introduction

Health care plays a central role in reducing the burden of arthritis and osteoporosis and in improving the quality of life of those affected. Most forms of arthritis have no known cure. The focus in most cases is on relieving pain and reducing symptoms. Osteoporosis is largely preventable; nonetheless, bone loss is common in older people. The need to manage osteoporosis following fracture(s) is critical.

In Australia, the management of arthritis and osteoporosis, and their complications, takes place in a variety of health care settings. These include general practice, allied health establishments, and specialist surgeries and hospitals. Each caters to specific aspects of care.

This report provides a statistical overview of the health services used for the treatment and management of arthritis and osteoporosis in Australia. Health survey and administrative data have been used to describe the nature and type of health services used for each specific condition.

## What are arthritis and osteoporosis?

Arthritis refers to over 100 chronic conditions affecting movable joints. The disease<sup>1</sup> causes damage to joint structures, such as the articular cartilage and synovial lining. Common symptoms are inflammation, pain, stiffness and decreased mobility. Osteoarthritis and rheumatoid arthritis are the two most common forms of arthritis (AIHW 2005).

Osteoarthritis mostly affects the hands, spine, and weight-bearing joints such as hips, knees and ankles. Its main feature is the breakdown of articular cartilage. Pain relief, joint mobility and load reduction help in the management of the condition. More radical treatment, such as joint replacement, is needed to address unrelieved pain and progressive disability in late stages of osteoarthritis (AIHW 2007).

Rheumatoid arthritis is a chronic, auto-immune disease marked by inflammation of the joints, most often affecting the hand joints in a symmetrical fashion. The immune system attacks the synovial tissues lining the joints, causing pain, swelling and stiffness. Over time, the articular cartilage and surrounding muscles and tendons may also be damaged. Early and aggressive management of rheumatoid arthritis is required to minimise its impact (AIHW 2009).

Osteoporosis is the thinning and weakening of bones, increasing the risk of fracture. On a daily basis the skeletal system remodels bone, stripping away old bone and replacing it with new. Osteoporosis is a dysfunction in this bone remodelling process that causes the bone to be broken down faster than it can be replaced, making it brittle and porous. The condition generally has no overt symptoms. Fractures from minimal trauma (for example, a trip and fall while walking) are often the first sign a person may have osteoporosis. The cascade of osteoporotic fractures sets the scene for extensive management and rehabilitation, in particular amongst the elderly (AIHW 2008a, b; 2010a).

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<sup>1</sup> The terms 'disease' and 'condition', have been used interchangeably in this report.

## Management of arthritis and osteoporosis

The treatment and management of arthritis is guided by five basic principles:

- stop the disease process
- keep the joints moving
- prevent deformity
- reconstruct the joints if need be
- rehabilitate.

Central to this strategy is medical management of the condition through medication and surgery (Solomon et al. 2005).

The medicines commonly used to manage arthritis are pain-relieving and inflammation reducing agents such as paracetamol and non-steroidal anti-inflammatory drugs (NSAIDs). For rheumatoid arthritis, disease-modifying anti-rheumatic drugs (DMARDs) are also used to alter the disease process, decrease pain and minimise joint damage (AIHW 2007; 2009).

Dietary supplements also play a role in arthritis management. In osteoarthritis, glucosamine and chondroitin are commonly used for relieving pain and possibly reducing cartilage breakdown (AIHW 2007). In rheumatoid arthritis, omega-3 fish oils and glucosamine are used particularly for managing pain and joint stiffness (AIHW 2009).

Other management options include physical therapy, exercise to reduce joint stiffness, and increase muscle strength especially of muscles surrounding the joints. Weight loss is another effective means to minimise load on the joints as well as pain.

Secondary measures that can be taken to prevent or delay the onset of the various conditions and their complications are adopting a healthy lifestyle, which includes a healthy diet and regular exercise, and avoiding joint injuries and tasks that increase joint strain.

Surgery is effective in more severe cases of osteoarthritis and rheumatoid arthritis (Solomon et al 2005). Often this involves the replacement of various sections of the joint with artificial parts. This treatment option is commonly known as joint replacement or 'arthroplasty'.

The management of osteoporosis is focused on reduction of bone loss. This is generally handled with medicines, including prescription drugs as well as vitamin and mineral supplements. An integral component of the strategy to manage osteoporosis is prevention of falls, to avoid fractures and future fracture cascades, and the treatment of various osteoporotic fractures through both surgical and non-surgical procedures (AIHW 2008a, 2010a).

## Australian health care system

As mentioned earlier, the management of arthritis and osteoporosis in Australia takes place in a variety of health care settings, to cater for different aspects of care. These include general practice, allied health professionals, and specialist surgeries and hospitals (AIHW 2008b). The Australian health care system is largely a government-funded enterprise that provides services across the spectrum of care in these various settings. Nonetheless, much of the health care in Australia outside the hospital system is delivered by private providers.

Patients can choose their own general practitioner (GP) and are reimbursed for all or part of the consultation by the Australian Government through the Medicare Benefits Schedule



(MBS). For secondary and tertiary care, patients may be referred by GPs to specialists, other health professionals, hospitals or community-based health care organisations (Duckett 2007).

Patients can access public hospitals through emergency departments (where they may present at their own initiative), through the ambulance services, or after referral from a medical practitioner. Public hospital emergency and outpatient services are provided free of charge, as is inpatient treatment for public patients. People can also choose to be treated as private patients when they are in hospital, whether the hospital is a public or a private entity (AIHW 2008c).

A range of allied health professionals such as physiotherapists and chiropractors also provide health care. Costs for these services are usually met by the patients themselves or with the support of private health insurance.

## Monitoring health service use

Health care in Australia is mostly organised around medical conditions, integrated broadly across specialities, treatments and services. However, in the absence of linked data, the provision of various health services is recorded in health data as discrete, silo-style activities with limited connectivity. The information generated on the extent and pattern of health service use is limited.

A variety of measures based on a particular type of health service are commonly used to monitor health service use. These include visits to general practitioners, specialists and allied health professionals, hospitalisation, and access to other health care facilities such as Aboriginal Medical Services. Medication use, diagnostic tests, access to prostheses and various surgical procedures can also be indicators of health care use.

The data for these measures may be obtained using various approaches. Three commonly used approaches are:

- self-reports
- reports from health care providers
- administrative records.

Individuals may be asked to provide information about their disease/condition and the action(s) they have taken to remedy the problem. The actions taken might include health risk reduction, visits to various health care providers and other allied professionals, and medication use (Madans & Cohen 2005).

The information provided by the individuals can be supplemented with that obtained from health care providers such as GPs, specialists and allied health professionals. These health professionals are not only able to provide information about the services rendered, but also have information about the structure, functioning and capacity of their system. The provider-based information can also help verify, albeit indirectly, the veracity of certain types of self-reports (Madans & Cohen 2005).

Administrative records, which include data collected as part of the health care system, are other major sources of information. These records result from running the health care system, such as enrolling people, paying claims, approving expenditure and monitoring payments. The records may be person-level or episode-based. Because these records represent large groups of people, sometimes entire populations, they can offer many

advantages. However, the administrative data have several limitations because they were not created explicitly to examine the health or health care of populations (Iezzoni et al. 2005).

In Australia, health service use information can be generated using all three approaches. Population-based health surveys such as the National Health Survey (NHS) are a useful source of self-reported information, not only about the presence of a disease or condition but also about the use of health services and other health-related actions taken to address the problem (ABS 2009a). Data from GPs, such as the Bettering the Evaluation and Care of Health (BEACH) survey of general practice, provide information on the type of health care provided (Britt et al. 2009). Hospital administrative records, such as those compiled into the AIHW National Hospital Morbidity Database, contain useful information about the services provided by diagnosis and about the procedures performed (AIHW 2010b).

## Health care needs

An essential determinant of a population's ability to benefit from health care is the extent of the problem, or disease prevalence, which may also be used as a proxy for health care needs (Stevens & Raftery 1997). The usefulness of this information can be further supplemented by studying the nature of disease severity, disease progression and the effectiveness of interventions available to deal with the problem.

Arthritis and osteoporosis are highly prevalent long-term conditions, particularly among older Australians. In 2007–08, an estimated 3.3 million Australians had arthritis; osteoporosis affected another 692,000 people (ABS 2009b).

Almost one-half of people with arthritis (over 1.6 million) had osteoarthritis; rheumatoid arthritis affected another 428,000 Australians (Table 1.1). Between them these conditions are the most common cause of disability in Australia.

**Table 1.1: Prevalence of osteoarthritis, rheumatoid arthritis and osteoporosis, 2007–08**

| Sex     | Osteoarthritis |                 | Rheumatoid arthritis |                 | Osteoporosis  |                 |
|---------|----------------|-----------------|----------------------|-----------------|---------------|-----------------|
|         | Number ('000)  | Rate (per cent) | Number ('000)        | Rate (per cent) | Number ('000) | Rate (per cent) |
| Males   | 603.9          | 5.9             | 159.2                | 1.5             | 125.1         | 1.2             |
| Females | 1,009.5        | 9.2             | 269.2                | 2.4             | 567.2         | 5.5             |
| People  | 1,613.4        | 7.6             | 428.5                | 2.0             | 692.3         | 3.4             |

### Notes

1. Self-reported doctor-diagnosed cases only.
2. Rates are age-standardised to the Australian population as at 30 June 2001.

Source: AIHW analysis of the ABS 2007–08 National Health Survey CURF.

It is generally important to identify the twin issues of demand for health care (what people are willing to pay or might wish to use in a system of health care), and supply (what can be actually provided), which contribute to the use of health services. Another perspective on health service use can be gleaned from the demand for a particular type of health care.

## Health service use measures

The analysis presented in this report is based on data derived from three different sources, namely:

- National Health Survey (NHS)
- BEACH survey of general practitioners
- AIHW National Hospital Morbidity Database.

A brief overview of these data sources is given at the Appendix.

Several measures, some of them overlapping in the type of information covered, were developed to study the health service use for osteoarthritis, rheumatoid arthritis and osteoporosis in Australia (Table 1.2).

