

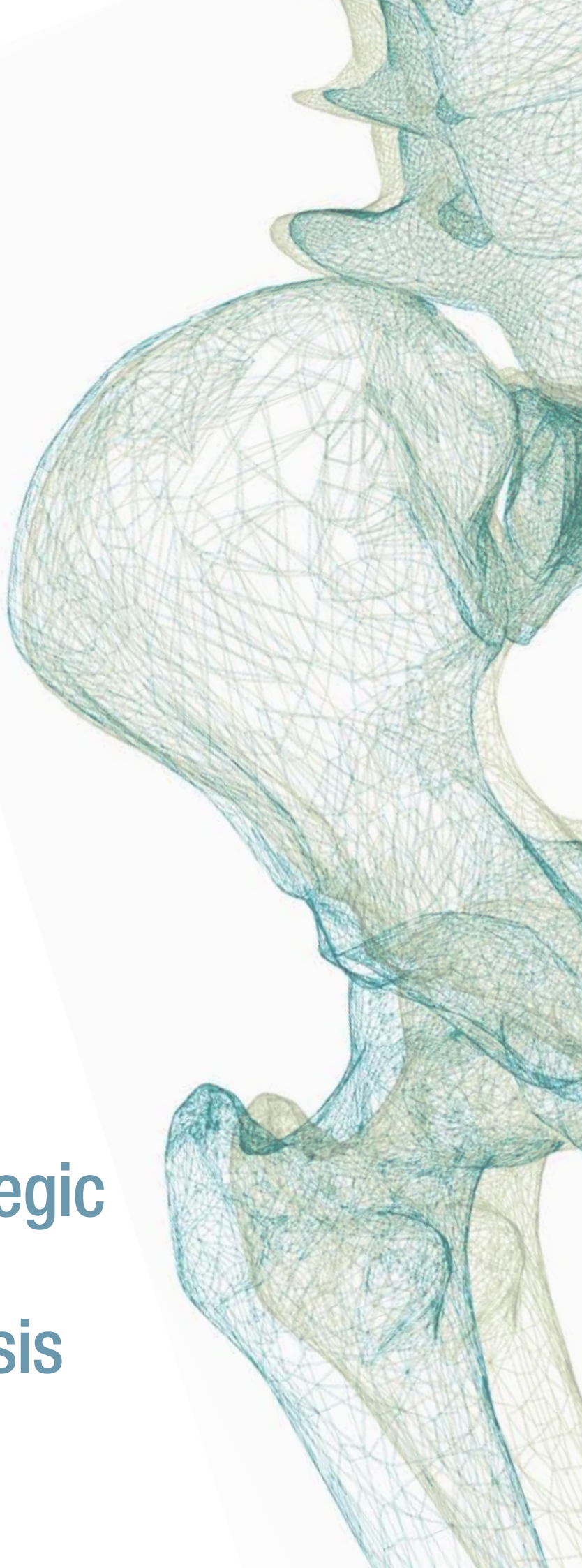


**Australian Government**

**Department of Health**

# **National Strategic Action Plan for Osteoporosis**

**2019**



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- 
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- 
- The members of the **National Osteoporosis Action Plan Working Committee** who provided further valuable input and time in progressing these identified priorities and actions as well as participating in a Workshop held in December 2018 to finalise these for the Action Plan (Appendix A).
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- The members of **Osteoporosis Australia's Medical and Scientific Committee** for their ongoing advice and support (Appendix B).
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# Overview

## Vision: Strong Bones for a Life without Fracture

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### Priority Areas:

- 1 Awareness and education with a focus on prevention
  - 2 Improved diagnosis, management and care
  - 3 Data collection, monitoring and strategic research
- 

The National Strategic Action Plan for Osteoporosis (this Plan) is the overarching plan moving forward to address the urgent need for a national strategic response to the increasingly complex challenges and burden of osteoporosis across Australia.

Osteoporosis is a chronic disease where a person's bones become fragile, leading to an increased risk of fractures. Living with osteoporosis can have an extreme impact on the quality of life and on health in general including ongoing pain, reduced mobility, disability and loss of independence.