**Table 1.2: Measures of health service use for arthritis and osteoporosis by data type**

| Data source   | Type of data                            |   |  |   |
|---|---|---|--|---|
|   | Measure                                 | Provider/referral/test  | Period/rate  |   |
| National Health Survey<br>2007–08                       | Visit to clinicians                     | GPs/specialists   | 12-month timeframe   |   |
|   | Visit to allied health<br>professionals | Physical therapists   | 12-month timeframe   |   |
|   |   | Other professionals   |  |   |
|   | Medicine use                            | Pharmaceuticals<br>Complementary medicine   | 12-month timeframe   |   |
|   | Imaging                                 | Bone mineral density (BMD)<br>testing   | 12-month timeframe   |   |
| BEACH survey<br>2008–09                                 | General practice visits                 | GP/patient encounter  | Per 100 encounters (visits)  |   |
|   | Medication                              | Pharmaceuticals<br>prescribed/supplied or<br>advised for over the counter<br>purchase | Per 100 occasions of<br>management of the selected<br>problem (reported as rate per<br>100 problems) |   |
|   |   | Referrals   | Orthopedic surgeons  | Per 100 occasions of<br>management of the selected<br>problem |
|   |   |   | Rheumatologists  |   |
|   |   |   | Endocrinologists<br>Physiotherapists   |   |
|   | Pathology tests                         | C-reactive protein  | Per 100 occasions of<br>management of the selected<br>problem  |   |
|   |   | Erythrocyte sedimentation<br>rate (ESR)   |  |   |
| Full blood count  |   |   |  |   |
| Liver function test<br>Rheumatoid factor                |   |   |  |   |
| Imaging   | X-ray                                   | Per 100 occasions of<br>management of the selected<br>problem                         |  |   |
|   | Ultrasound                              |   |  |   |
| AIHW National Hospital<br>Morbidity Database<br>2008–09 | Hospitalisation                         | Number of episodes  | 12-month timeframe<br>(financial year)   |   |
|   | Procedure                               | Surgical  |  |   |
|   |   | Non-surgical  |  |   |
|   | Rehabilitation                          | Other support   |  |   |

## **About this report**

This report is organised into five chapters. This first introductory chapter provides background information about the management of arthritis and osteoporosis. The Australian health care system and the various measures used to monitor health service use are also described.

Since the treatment and management strategies of two major types of arthritis (osteoarthritis and rheumatoid arthritis) are considerably different, the information about their health service use is presented separately in Chapters 2 and 3, respectively.

The focus of Chapter 4 is the prevention of osteoporosis and its complications including susceptibility to fractures. Information about minimal trauma fractures has been used to describe the nature and type of hospital services required for managing the complications of osteoporosis. The findings are discussed in Chapter 5.

Descriptions of the various data sources and methods used in this report are outlined at the Appendix.

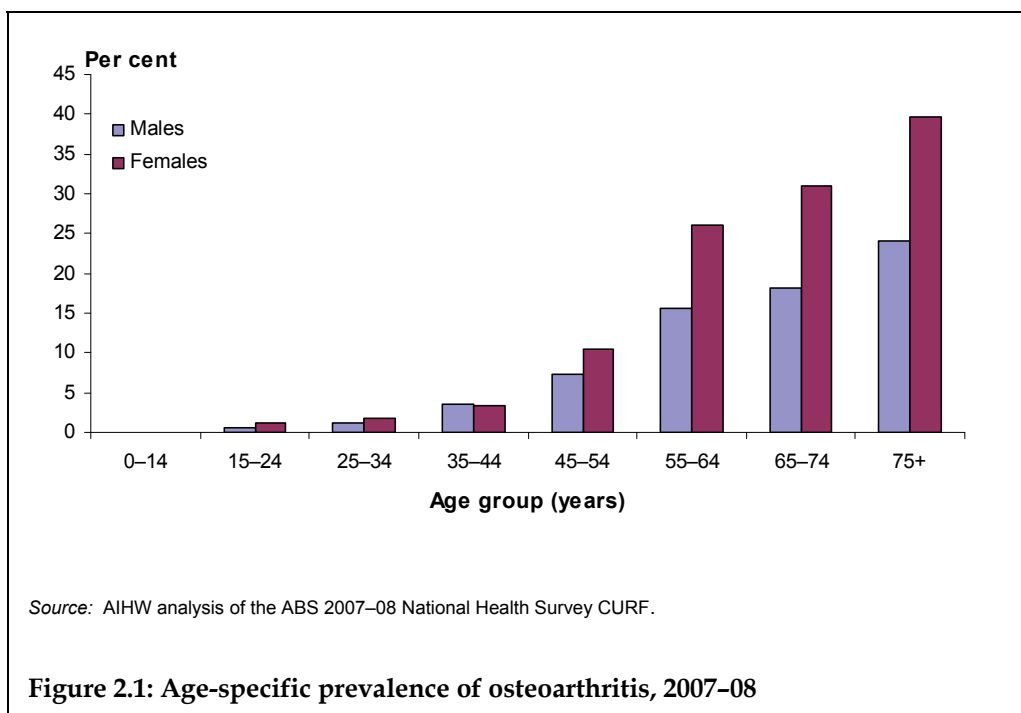
## 2 Health service use for osteoarthritis

The health service use for osteoarthritis can be described as a two-step process. In the early stages of the disease, the focus is on the management of pain and preserving or improving joint function. At the severe end of the disease spectrum, the need for surgical interventions and other support services increases.

This chapter provides information on the use of health services to manage osteoarthritis in primary and tertiary care settings. Information on secondary health care services, such as consultations with specialists, is limited and could not be presented separately from that of primary care.

### Prevalence of osteoarthritis

As described in Chapter 1, an estimated 1.6 million Australians had osteoarthritis in 2007–08. The prevalence of osteoarthritis rises consistently with age, especially after the age of 45 years (Figure 2.1). More females than males are affected – 62.6% of the cases are in females.



### Treatment and management strategies

Osteoarthritis requires consistent and ongoing management. Three principles in the treatment of early osteoarthritis are:

- relieve pain
- reduce load on the joints
- keep the joints moving.

As the symptoms worsen, some form of operative treatment may be required. With unrelieved pain, joint replacement is often the procedure of choice (Solomon et al. 2005).

The diagnosis of osteoarthritis is often uncertain because it can take many years for the disease to develop and before the full range of symptoms appear. Most people with osteoarthritis usually present to their health care provider or GP after the age of 45 years though those with a history of joint disorder or injury may present earlier. X-rays are helpful in monitoring osteoarthritis, in particular the disappearance of the joint space and detecting the formation of small bony growths.

While pain relief in early osteoarthritis is mostly achieved by the use of analgesics and NSAIDs, as well as complementary medicines, joint mobility can be improved further by physical therapy (Refshauge & Gass 2004). Physiotherapists and occupational therapists also provide valuable advice about how to reduce load on the joints by using prostheses and modify daily activities.

Surgery can be dramatically effective for patients with severe osteoarthritis. Joint replacement, both for knee and hip osteoarthritis, is often used (Solomon et al. 2005). However, joint replacements are costly for the patient and warranted only when the discomfort or the limitation in walking is high. Joint replacements are done in a hospital setting, and may be supported by physical therapy and other rehabilitation activities.

## **GPs and other specialists**

GPs are usually the first point of contact for the management of osteoarthritis. They not only provide diagnostic assessments, prescriptions and referrals but also advice on self-management of the condition. Over the course of the disease and depending on its severity, GPs may seek the support from specialists such as, orthopaedic surgeons, rheumatologists and geriatric medical specialists in looking after their patient's problem.

## **Self-reported consultations**

Information on self-reported consultations is derived from two different questions in the 2007–08 NHS: 'type of health professionals consulted in the past 12 months'; and 'frequency of GP check ups'. It should be noted that data for frequency of check ups is obtained from all people who have the condition, not only those who visited a doctor.

An estimated 320,000 males and 460,000 females, aged 15 years and over, had consulted a GP or a specialist for their osteoarthritis in the 12 months prior to the 2007–08 NHS (Table 2.1). Females with osteoarthritis are more likely to consult a GP or a specialist in that timeframe than males with the condition.

**Table 2.1: Visits to GPs or specialists by people with osteoarthritis, 2007–08**

| Sex     | People with osteoarthritis |                 |
|---------|----------------------------|-----------------|
|         | Number ('000)              | Rate (per cent) |
| Males   | 320.4                      | 33.8            |
| Females | 459.9                      | 61.1            |

*Notes*

1. Doctor-diagnosed cases, ages 15 years and over (N=1.6 million).
2. Visits to GPs or specialists in the 12 months prior to the survey.
3. Rates (in per cent) are age-standardised to the Australian population as at 30 June 2001. The age standardised rates are different to the crude rates as the population with specific conditions has a different age structure to the 2001 population.

Source: AIHW analysis of the ABS 2007–08 National Health Survey CURF.

More than 1 out of 5 people (21.5%) consulted a GP or a specialist at least once a month for their osteoarthritis; another 29.3% consulted one every 3 months. Almost 1 out of 8 people reported seeing a GP or a specialist on an annual basis. People with osteoarthritis visited a GP or a specialist for their condition around five times a year on average; an estimated total of eight million consultations each year (Table 2.2).

**Table 2.2: Frequency of visits to GPs or specialists for osteoarthritis, 2007–08**

| Visit frequency       | People with osteoarthritis |          |
|-----------------------|----------------------------|----------|
|                       | Number ('000)              | Per cent |
| At least once a month | 346.3                      | 21.5     |
| Every 3 months        | 472.1                      | 29.3     |
| Every 6 months        | 288.0                      | 17.9     |
| Annual                | 213.9                      | 13.3     |
| Other                 | 346.3                      | 18.2     |
| Total                 | 1,613.4                    | 100.0    |

*Notes*

1. Doctor-diagnosed cases, ages 15 years and over.
2. Visits to GPs or specialists in the 12 months prior to the survey.

Source: AIHW analysis of the ABS 2007–08 National Health Survey CURF.

## GP-reported consultations

According to the BEACH survey, osteoarthritis was managed at a rate of 2.8 per 100 encounters with a GP in 2008–09 (Britt et al. 2009). It was the eighth most frequently managed problem, accounting for 1.8% of all problems managed in general practice.

## Allied health professionals

Allied health professionals contribute to osteoarthritis management in helping improve joint function and in developing skills for self-care. Chiropractors, physiotherapists, podiatrists and hydrotherapists may be consulted by people with osteoarthritis of their own accord or

on a clinician's recommendation. Physiotherapists tend to receive more GP or specialist referrals than other health professionals.

### Self-reported physical therapy

An estimated 7.9% 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 2.0% of the survey respondents.

### GP recommendations for physical therapy

The BEACH survey indicates that in 2008–09, osteoarthritis referrals were made at a rate of 13.7 per 100 osteoarthritis problems managed, 56% of these being to medical specialists (particularly orthopaedic surgeons) and 42% to allied health services (particularly physiotherapists) (Table 2.3).

**Table 2.3: Management of osteoarthritis by general practitioners, 2008–09**

| Type of management                    | Actions taken/recommended |   |
|---------------------------------------|---------------------------|---|
|                                       | Number                    | Rate per 100 problems managed (n=2,666) |
| Medication                            | 2,288                     | 85.8                                    |
| Referral                              | 365                       | 13.7                                    |
| <i>Specialist (all)</i>               | 206                       | 7.7                                     |
| <i>Orthopaedic surgeon</i>            | 154                       | 5.8                                     |
| <i>Rheumatologist</i>                 | 19                        | 0.7                                     |
| <i>Allied health services (all)</i>   | 153                       | 5.8                                     |
| <i>Physiotherapist</i>                | 116                       | 4.4                                     |
| Pathology testing                     | 218                       | 8.2                                     |
| <i>C-reactive protein</i>             | 12                        | 0.5                                     |
| <i>Erythrocyte sedimentation rate</i> | 30                        | 1.1                                     |
| <i>Full blood count</i>               | 47                        | 1.8                                     |
| Imaging                               | 481                       | 18.0                                    |
| <i>Plain X-ray</i>                    | 431                       | 16.2                                    |
| <i>Ultrasound</i>                     | 19                        | 0.7                                     |

Source: AIHW analysis of the 2008–09 BEACH data collected by the Australian General Practice Statistics and Classification Centre, University of Sydney, in collaboration with the AIHW.