In 2018, more than 1.2 million Australians were estimated as having osteoporosis<sup>1</sup> costing Australia's broader health care system over \$3 billion in total with over \$2.1 billion in direct fracture costs per year.<sup>2</sup>

Despite the personal and economic burden osteoporosis and fractures have on society, it remains a largely undiagnosed and under-treated disease. There are a variety of reasons for the low rates of diagnosis and management of osteoporosis in Australia including limited awareness around risks of osteoporosis by health professionals and amongst the general public,

operational silos across the healthcare system and a lack of focus on osteoporosis compared to other chronic diseases. There is a major mismatch between the burden of disease associated with osteoporosis and its prioritisation in policy and resourcing which must be addressed.

This Plan sets out the priorities, objectives and actions for addressing Australia's growing challenge of osteoporosis and provides an evidence-based road map to guide national efforts for implementation across the coming years to:

- broaden Australians awareness and understanding on the importance of bone health throughout their life course;
- improve the diagnosis, prevention, management and care of people "at risk" and with osteoporosis;
- improve the quality of life and outcomes for Australians living with osteopenia and osteoporosis;
- reduce the prevalence and incidence of osteoporosis and associated fragility fractures; and
- reduce the impact and cost of osteoporosis on individuals, their careers and family, society and the broader Australian healthcare system.



# Priority Areas and Objectives

## Priority Area 1: Awareness and education with a focus on prevention



- 1.1 Increase community awareness and understanding of the importance of bone health and osteoporosis including its risk factors and prevention.
- 1.2 Establish systems to deliver online national school education programs on the importance of bone health and early prevention of osteoporosis.
- 1.3 Improve health professional access to osteoporosis education and resources.

## Priority Area 2: Improved diagnosis, management and care



- 2.1 Enhance and expand prevention of secondary fracture by integrating a best practice Fracture Liaison Service (FLS) model of care across the majority of hospitals in Australia.
- 2.2 Pilot an integrated national approach for secondary fracture prevention with primary care.
- 1.3 Pilot a National Osteoporosis Risk and Identification Program targeting Australians over 70 years old.

## Priority Area 3: Data collection, monitoring and strategic research



- 3.1 Develop or enhance an integrated decision support and management platform (clinical platform) to enable better GP and other health professional patient interactions in both hospital and primary care settings.
- 3.2 Develop data collection processes and technical capabilities to integrate a clinical platform with existing Electronic Management Records (EMR) systems in both hospitals and primary care settings.
- 1.3 Drive strategic priority research supporting translation and implementation research to improve patient care and outcomes.

(The three Priority Areas are clearly interconnected and will require coordinated action during the Plan's implementation. Specific actions for each of the Priority Objectives are detailed on pages 10-29)

# About this Action Plan

This Action Plan has been developed through extensive and ongoing collaboration with members of the National Osteoporosis Action Plan Stakeholder Group and Working Committee (Appendix A) representing key individuals and stakeholder groups across Australia in osteoporosis prevention, management and care and those living with osteoporosis. Targeted consultations were also held with consumers, clinicians, health professionals, policy makers and health service providers to inform its development and broader public consultation was achieved using an online Survey. Information on the national consultation program, a summary of the evidence supporting the Plan and an overview of current osteoporosis related activities across Australia are provided separately.

This Plan builds on the Osteoporosis National Action Plan which was published by Osteoporosis

Australia in 2016. It aligns closely with and supports the goals, principles and strategic priority areas of the 2017 Australian Health Ministers Advisory Council's *National Strategic Framework for Chronic Conditions*<sup>3</sup> through a shared emphasis on prevention and efficient, effective and appropriate person-centred care to optimise quality of life for people with chronic conditions.

The intended audiences for this Action Plan include the Australian and state and territory governments, health services and aged care providers, clinicians and health professionals, consumers, researchers and other funders. Its implementation will require national action and the forming of ongoing effective partnerships across all levels and sectors of Australia's healthcare system including the public, private, non-government and research sectors.

## Principles

Development of this Plan has been underpinned by eight guiding principles in line with the *National Strategic Framework for Chronic Conditions*:

- Equity
- Collaboration and partnerships
- Access
- Evidence-based
- Person-centred approaches
- Sustainability
- Accountability and transparency
- Shared responsibility.