### In-hospital physical therapy

According to the AIHW National Hospital Morbidity Database, almost 274,000 non-surgical procedures were performed with the principal diagnosis of osteoarthritis in 2008–09. These mainly included physiotherapy (63,856), occupational therapy (23,644) and administration of therapeutic medicines (6,089).



## GP referrals

### Referrals to specialists

The BEACH survey indicates that in 2008–09, osteoarthritis referrals were made at a rate of 13.7 per 100 osteoarthritis problems managed (Table 2.3). Most of the referrals were to orthopaedic surgeons at a rate of 5.8 per 100 osteoarthritis problems managed.

### Pathology, radiology and ultrasound

Pathology tests are not generally required for the diagnosis or management of osteoarthritis. Pathology tests were ordered at a rate of 8.2 per 100 osteoarthritis problems managed. Erythrocyte Sedimentation Rate (ESR), full blood count, liver function test and rheumatoid factor were ordered by GPs at a rate of 1 to 2 per 100 osteoarthritis problems managed (Table 2.3).

Plain X-rays were ordered at a rate of 16 per 100 osteoarthritis problems managed and ultrasound at a rate of 0.7 per 100 (Table 2.3).

## Medicine use

A variety of medicines are used to manage osteoarthritis (Box 2.1). Administered in many different forms, including topical treatments and ointments, these medicines are used to alleviate inflammation and pain.

### Box 2.1: Medicines for managing osteoarthritis

A variety of pharmaceutical medicines are used for managing osteoarthritis. These may be supplemented by various complementary or alternative medicines.

**Analgesics** are medications that relieve pain. Common analgesics include paracetamol, tramadol and various paracetamol combinations.

**Non-steroidal anti-inflammatory drugs, or NSAIDs**, are used to relieve symptoms of pain, stiffness and inflammation in the muscles, joints and bones. Medications within this group include celecoxib, meloxicam, ibuprofen, diclofenac and naproxen.

The NSAIDs function by blocking the activity of the enzyme cyclooxygenase (COX), which participates in the synthesis of prostaglandin, a protein that contributes to inflammation and pain. They can be selective or non-selective in their COX blocking properties. Selective NSAIDs block only the COX-2 isoenzyme, relieving inflammation without causing stomach irritations. Selective NSAIDs are also referred to as COX-2 inhibitors. Non-selective NSAIDs block both the COX-1 and COX-2 isoenzymes. The latter are effective against inflammation but can cause irritation in the stomach, producing gastric ulcers and reflux.

**Complementary medicines** such as glucosamine, chondroitin and fish oils are commonly used to relieve pain and slow down cartilage destruction.

## Pharmaceutical medicines

According to the BEACH survey, pharmaceutical medication was the most common management strategy used by GPs to manage osteoarthritis, with medicines being

prescribed, advised or supplied at a rate of 85.8 per 100 osteoarthritis problems managed in 2008–09 (Table 2.3).

Analgesics such as paracetamol and paracetamol combinations (e.g. paracetamol and codeine) were prescribed, supplied, or advised by GPs at a rate of 32.4 per 100 osteoarthritis problems managed (Table 2.4). The NSAIDs, mainly COX-2 inhibitors such as meloxicam (n=323) and celecoxib (n=205), were the second line of therapy for osteoarthritis.

**Table 2.4: Top 10 medications prescribed, supplied, or advised by GPs for osteoarthritis, 2008–09**

| Type of medication         | Class                 | Pharmaceutical prescriptions |   |
|----------------------------|-----------------------|------------------------------|---|
|                            |                       | Number                       | Rate per 100 problems managed (n=2,666) |
| Paracetamol                | Non-opioid analgesic  | 696                          | 26.1                                    |
| Meloxicam                  | NSAID (selective)     | 323                          | 12.1                                    |
| Celecoxib                  | NSAID (selective)     | 205                          | 7.7                                     |
| Paracetamol/codeine        | Opioid analgesic      | 168                          | 6.3                                     |
| Tramadol                   | Opioid analgesic      | 114                          | 4.4                                     |
| Diclofenac sodium systemic | NSAID (non-selective) | 96                           | 3.6                                     |
| Buprenorphine              | Opioid analgesic      | 89                           | 3.4                                     |
| Oxycodone                  | Opioid analgesic      | 67                           | 2.5                                     |
| Naproxen                   | NSAID (non-selective) | 65                           | 2.5                                     |
| Glucosamine                | Natural medicine      | 76                           | 2.8                                     |

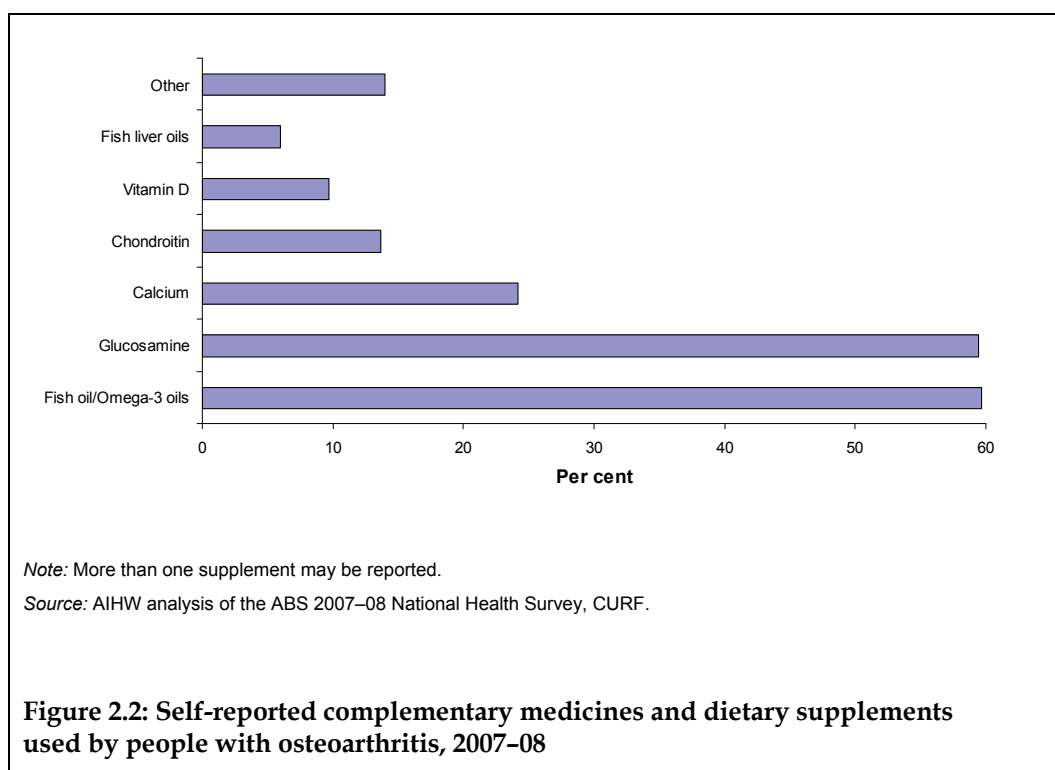
*Source:* AIHW analysis of the 2007–08 BEACH data collected by the Australian General Practice Statistics and Classification Centre, University of Sydney, in collaboration with the AIHW.

### Self-reported use of complementary medicines and dietary supplements

More than one-half of people with osteoarthritis (50.7%) reported taking supplements or natural remedies for their osteoarthritis (2007–08 NHS). Glucosamine and chondroitin may reduce pain in people with mild to moderate symptoms of osteoarthritis, although evidence for the effectiveness of these supplements is limited.

According to the NHS data, omega-3 fish oils and glucosamine were the two most common supplements taken for osteoarthritis (Figure 2.2). Other dietary supplements commonly used by people with osteoarthritis include calcium, chondroitin (shark cartilage) and vitamin D.

Complementary medicines are more commonly used by females than males.



## Hospital use

As described earlier, hospitalisation for osteoarthritis is usually for surgical interventions. In 2008–09, there were more than 88,000 hospitalisations with a principal diagnosis of osteoarthritis. Over 102,000 surgical and 273,000 non-surgical procedures were performed during these hospitalisations. The average length of hospital stay was 6.9 days.

## Surgical procedures

A variety of surgical procedures are performed to reduce pain and improve mobility in people with severe osteoarthritis, the most common of which are described in Box 2.2.

### Box 2.2: Common surgical procedures for osteoarthritis

**Osteotomy:** is used to correct deformity, to change the shape of the bone, or to relieve pain by redirecting the load trajectories.

**Arthroscopy:** is performed for both diagnostic and therapeutic purposes. Arthroscopic debridement and lavage can successfully alleviate symptoms, particularly in the case of degenerative meniscal tears in the presence of mechanical symptoms. However, in cases with substantial joint-space narrowing, arthroscopic surgery has limited benefits.

**Arthrodesis, or joint fusion:** is the most reliable operation for a painful or unstable joint. The procedure successfully alleviates pain and is commonly performed in the spine and in small points of the wrist, hand and ankle.

**Arthroplasty:** is the replacement of joints with prosthetic implants. Total joint arthroplasty is the most significant advancement in the treatment of osteoarthritis. It is the mainstay of surgical treatment of the osteoarthritic hip, knee, and glenohumeral joints. The pain and disability of end-stage osteoarthritis can be eliminated, restoring patients to near normal function.

Source: Solomon et al. 2005.

In 2008-09, about 46% of hospitalisations with a principal diagnosis of osteoarthritis involved total arthroplasty or joint replacement (Table 2.5). Arthroscopy was the other common surgical procedure performed. Depending on the site and severity of osteoarthritis, surgical procedures such as biopsy, administration of therapeutic agents, and repair of skin and subcutaneous tissue were also performed.

Table 2.5: Common surgical procedures performed for osteoarthritis, 2008-09

| Type of procedure  | Surgical procedures |              |
|--|---------------------|--------------|
|  | Number              | Per cent*    |
| Total arthroplasty of knee, unilateral   | 27,452              | 26.8         |
| Total arthroplasty of hip, unilateral  | 19,487              | 19.1         |
| Arthroscopic meniscectomy of knee with debridement, osteoplasty or chondroplasty | 9,319               | 9.1          |
| Hemiarthroplasty of knee   | 2,592               | 2.5          |
| Arthroscopic chondroplasty of knee   | 2,075               | 2.0          |
| Other  | 41,259              | 40.5         |
| <b>Total</b>   | <b>102,184</b>      | <b>100.0</b> |

\* Per cent of total surgical procedures (N= 102,184) performed with osteoarthritis as the principal diagnosis.

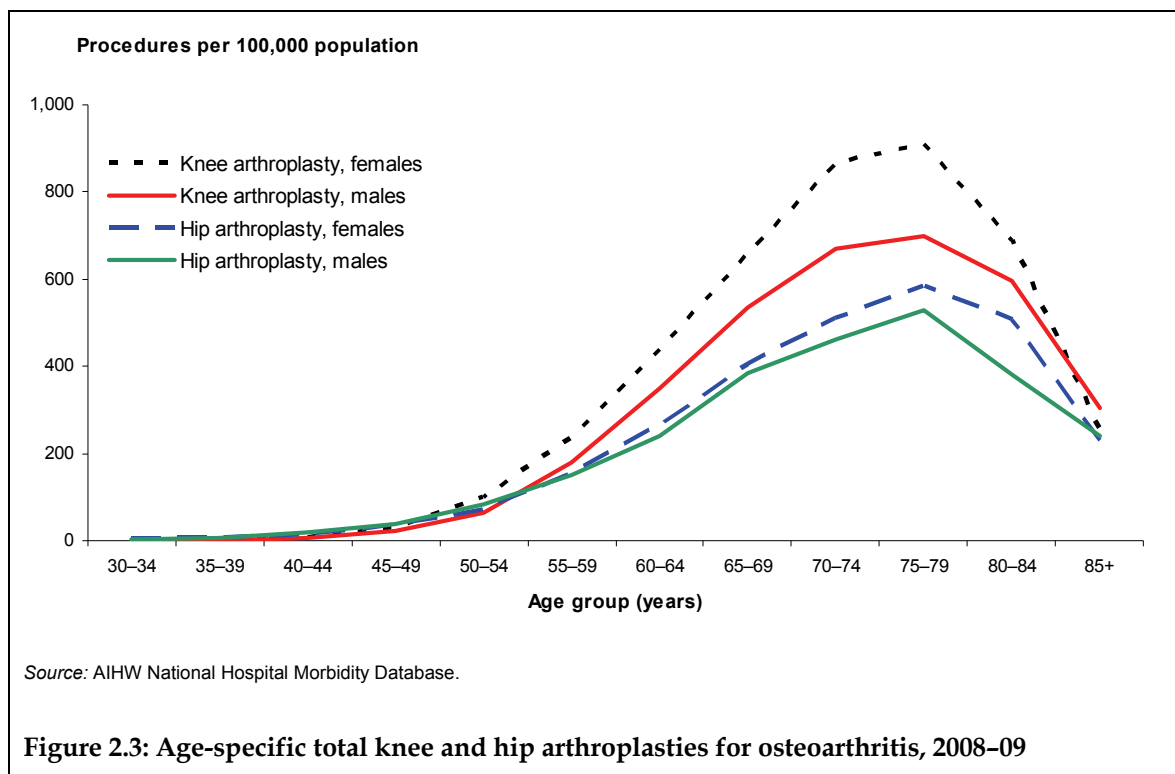
#### Notes

1. Procedures have been counted only once for each hospitalisation, although those may have been performed more than once during that particular hospital stay.

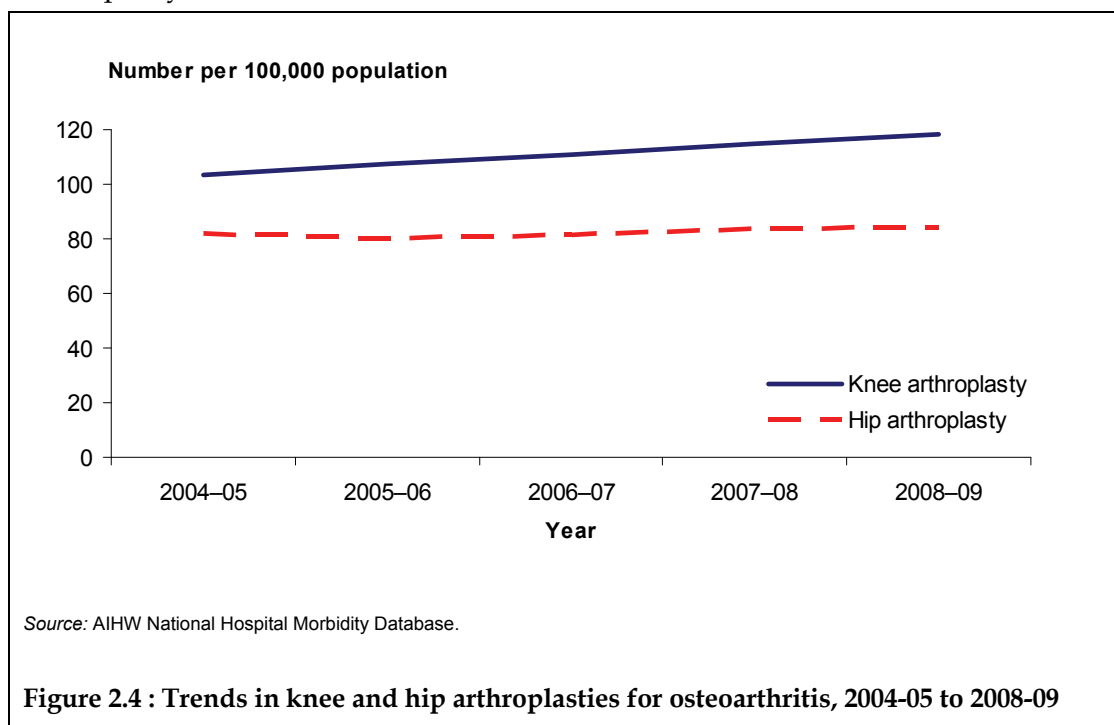
Source: AIHW National Hospital Morbidity Database.

Knee arthroplasty was the most common joint replacement procedure performed for osteoarthritis in 2008-09, at the rate of 118 per 100,000 population. This particular type of

joint replacement was more common in females, mainly those in the 75–79 years age group. Hip arthroplasty, performed at the rate of 84 procedures per 100,000 population, was more common among females aged 70–74 years than among males in the same age group (Figure 2.3).



Arthroplasty as a procedure to reduce the impact of osteoarthritis is increasing. Over the period 2004–05 to 2008–09, the rate for knee arthroplasty increased from 103 per 100,000 to 118 per 100,000 population (Figure 2.4). A slight upward trend is also noted in hip arthroplasty.



### **Non-surgical procedures**

Over 274,000 non-surgical procedures were also listed in hospitalisations with a principal diagnosis of osteoarthritis in 2008–09. Mainly non-invasive in nature, these procedures mostly included allied health interventions such as physiotherapy, occupational therapy and the administration of medicines.

### 3 Health service use for rheumatoid arthritis

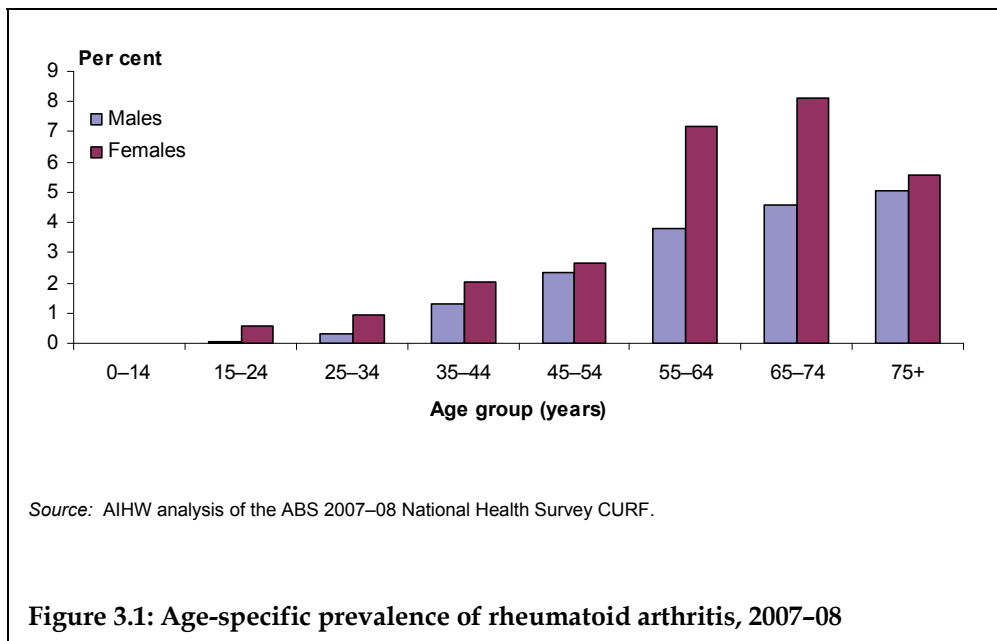
Health service use by people with rheumatoid arthritis is generally more exhaustive than that for osteoarthritis because of its systemic nature and a variety of associated complications. There is no cure for rheumatoid arthritis; however, much can be done to alleviate symptoms and slow down progression of the disease.

The ideal management of rheumatoid arthritis requires a multidisciplinary approach, through a therapeutic team including a GP, a rheumatologist, an orthopaedic surgeon, and one or more allied health professionals (such as a physiotherapist and/or an occupational therapist) (Fries 2000).

The information presented in this chapter covers aspects of the management of rheumatoid arthritis in various health care settings.

#### Prevalence of rheumatoid arthritis

Rheumatoid arthritis affects an estimated 428,500 Australians, with a prevalence rate of 2.0% (ABS 2009b). About two-thirds of those affected are females. The prevalence rate for rheumatoid arthritis is highest in ages 55–74 years (Figure 3.1).



There is concern that the National Health Survey (NHS) overestimates the prevalence of rheumatoid arthritis in Australia. This may be due to the confusion of the disease with ‘rheumatism’; a general term often used for musculoskeletal pain by older people. This overestimation may affect the calculation of health service use rates for rheumatoid arthritis. Description of the NHS is given at the Appendix.

# Treatment and management strategies

An important target in the management of rheumatoid arthritis is its early diagnosis and immediate treatment (Symmons & Silman 2006). The key elements of the current approach to management of rheumatoid arthritis are (Rheumatology Expert Group 2006):

- early diagnosis and commencement with disease-modifying anti-rheumatic drug (DMARD) treatment
- stopping the disease process
- preventing deformity
- regular monitoring for drug efficacy and toxicity
- active patient participation in management of the condition.

Rheumatoid arthritis progresses rapidly. Within the first few months of its onset, a person can develop irreversible joint damage and deformities (Solomon et al. 2005). Although tissues throughout the body are affected, because of its systemic nature, the synovium bears the brunt of the disease (synovium is a capsule around the movable joints, filled with a lubricating fluid secreted by the surrounding synovial membranes). The process which involves inflammation and thickening of the synovial membrane is called synovitis. Persistent inflammation causes tissue destruction, erodes cartilage and may rupture tendon fibres. Secondary osteoarthritis may be present in the end stages of rheumatoid arthritis.