## Enablers

In addition, in line with *National Strategic Framework for Chronic Conditions* to achieve this Action Plan's Vision and successful implementation, the following seven enablers are critical:

- Governance and leadership
- Health workforce
- Health literacy
- Research
- Technology
- Resources

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## Partnerships

The effective prevention and management of chronic conditions is strongly influenced by the contributions made by a wide range of partners. These partners include:

- individuals, carers and families
  - communities
  - all levels of government
  - non-government organisations
  - the public and private health sectors, including all health care providers and private health insurers
  - industry
  - researchers and academics.
- 

All partners have shared responsibility for health outcomes according to their role and capacity within the health care system. Greater cooperation between partners will lead to more successful individual and system outcomes. Actions included in this Plan are intended to guide partner investment in the prevention and management of osteoporosis and should be implemented collaboratively to achieve the best health outcomes.

The development of this Action Plan has recognised the current fiscally constrained environment and so should guide the Australian, state and territory governments in planning and directing funding in a cost-effective and sustainable way to improve the health of all Australians – specifically, to reduce the incidence and impact of osteoporosis. Governments will use the activities in this Plan to inform their prioritisation of effort. Actions will vary in each jurisdiction depending on available resources, current programs and local needs.



# The Challenge of Osteoporosis

Osteoporosis is a chronic disease that leads to an increased risk of fragility fractures for people living with the condition. With over 1.2 million Australians having been estimated as having osteoporosis many remain unaware of having osteoporosis until a fracture occurs and even after one or more fractures have occurred, up to 80% people still go undiagnosed and receive no treatment.<sup>4</sup> Due to population growth and ageing, without improvements in diagnosis and treatment of osteoporosis, the rate of fractures is estimated to double by 2030.<sup>5</sup>

Osteoporosis has been a National Health Priority Area in the area of muscular skeletal health since 2002. Its diagnosis, treatment and management are currently only funded nationally through the Medicare Benefits Schedule. MBS reimbursement is only available to people over the age of 70 years and/or those on certain medications or suffering select conditions including prolonged corticosteroid therapy, rheumatoid arthritis, hyperparathyroidism and chronic kidney or liver disease.

However, while osteoporosis is very commonly seen in the Australian primary health care setting, because it is a 'silent' disease with no pain until a fracture takes place, it remains under-diagnosed and under-treated.

The prevalence and risks of osteoporosis increases with age and it is estimated that more than 80% of the population over the age of 70 have osteoporosis or osteopenia (low bone mineral density indicating high risk for osteoporosis) in Australia.<sup>6</sup>

Furthermore, people with osteoporosis often have multi-morbidities including muscle weakness, cardiovascular diseases, hypertension, diabetes mellitus, metabolic syndrome and osteoarthritis. On average, a person with osteoporosis has three comorbid conditions, the presence of which contribute to worsening their bone health.

More than 50% of postmenopausal women and 30% of men over the age of 60 years will suffer at least one osteoporotic fragility fracture or minimal trauma fractures (MTF) during their remaining life time which leads to living with ongoing pain, reduced mobility, loss of function and associated loss of quality of life, and the real possibility of further fractures. Yet as many as 80% postmenopausal women and 90% of men go untreated despite having presented with a fragility fracture.<sup>7</sup>

Major fragility fractures such as hip and spine fractures can cause long-term pain, disability, institutionalisation and even death. Aboriginal Torres Strait Islander people have a substantially greater fracture risk than non-Indigenous Australians with Indigenous men 50% and women 26% more likely to experience a minimal trauma hip fracture compared to non-Indigenous men and women respectively.<sup>8</sup> They are also on average much younger at the time of fracture.