However, the disease takes a variable and unpredictable course, ranging from a single attack to an aggressive, relentless progression. In 80% of cases, the disease follows a slowly progressive course with intermittent flare-ups. With time, these attacks become less frequent and the disease may become virtually dormant. In 5% of cases, the disease is unrelenting requiring aggressive management. In rare cases, it may subside after an explosive start and follow a relatively mild course (Koehn et al. 2002).

Early diagnosis of rheumatoid arthritis is central to its effective management. The minimal criteria for diagnosing rheumatoid arthritis are bilateral, symmetrical polyarthritis; involvement of proximal joints of hands or feet; and presence of the symptoms for at least 6 weeks. The diagnosis can be further supported by testing for rheumatoid factor and the detection of subcutaneous nodules or periarticular erosions on X-rays (van Gestel & van Riel 1997).

During the early phase of rheumatoid arthritis (the first 6 to 12 months) the main problem is the control of synovitis. The use of NSAIDs and disease-modifying anti-rheumatic drugs (DMARDs) is now recommended early in treatment (van Gestel et al. 1997). Additional measures include the injection of long-acting corticosteroid preparations into inflamed joints.

Non-pharmacological treatment for rheumatoid arthritis includes physical therapy, weight loss and occupational therapy. Regular exercise is important for maintaining joint mobility and making the joint muscles stronger.

Reconstructive surgery is often required in late stages of the disease. Procedures such as arthrodesis, osteotomy and arthroplasty all have their place (Solomon et al. 2005). The provision of medical aids and adjustments to the work and living environment are also helpful in improving the quality of life of people with rheumatoid arthritis.



## GPs and specialists

Specialists play a greater role in managing rheumatoid arthritis than osteoarthritis. A major reason for this difference is that many patients need regular specialist advice for the management of their disease. These specialists (in particular rheumatologists) are better placed to make correct and timely diagnosis of the condition (Emery 2002). However, consultations with specialists may vary in frequency depending upon the stage of the disease.

### Self-reported consultations

An estimated 72,000 males and 114,000 females aged 15 years and over had consulted a GP or a specialist for their rheumatoid arthritis in the 12 months prior to the 2007–08 NHS (Table 3.1). Almost 45% of males with doctor-diagnosed rheumatoid arthritis had consulted a GP or a specialist; the proportion was slightly lower among females.

**Table 3.1: Visits to GPs or specialists for rheumatoid arthritis 2007–08**

| Sex     | People with rheumatoid arthritis |                 |
|---------|----------------------------------|-----------------|
|         | Number ('000)                    | Rate (per cent) |
| Males   | 72.4                             | 44.1            |
| Females | 113.6                            | 36.2            |

#### Notes

1. Doctor-diagnosed cases, ages 15 years and over (N=428, 500).
2. Visits to GPs or specialists in the 12 months prior to the survey.
3. Rates (in per cent) are age-standardised to the Australian population as at 30 June 2001. The age standardised rates are different to the crude rates as the population with specific conditions has a different age structure to the 2001 population.

Source: AIHW analysis of the ABS 2007–08 National Health Survey CURF.

Almost a quarter of people with rheumatoid arthritis reported visiting a GP or a specialist at least once a month for their disease (Table 3.2). Another 27.9% had these consultations once every quarter.

**Table 3.2: Frequency of visits to GPs or specialists for rheumatoid arthritis, 2007–08**

| Visit frequency       | People with rheumatoid arthritis |          |
|-----------------------|----------------------------------|----------|
|                       | Number ('000)                    | Per cent |
| At least once a month | 102.0                            | 23.8     |
| Every 3 months        | 119.7                            | 27.9     |
| Every 6 months        | 74.8                             | 17.5     |
| Annual                | 40.2                             | 9.4      |
| Other                 | 91.8                             | 21.4     |
| Total                 | 428.5                            | 100.0    |

Source: AIHW analysis of the ABS 2007–08 National Health Survey CURF.

On average, people with rheumatoid arthritis reported consulting their GP/specialist between 5 and 6 times over the 12-month period. The reported frequency of GP/specialist consultations for rheumatoid arthritis was more than that for osteoarthritis (see Table 2.2 for comparison). This variation reflects the very different natural histories, symptoms and treatment requirements of the two conditions.

### **Consultations reported by general practitioners**

According to the BEACH survey, rheumatoid arthritis was managed at a rate of 0.4 per 100 GP-patient encounters, and accounted for 0.3% of all the problems GPs managed in 2008–09 (Britt et al. 2009).

### **Allied health professionals**

Allied health professionals 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.

### **Self-reported physical therapy**

Almost 1 in 12 people with rheumatoid arthritis (8.6%) reported seeking help from an allied health professional in the 12 months prior to the 2007-08 NHS. Chiropractors/podiatrists and physiotherapists/hydrotherapists were consulted by less than 2.0% of people with rheumatoid arthritis.

### **Recommendations for physical therapy by general practitioners**

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 (Table 3.3).

### **In-hospital physical therapy**

No separate estimates of consultations with physiotherapists are available from the hospital data. However, almost 12,000 non-surgical procedures were listed in the AIHW National Hospital Morbidity Database with a principal diagnosis of rheumatoid arthritis in 2008–09. Almost 12% of these were for allied health interventions such as physiotherapy and occupational therapy.

## **Management by general practitioners**

### **Referrals to specialists**

The 2008–09 BEACH survey collected 49 referrals for rheumatoid arthritis by GPs to specialists such as rheumatologists and orthopaedic surgeons (Table 3.3). A large majority of these referrals were to rheumatologists, at a rate of 8.8 per 100 rheumatoid arthritis problems managed.

**Table 3.3: Management of rheumatoid arthritis in general practice, 2008–09**

| Type of management                    | Management action by GPs |                                       |
|---------------------------------------|--------------------------|---------------------------------------|
|                                       | Number                   | Rate per 100 problems managed (n=466) |
| Referrals                             | 63                       | 13.6                                  |
| <i>Specialists (all)</i>              | 49                       | 10.4                                  |
| <i>Rheumatologist</i>                 | 41                       | 8.8                                   |
| <i>Orthopaedic surgeon</i>            | 3                        | 0.6                                   |
| <i>Allied health services (all)</i>   | 11                       | 2.4                                   |
| <i>Physiotherapist</i>                | 10                       | 2.1                                   |
| Pathology                             | 302                      | 64.8                                  |
| <i>C-reactive protein</i>             | 36                       | 7.7                                   |
| <i>Erythrocyte sedimentation rate</i> | 43                       | 9.2                                   |
| <i>Full blood count</i>               | 74                       | 15.9                                  |
| <i>Liver function test</i>            | 49                       | 10.5                                  |
| <i>Rheumatoid factor</i>              | 14                       | 3.0                                   |
| Imaging                               | 39                       | 8.4                                   |
| X-ray                                 | 30                       | 6.4                                   |
| Ultrasound                            | 5                        | 1.1                                   |

Source: AIHW analysis of the 2008–09 BEACH data collected by the Australian General Practice Statistics and Classification Centre, University of Sydney, in collaboration with the AIHW.

## Pathology, radiology and ultrasound

Unlike osteoarthritis, pathology tests are used commonly for the diagnosis and management of rheumatoid arthritis. According to the BEACH survey, in 2008–09 pathology tests were ordered at a rate of 64.8 per 100 rheumatoid arthritis problems managed. The most commonly ordered were full blood count test (15.9 per 100 rheumatoid arthritis problems) and liver function (10.5 per 100). Testing for C-reactive protein was requested at a rate of 7.7 per 100 rheumatoid arthritis problems managed. C-reactive protein test is done to measure the extent of inflammation.

During 2008–09, referral for an X-ray was at a rate of 6.4 per 100 rheumatoid arthritis problems managed. Ultrasound was sought for a little over 1 per 100 rheumatoid arthritis problems managed.

## Medicine use

### Pharmaceutical medicines

The pharmacological treatment of rheumatoid arthritis can be broadly divided into disease-modifying anti-rheumatic drugs (DMARDs), anti-inflammatory agents (NSAIDs) and analgesics (Box 3.1). Cortisone injections can be valuable adjuncts to a long-term treatment plan. Low dosages of daily cortisone (e.g. prednisone or prednisolone) can also have an

important benefit if added to a treatment. In recent times, the newer group of biologics (bDMARDs) has increased the treatment options (Majithia & Geraci 2007).

**Box 3.1: Types of medications used for managing rheumatoid arthritis**

**Disease-modifying anti-rheumatic drugs, or DMARDs**, are immunosuppressant drugs used for altering the disease progression by broadly suppressing the immune system. Medications in this group include methotrexate, sulfasalazine, leflunomide and hydroxychloroquine.

**Biological disease-modifying anti-rheumatic drugs, or bDMARDs**, are specialised immunosuppressant medications that alter disease progression by stopping specific cellular communication in the immune system. Only prescribed by rheumatologists, medicines in this group include etanercept, adalimumab, infliximab, anakinra and rituximab.

**Non-steroidal anti-inflammatory drugs, or NSAIDs**, are used to relieve symptoms of pain, stiffness and inflammation in the muscles, joints and bones. Medications within this group include celecoxib, meloxicam, ibuprofen, diclofenac and naproxen. For additional details about NSAIDs, see Box 2.1.

**Analgesics** are used to relieve pain. Common among these are paracetamol, tramadol and various paracetamol combinations, mostly available over the counter.

According to the BEACH survey, in 2008–09, medicines were prescribed, advised or supplied for rheumatoid arthritis at a rate of 99 per 100 rheumatoid arthritis problems managed. The top 10 medicines given by GPs for rheumatoid arthritis are listed in Table 3.4.