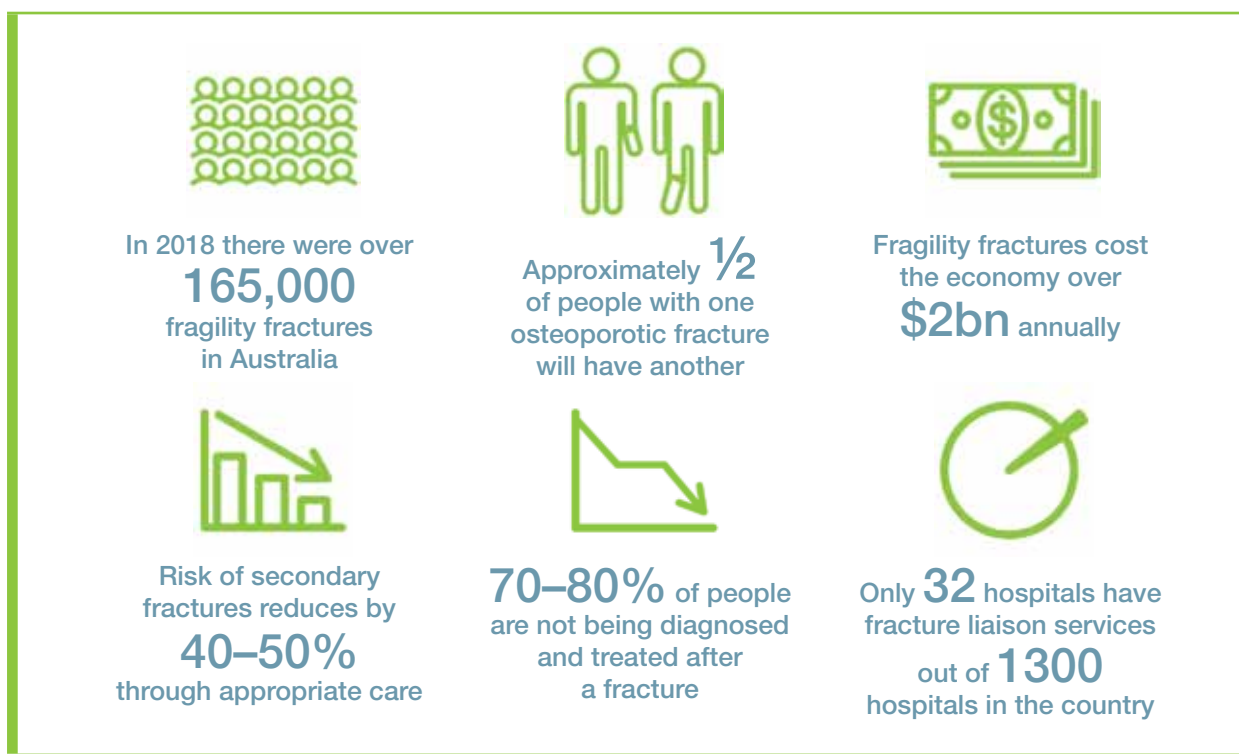
Every year over 165,000 hospital fragility fractures are recorded across Australia in people over the age of 50 years which leads to considerable costs to individuals, their families and the healthcare system.<sup>9</sup>

It has been estimated that there is one fracture due to poor bone health every 3.4 minutes costing the Australian healthcare system in excess of \$2.1 billion per year in direct costs including medical care such as hospital stays, surgery, emergency assistance, rehabilitation and community care (home care).<sup>10</sup> This personal and economic burden of osteoporosis will only increase with the ageing Australian population and by 2022 the cost of osteoporosis is projected to rise to \$3.84 billion.<sup>11</sup> Furthermore, the increase in demand for residential aged care after a hip fracture (about 2,700 aged care places in 2017) has been estimated to cost the Australian government around \$83 million in aged care subsidies.<sup>12</sup>