**Table 3.4: Top 10 medications prescribed, advised or supplied by GPs for rheumatoid arthritis, 2008–09**

| Type of medicine      | Class                                      | Pharmaceutical prescriptions |                                       |
|-----------------------|--|------------------------------|---------------------------------------|
|                       |  | Number                       | Rate per 100 problems managed (n=466) |
| Methotrexate          | DMARD                                      | 90                           | 19.3                                  |
| Prednisone            | Corticosteroid                             | 35                           | 7.4                                   |
| Prednisolone          | Corticosteroid                             | 27                           | 5.9                                   |
| Celecoxib             | NSAID (selective)                          | 26                           | 5.6                                   |
| Paracetamol           | Non-opioid analgesic                       | 25                           | 5.4                                   |
| Hydroxychloroquine    | DMARD                                      | 25                           | 5.4                                   |
| Meloxicam             | NSAID (selective)                          | 24                           | 5.2                                   |
| Oxycodone             | Opioid analgesic                           | 17                           | 3.6                                   |
| Tramadol              | Opioid analgesic                           | 15                           | 3.2                                   |
| Sodium aurothiomalate | Specific Antirheumatic agents              | 13                           | 2.9                                   |
| Folic Acid            | Solution affecting the electrolyte balance | 13                           | 2.9                                   |
| Leflunomide           | DMARD                                      | 12                           | 2.6                                   |

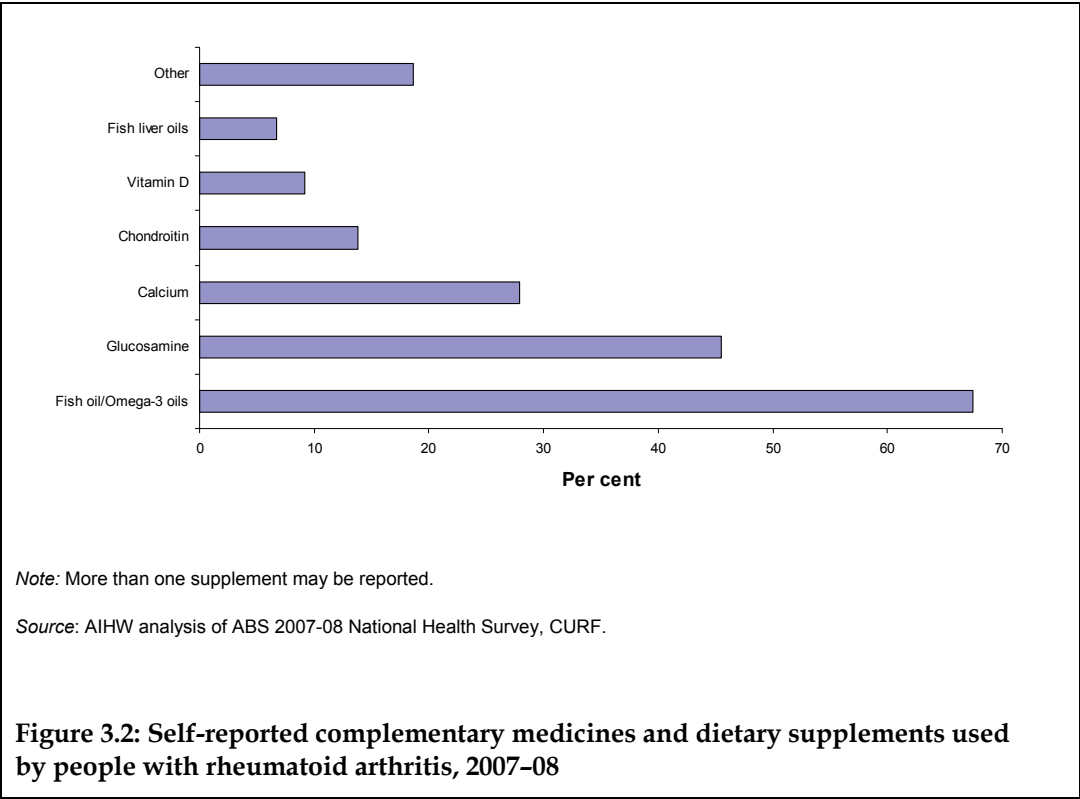
Source: AIHW analysis of the 2008–09 BEACH data collected by the Australian General Practice Statistics and Classification Centre, University of Sydney, in collaboration with the AIHW.

Methotrexate, a DMARD, was the most common medicine prescribed/ advised/ supplied (19.3 per 100 rheumatoid arthritis problems). The provision of the corticosteroids, prednisone (7.4 per 100) and prednisolone (5.9 per 100), was also frequent.

### Complementary medicines and dietary supplements

Many people with rheumatoid arthritis take complementary medicines or dietary supplements along with their prescription medicine. There is some evidence of the role of certain supplements and natural therapies in managing rheumatoid arthritis (Vitetta et al. 2008). In particular, supplements containing omega-3 fatty acids have been found to reduce the pain, inflammation and stiffness in people with the condition (RACGP 2008; Goldberg & Katz 2007).

An estimated 48.7% of people with rheumatoid arthritis, based on the 2007-08 NHS, used complementary medicine for the management of their disease (Figure 3.2). The supplements most commonly used were omega-3 fish oils and glucosamine.



All types of supplements were used more commonly by females than males, except chondroitin/shark cartilage, which was used more commonly by males.

### Hospitalisation

Hospitalisation for rheumatoid arthritis is much less frequent as most of the consultations for the condition occur in general practice, specialist clinics or as outpatient care.

In 2008–09, there were 9,000 hospitalisations with a principal diagnosis of rheumatoid arthritis; more than 3,600 surgical and 12,000 non-surgical procedures were performed at these hospitalisations. The average length of hospital stay was 10.9 days.

## Surgical procedures

Surgical procedures for rheumatoid arthritis are mainly to relieve pain and improve function (Saito 2002). Both joint protective and joint reconstruction surgeries are used.

In joint protective surgery, the bulk of synovial tissue is removed to inhibit rapid progression of joint destruction. The joint reconstructive surgery compensates for functional deficit in an extremity by arthroplasty (both endoprosthesis and arthrodesis) which improves mobility and independence.

Knee replacement (a type of arthroplasty) was the most common surgical procedure performed on people with rheumatoid arthritis in 2008–09 (Table 3.5). The surgical fusion (arthrodesis) of the first metatarsophalangeal joint and total arthroplasty of the hip were other common surgical procedures. Excision of lesion of soft tissue was also performed in more than 3% of surgical procedures.

**Table 3.5: Common surgical procedures performed for rheumatoid arthritis, 2008–09**

| Type of procedure   | Surgical procedures |              |
|---|---------------------|--------------|
|   | Number              | Per cent     |
| Total arthroplasty of knee, unilateral  | 319                 | 8.7          |
| Arthrodesis of 1st metatarsophalangeal joint  | 152                 | 4.2          |
| Total arthroplasty of hip, unilateral   | 142                 | 3.9          |
| Administration of agent into joint or other synovial cavity, not elsewhere classified | 124                 | 3.4          |
| Excision of the lesion of soft tissue, not elsewhere classified                       | 123                 | 3.4          |
| Other procedures  | 2,790               | 76.4         |
| <b>Total</b>  | <b>3,650</b>        | <b>100.0</b> |

### Notes

1. Per cent of total surgical procedures (N= 3,650) performed with rheumatoid arthritis as the principal diagnosis.
2. Procedures have been counted only once for each hospitalisation, although those may have been performed more than once during that particular hospital stay.

Source: AIHW National Hospital Morbidity Database.

## Non-surgical procedures

In 2008–09, more than 12,000 non-surgical procedures were performed on people hospitalised with a principal diagnosis of rheumatoid arthritis. These procedures, mainly non-invasive in nature, included therapeutic, cognitive or diagnostic interventions. The most common non-surgical procedures performed were administration of pharmacotherapy, mainly intravenous administration (38.7%) and physiotherapy (12.5%).

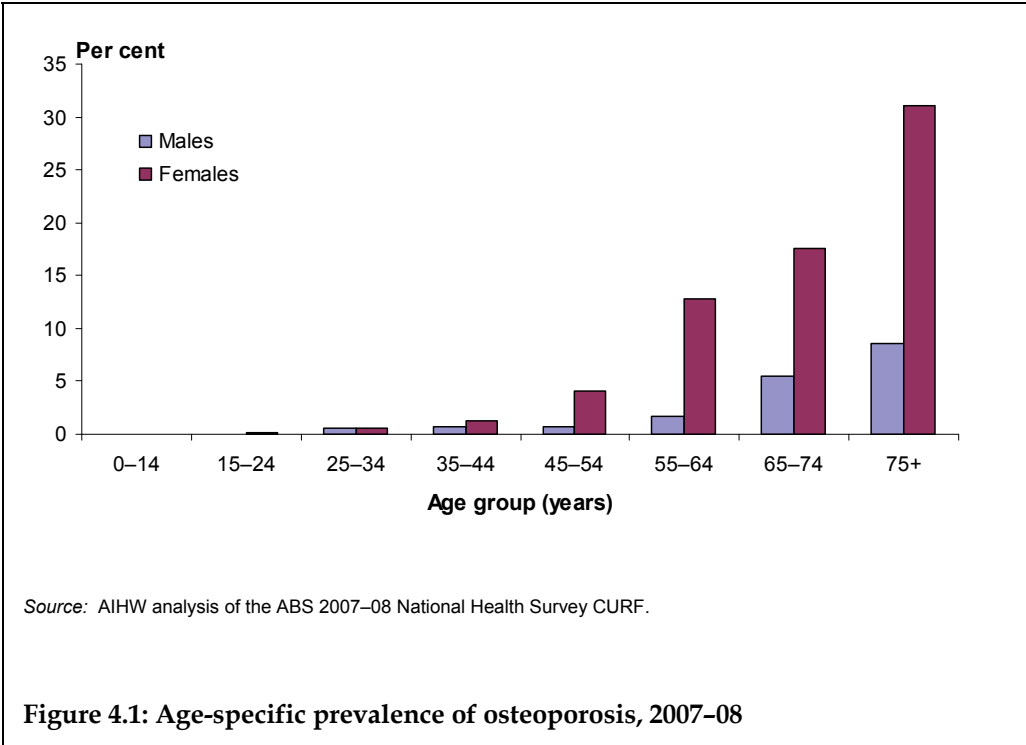
# 4 Health service use for osteoporosis

Often referred to as a silent disease, osteoporosis is a metabolic disease with generally no overt symptoms. The focus of osteoporosis management can be on minimising bone loss, largely a preventative strategy. Considerable health service use is required to treat and manage fractures and other consequences of osteoporosis.

The focus of this chapter is on the use of health services both to prevent osteoporosis and manage its complications.

## Prevalence of osteoporosis

An estimated 692,300 Australians had osteoporosis in 2007–08, almost 82% of which were females. More than 95% of the people with osteoporosis were aged 45 years and over (Figure 4.1). The prevalence was much higher among females, particularly those aged 75 years or over.



There are concerns about the estimated prevalence of osteoporosis in Australia based on the NHS (Access Economics 2010). It has been suggested that the NHS underestimates the exact prevalence of the condition. This is because the NHS data capture doctor-diagnosed cases of osteoporosis but leave out the undiagnosed cases. Osteoporosis has no outward symptoms, and people often do not know that they have the condition until they sustain a fracture and come to medical attention.

## Prevention and management strategies

Osteoporosis is largely a preventable disease. Both primary and secondary prevention are central to any strategy to manage osteoporosis. These include getting enough calcium and vitamin D, keeping physically active, maintaining a healthy weight, and not smoking. Avoiding falls, preventing fractures and prompt treatment of fractures also constitute an important component of this strategy (Sinaki 2004).

The presence of osteoporosis is suspected after the person has sustained a fracture following minimal trauma (AIHW 2008a, b). Such fractures are a hallmark of osteoporosis. The diagnosis is generally confirmed using bone mineral density (BMD) testing (see Box 4.1).

### Box 4.1 Bone mineral density testing

Bone mineral density (BMD) test, commonly referred to as DXA or DEXA, measures the presence and severity of osteoporosis. Considered as the 'gold standard' for diagnosing osteoporosis, the test is covered by the Medicare Benefits Schedule (MBS) for patients who:

- already have proven low BMD
- are considered to be at high risk because they have had a fracture after minimal trauma
- suffer from a condition that is associated with low BMD such as chronic liver disease
- are on a course of treatment that may cause low BMD.

DEXA scan is recommended to be repeated every 2 years to monitor the status of bone mass or to assess the effects of treatment (RACGP 2010).

Established osteoporosis is usually managed with medicines. Bisphosphonates, such as alendronate and residronate, are considered safe and effective agents for the treatment and prevention of osteoporosis (AIHW 2008a). They help stem bone loss and reduce the risk of fractures in people with established osteoporosis.

Hormone replacement therapy (HRT) can increase bone mineral density (BMD) and decrease the risk of fractures in post menopausal women (Cauley et al. 2003). Due to the risk of HRT in relation to breast cancer and cardiovascular disease, the long-term use of HRT is not recommended (NHMRC 2005).

Calcium is an essential nutrient for the prevention and treatment of osteoporosis. Calcium and vitamin D supplements have been shown to reduce non-vertebral fractures by up to 40% in elderly people (Reginster 1995).

An important aspect of the management of osteoporosis is early treatment of fractures. Prompt management of fractures, in particular hip fractures, is highly emphasised. This includes appropriate follow-up, investigation of the causes of the fracture in people who have not previously been diagnosed with osteoporosis, and initiation of osteoporosis treatment if necessary.

Treatment for a fracture may be received in GP surgeries, clinics, and hospitals (either in the emergency department or as an admitted patient). Following internal fixation, the patients need to be mobilised and rehabilitated (Solomon et al. 2005). Physiotherapists and occupational therapists provide valuable advice about how to reduce load on the bones by using walking aids. Gait training is also helpful in people with muscle weakness or poor balance to avoid falls (Eng & Tang 2007).



## General practitioners and specialists

Visits to GPs in relation to osteoporosis are for ongoing management of the problem, often in collaboration with a specialist. People may be prescribed appropriate medications, or advised diet and exercise. The GPs may refer people with osteoporosis to specialists, in particular endocrinologists.

### Self-reported consultations

An estimated 60,000 males and 223,100 females aged 15 years and over had consulted a GP or a specialist for their osteoporosis in the 12 months prior to the 2007–08 NHS (Table 4.1). The proportion of people with osteoporosis who visited a GP and/or specialist during the 12-month period did not differ much for males (39% males) and females (38%).

**Table 4.1: Visits to GPs or specialists for osteoporosis 2007–08**

| Sex     | People with osteoporosis |          |
|---------|--------------------------|----------|
|         | Number ('000)            | Per cent |
| Males   | 59.9                     | 39.2     |
| Females | 223.1                    | 38.2     |

#### Notes

1. Doctor-diagnosed cases, ages 15 years and over (N=692,300).
2. Visits to GPs or specialists in the 12 months prior to the survey.
3. Rates (in per cent) are age-standardised to the Australian population as at 30 June 2001. The age standardised rates are different to the crude rates as the population with specific conditions has a different age structure to the 2001 population.

Source: AIHW analysis of the ABS 2007–08 National Health Survey CURF.

Almost one-third of people with osteoporosis reported visiting a GP or a specialist at least once a month for their osteoporosis (Table 4.2). Another 28% had these consultations once every quarter. On average, people with osteoporosis reported consulting their GP/specialist more than 6 times over a 12-month period.

**Table 4.2: Frequency of visits to GPs or specialists for osteoporosis, 2007–08**

| Sex                   | People with osteoporosis |          |
|-----------------------|--------------------------|----------|
|                       | Number ('000)            | Per cent |
| At least once a month | 225.4                    | 32.6     |
| Every 3 months        | 194.6                    | 28.1     |
| Every 6 months        | 111.8                    | 16.1     |
| Annually              | 66.9                     | 9.7      |
| Other                 | 93.6                     | 13.5     |
| Total                 | 692.3                    | 100.0    |

Note: Doctor-diagnosed cases, ages 15 years and over.

Source: AIHW analysis of the ABS 2007–08 National Health Survey CURF.

## GP reported visits

The BEACH survey indicates that osteoporosis was managed at a rate of 0.9 per 100 encounters by GPs in 2008–09 (Britt et al. 2009). This equates to around 1 million Medicare-paid consultations across Australia that year.

## Allied health professionals

Allied health professionals contribute to the management of osteoporosis mostly following fractures (AIHW 2008a). Chiropractors, podiatrists, physiotherapists and hydrotherapists may be consulted by people with osteoporosis of their own accord or on a clinician's recommendation.

Almost 12% of people with osteoporosis reported seeking help from an allied health professional in the 12 months prior to the 2007–08 NHS.

## In-hospital physical therapy

People with osteoporosis hospitalised following minimal trauma fractures may receive support from a variety of allied health professionals in the hospital itself. In almost 1 out of 5 hospitalisations, physical therapy was provided following osteoporotic fractures (Table 4.3).

**Table 4.3: In-hospital physical therapy and other allied health support following osteoporotic fractures, 2008–09**

| Type of support      | Osteoporosis as an additional diagnosis |          |
|----------------------|---|----------|
|                      | Number                                  | Per cent |
| Physiotherapy        | 38,939                                  | 19.3     |
| Occupational therapy | 19,973                                  | 9.9      |
| Social work          | 11,496                                  | 5.7      |
| Dietetics            | 8,326                                   | 4.1      |

### Notes

1. Per cent of total surgical procedures (N= 201,479) performed for the condition.
2. Procedures have been counted only once for each hospitalisation, although those may have been performed more than once during that particular hospital stay.
3. People aged 55 years and over.

Source: AIHW National Hospital Morbidity Database.

## Referrals to specialists and pathology tests

Specialists usually consulted for osteoporosis include endocrinologists and rheumatologists. According to the 2008–09 BEACH survey, GPs referred the problem at a rate of 3.1 referrals per 100 osteoporosis problems managed, three-quarters of which were to specialists, usually to endocrinologists and rheumatologists (Table 4.4).

The most common pathology tests ordered by GPs for osteoporosis were for vitamin D and calcium levels.

**Table 4.4: Management provided by general practitioners for osteoporosis, 2008–09**

| Type of management                  | Problems managed |                                       |
|-------------------------------------|------------------|---------------------------------------|
|                                     | Number           | Rate per 100 problems managed (n=888) |
| Medications                         | 738              | 83.1                                  |
| Referrals                           | 28               | 3.1                                   |
| <i>Specialists (all)</i>            | 20               | 2.3                                   |
| <i>Endocrinologist</i>              | 9                | 1.1                                   |
| <i>Rheumatologist</i>               | 8                | 1.0                                   |
| <i>Allied health services (all)</i> | 7                | 0.8                                   |
| <i>Physiotherapist</i>              | 9                | 1.1                                   |
| Pathology                           | 134              | 15.1                                  |
| <i>Calcium/phosphate/magnesium</i>  | 82               | 9.2                                   |
| Imaging                             | 148              | 16.7                                  |
| BMD testing                         | 114              | 12.8                                  |
| Plain X-ray                         | 30               | 3.4                                   |

Source: AIHW analysis of the 2008–09 BEACH data collected by the Australian General Practice Statistics and Classification Centre, University of Sydney, in collaboration with the AIHW.

## Bone mineral density testing

An estimated 356,000 people (51.5% of people with osteoporosis) reported undertaking a BMD test in the 2 years prior to the 2007–08 NHS (Table 4.5). Females were more likely to have taken the test than males.

**Table 4.5: Bone mineral density (BMD) testing reported by people with osteoporosis, 2007–08**

| Action taken                   | Males       |          | Females     |          | People      |          |
|--------------------------------|-------------|----------|-------------|----------|-------------|----------|
|                                | Number '000 | Per cent | Number '000 | Per cent | Number '000 | Per cent |
| Bone density tested            | 74.4        | 59.5     | 436.0       | 76.8     | 510.4       | 73.7     |
| - <i>In last 2 years</i>       | 55.9        | 44.7     | 300.7       | 52.9     | 356.6       | 51.5     |
| - <i>More than 2 years ago</i> | 18.6        | 14.9     | 135.3       | 23.8     | 153.8       | 22.2     |
| Bone density not tested        | 50.7        | 40.5     | 131.9       | 23.2     | 182.6       | 26.3     |

Note: Doctor-diagnosed people, ages 15 years and over.

Source: AIHW analysis of the ABS 2007–08 National Health Survey CURF.

The 2008–09 BEACH data suggest that BMD testing was requested by GPs at a rate of 12.8 per 100 osteoporosis problems managed (Table 4.4).

## Medicine use

According to the BEACH survey, in 2008–09, medications were prescribed, supplied, or advised by GPs at a rate of 83.1 per 100 osteoporosis problems managed. These medications were mostly for stemming bone loss. Bisphosphonates, in particular, alendronate and risidronates accounted for the largest proportion of medications prescribed, supplied, or advised (Table 4.6). Calcium and vitamin D, as well as pain relief medicines, were also prescribed.

**Table 4.6: Top 10 medicines prescribed, supplied, or advised by GPs for osteoporosis, 2008–09**

| Type of medicine                    | Medicines prescribed/advised/supplied |                                       |
|-------------------------------------|---------------------------------------|---------------------------------------|
|                                     | Number                                | Rate per 100 problems managed (n=888) |
| Alendronate                         | 170                                   | 19.1                                  |
| Alendronate/cholecalciferol         | 94                                    | 10.6                                  |
| Risedronate sodium/calcarb          | 69                                    | 7.8                                   |
| Risedronate sodium                  | 61                                    | 6.9                                   |
| Calcium carbonate                   | 51                                    | 5.7                                   |
| Raloxifene                          | 27                                    | 3.0                                   |
| Calcium carbonate/vitamin D         | 22                                    | 2.5                                   |
| Ergocalciferol (vitamin D analogue) | 20                                    | 2.7                                   |
| Paracetamol                         | 16                                    | 1.8                                   |
| Oxycodone                           | 11                                    | 1.2                                   |

*Source:* AIHW analysis of the 2008–09 BEACH data, collected by the Australian General Practice Statistics and Classification Centre, University of Sydney, in collaboration with the AIHW.