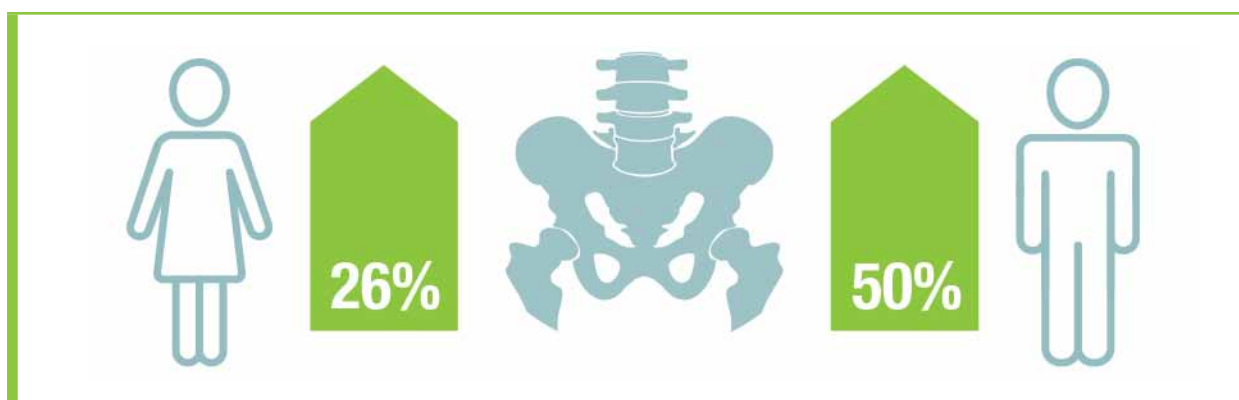
A significant proportion of MTFs could be avoided through appropriate osteoporosis diagnosis and management for people who have had a fragility fracture. The strongest and clinically most relevant predictor of a future fragility fracture is a previous fracture. About half of those who suffer a hip fracture had a previous fragility fracture and in general, a prior fragility fracture increases the risk of future fracture by two to three fold.<sup>13</sup>

Despite this burden osteoporosis and fractures have on society and Australia's broader health care system, osteoporosis remains a largely undertreated chronic disease. It is largely ignored in Australia, both in the primary and secondary care settings. Given the frequency of such fractures and the associated reduced life expectancy and loss of quality of life, there is an urgent need to better identify those with MTFs, and to better assess, manage and treat people with osteoporosis.

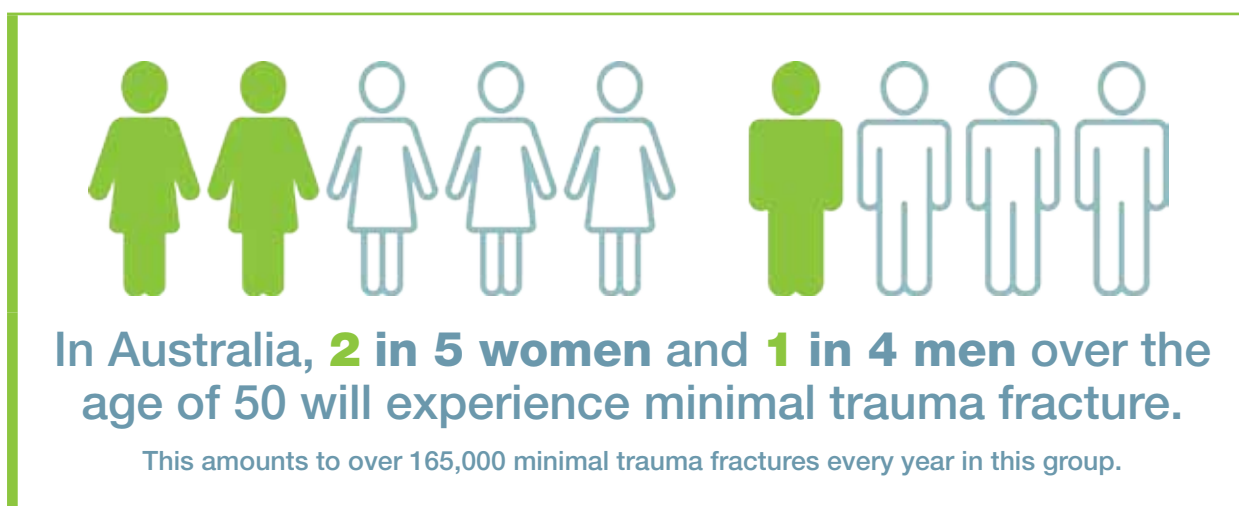
## The challenge of osteoporosis and associated fragility fractures in Australia



## Increased hip fracture risk in Aboriginal and Torres Strait Island people



## Estimated burden of osteoporosis and minimal trauma fractures



# Priority 1:

## Increase awareness and education with a focus on early prevention



### What we want to achieve:

- Increased community awareness and understanding of the importance of bone health and osteoporosis including its risk factors and prevention.
- Establishment of systems to deliver online national school education programs on the importance of bone health and early prevention of osteoporosis.
- Improved health professional access to osteoporosis education and resources.