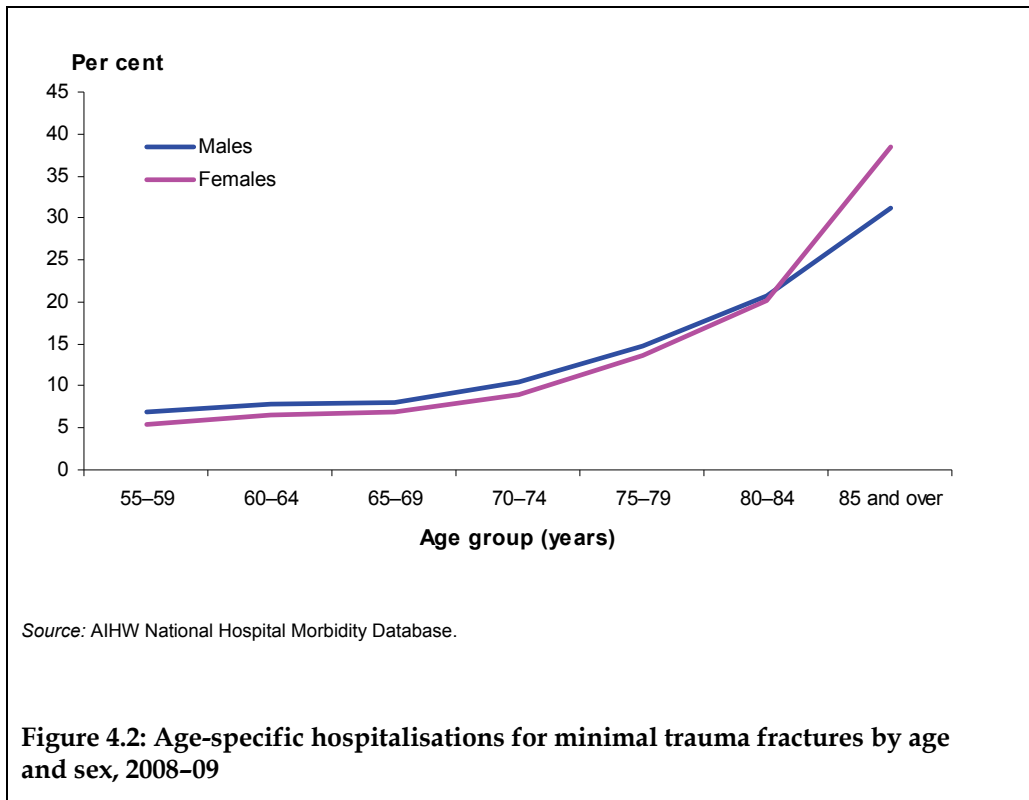
## Complementary medicines and dietary supplements

Complementary medicines and dietary supplements are reportedly commonly used in the management of osteoporosis. No details about complementary medicines for managing osteoporosis are available from the BEACH survey; however, the 2007–08 NHS collected some information about the use of complementary medicines and dietary supplements.

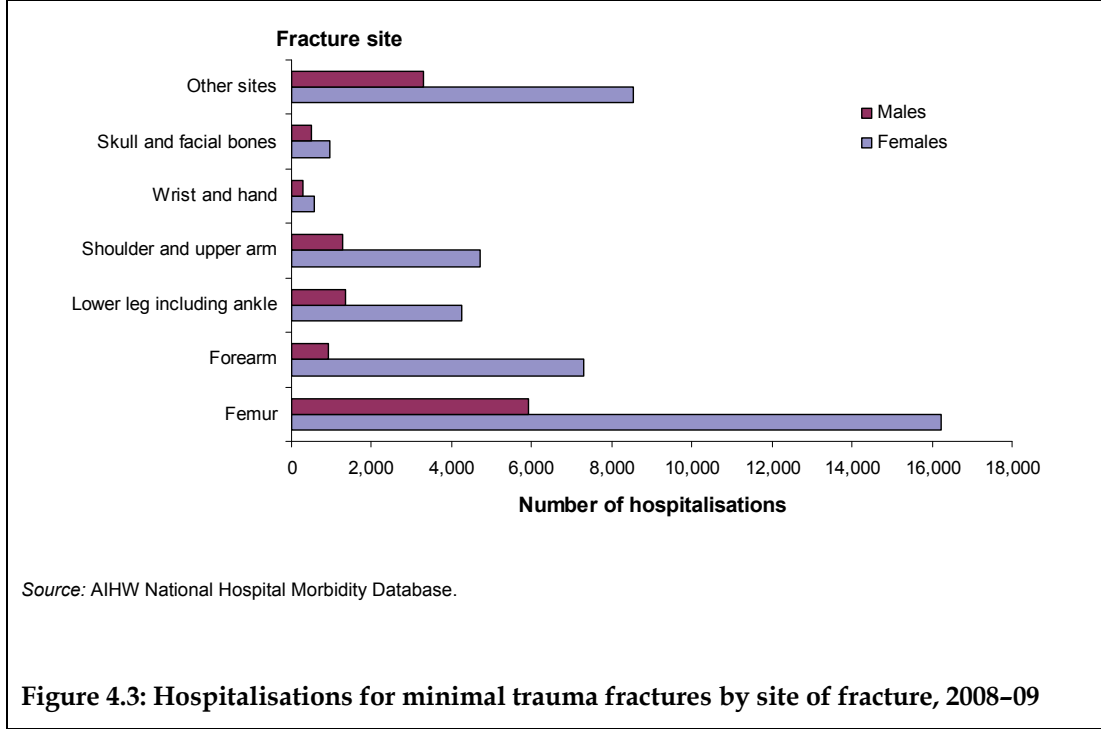
An estimated 305,600 Australians reported that they had used complementary medicines and supplements for their osteoporosis in the 12 months prior to the 2007–08 NHS. The commonly reported complementary medicines were calcium (62.7%), glucosamine (24.9%) and vitamin D (21.8%). Their use was more common in females than in males.

## Hospital use for minimal trauma fractures

There were 56,095 hospitalisations for minimal trauma or osteoporotic fractures of people aged 55 years and over in 2008–09. Minimal trauma fractures requiring hospitalisation vary with age and somewhat by sex (Figure 4.2). More than half of the people hospitalised for osteoporotic fractures were aged 80 years and over; three-quarters of those were females.



Hip fracture (fracture of the neck of the femur) was the most common reason for hospitalisation in 2008-09, followed in descending order by fractures of the forearm, shoulder and upper arm following minimal trauma (Figure 4.3). Hip fractures accounted for almost 39% of all minimal trauma fracture-related hospitalisation of people aged 55 years and over. The proportion increased to close to 54% among those aged 80 years and over.



## 5 Discussion

This report compared the use of health services for the most common varieties of arthritis (osteoarthritis and rheumatoid arthritis) and osteoporosis. The management of arthritis and osteoporosis generally comprises a combination of medication, physical therapy, self-management, education and (where necessary) surgery. However, as the conditions differ in their natural history, the extent and type of health services required also vary considerably.

Although general practitioners (GPs) are often the first point of contact for the diagnosis and management of these conditions, the use of GP services differed between the conditions. Self-reported data from the National Health Survey (NHS) suggest that more people with osteoarthritis consulted a GP in the 12 months prior to the 2007–08 survey. The proportion was higher among females with osteoarthritis and males with rheumatoid arthritis.

The strategies used by GPs varied. Medications, prescribed, advised or supplied by GPs were the most common management strategy for all the three conditions. Unlike osteoarthritis and osteoporosis, pathology tests were used commonly for the diagnosis and treatment of rheumatoid arthritis. Referrals were also common in people with osteoarthritis and rheumatoid arthritis, although referrals to specialists differed – the bulk of referrals for osteoarthritis were to an orthopaedic surgeon, while those for rheumatoid arthritis were to a rheumatologist.

The latest advancement in the treatment of arthritis is the use of surgical intervention. The procedure more commonly known as joint replacement or ‘arthroplasty’ was found to be most common. Almost 48,000 arthroplasties were performed in 2008–09 for arthritis, accounting for 18% of all surgical procedures for the condition.

In 2008–09, about 102,000 surgical procedures were performed for osteoarthritis and 3,600 for rheumatoid arthritis. Knee and hip replacements were the most common procedures performed for osteoarthritis (27% and 19% respectively of all procedures for osteoarthritis), whereas knee replacement (9%) and arthrodesis (fusing together the bones within a joint) (4%) were the most common procedures performed for rheumatoid arthritis.

For osteoporosis on the other hand, surgery is useful in the treatment of fractures mainly involving surgical realignment and fixation of the fractured bone.

Many people with osteoarthritis, rheumatoid arthritis and osteoporosis take dietary supplements or complementary medicines with their prescription medication, though evidence for their effectiveness is limited (Vitetta et al. 2008). According to the NHS, glucosamine and omega -3 fish oils were commonly used by people with osteoarthritis and rheumatoid arthritis. People with osteoporosis mainly took calcium and vitamin D supplements followed by glucosamine.

# Appendix: Data sources and methods

## Data sources

Three different data sources were used for the analysis presented in this report:

- National Health Survey (NHS)
- Bettering the Evaluation and Care of Health (BEACH) survey of general practice
- AIHW National Hospital Morbidity Database.

### National Health Survey

The National Health Survey (NHS), conducted every 3 years by the Australian Bureau of Statistics (ABS), is designed to obtain national information about the health of Australians, their use of health services and facilities, and health-related aspects of their lifestyle (ABS 2009a). The most recent survey was conducted in 2007–08, with previous surveys conducted in 2004–05, 2001, 1995, 1989–90, 1983 and 1977. The NHS is a community-based survey; it does not collect information from people living in nursing homes or those otherwise institutionalised.

The 2007–08 NHS included self-reports of doctor-diagnosed osteoarthritis, rheumatoid arthritis and osteoporosis. The survey also collected information about health service and medicine use, and any other health-related action taken to manage these conditions.

### Bettering the Evaluation and Care of Health surveys

The Bettering the Evaluation and Care of Health (BEACH) survey of general practice is an ongoing survey looking at the clinical activities of general practitioners (GPs). The survey is conducted by the Australian General Practice Statistics and Classification Centre (an AIHW collaborating unit) of the University of Sydney. The BEACH survey began in April 1998 and involves an ever-changing random sample of approximately 1,000 GPs every year, collecting information on about 100,000 GP-patient encounters (Britt et al. 2009). Data collected include patient reasons for encounter, problems managed, referrals, diagnostic tests, and pharmacological and non-pharmacological treatments provided.

At the time of writing, the latest BEACH data available were for the period 2008–09.

### AIHW National Hospital Morbidity Database

The AIHW National Hospital Morbidity Database contains information about episodes of care for patients admitted to hospitals in Australia. The data are supplied to the AIHW by state and territory health authorities and the Department of Veterans' Affairs. The database includes data on sex, age, indigenous status, area of usual residence, diagnoses, and various surgical and non-surgical procedures (AIHW 2010c). Diagnoses and procedures are currently coded using the International Statistical Classification of Diseases and Related Health Problems, Australian Modification, 10th revision (ICD-10-AM). The database covers almost all hospitals in Australia including public, private, psychiatric and day hospital facilities.

Patient-level information cannot be derived from this collection as the database is episode-based.

At the time of writing, the latest information available in this database was for the period 2008–09.

## **Age standardisation**

Age-standardisation is a procedure by which adjustments are made to summary statistics, such as disease prevalence or health service use rates, to account for differences in the age structures of populations under comparison. The procedure may also be used to compare summary statistics of the same population at different time periods. It involves applying the age distribution of a reference population to the populations under study to rescale age-specific rates.

It must be remembered, however, that age-standardised rates have no heuristic value, and should not be used in presenting summary statistics other than for inter-group (population group or medical condition) comparisons or in trend analysis.

In this report, only direct age-standardisation was used. In this procedure, the age distribution of the population in question is set equal to that of a reference population and the age-specific rates are rescaled. The resulting rates would be comparable to the rates for other populations fitted to the same reference age distribution. The Australian population in 2001 was used as the reference population.



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