### Why is this important?

Australians need to better understand the importance of bone health across their life course and the causes, risk factors and consequences of osteoporosis. It is not simply part of the ageing process and can lead to considerable long-term disability, pain and loss of independence. It also carries significant cost to the broader healthcare system. People need to know what they can do to improve their bone health throughout their lives and what services, information and support they can access when required.

Currently, there is limited broader community understanding in the importance of bone health and awareness of modifiable risk factors for osteoporosis. Bone plays a critical structural role in the body providing mobility, support and protection and is also an important storehouse for essential minerals. It is in a perpetual state of remodeling throughout life, with the entire skeleton being replaced every 10 years.<sup>14</sup>

As we age, men and women experience a reduction in hormone levels, leading to an imbalance in this bone rebuilding process and leaving bones thinner and more fragile. This is osteoporosis. Other factors can also impact on bone strength but the great concern with osteoporosis is the increased risk of fracture.

Moreover, bone conditions can impact anyone at any age, and men and women are both at risk. The possibility of sustaining a fracture increase

exponentially with age due to not only the progressive decrease in bone mass, but also due to the increased rates of falls among the elderly.

While fragility fractures are most common in people over the age of 50 years, they are not an inevitable part of growing old. A healthy lifestyle and bone-protecting treatments – prescribed when a person has been diagnosed with osteoporosis – can more than halve a person's risk of suffering a fragility fracture.<sup>15</sup> The causes of osteoporosis and its risk factors are now better understood and we know that healthy behaviours early in life and through adulthood can reduce your risk of contracting the condition. Healthy lifestyle choices, such as maintaining a diet with adequate protein, calcium, optimal vitamin D, and regular progressive weight-bearing exercise, can have a significant effect on bone health in later life.<sup>16</sup> Better treatments can also significantly improve quality of life.

Given that 90% of peak bone mass is acquired by age 18 years for girls and by age 20 years for boys, targeting adolescents before and during puberty by delivering strong evidenced-based messages about good bone health to secondary school children, could have a considerable impact on increasing peak bone mineral mass and maintenance of bone health, potentially delaying the onset of osteoporosis and decreasing the risk of fractures later in life.<sup>17</sup> It is recommended that Australia takes an education-based approach to

improving the bone health of children with the aim of instilling a range of behaviours that can be independently sustained through puberty and beyond. Targeted National School Education Programs on the importance of having healthy bones should be delivered supporting the current Science and Personal Development and Health curriculum as specified by the National Curriculum in the areas of skeletal science and bone health. Such programs should also be integrated with general health information on the links between risk factors and comorbidities with other chronic conditions.

The most common secondary cause of osteoporosis is the long-term use of corticosteroids and this type of medication is very widely used for the treatment of respiratory disease (asthma), musculoskeletal conditions (rheumatoid arthritis), inflammatory bowel disease and skin diseases.<sup>18</sup> One in five patients treated with corticosteroids has an osteoporotic fracture within the first 12 months of treatment and this proportion increases to 50% after 5–10 years.<sup>19</sup>

While a previous fracture is a very strong indicator, other risk factors include a family history of osteoporosis or fractures, low vitamin D levels, low intake of calcium, low body weight, physical inactivity, and smoking or excess alcohol consumption. Osteoporosis is also common in people with malabsorption disorders, such as coeliac disease and with certain hormonal disorders, including overactive thyroid or parathyroid, liver or kidney disease, early menopause or low testosterone.<sup>20</sup> It is also increasingly common in those with diabetes mellitus and hormonal treatments for breast and prostate cancer, antiepileptic drugs and HIV and its treatments can also lead to bone loss.<sup>21</sup>

Easy access to evidenced-based health messaging, current information and appropriate services and support is critical to better equip people with the knowledge and skills to understand potential risk factors, the importance of early diagnosis and to self-manage chronic health conditions such as osteoporosis. Importantly, this enables optimum patient-centered health care and contributes to informed decision making. Likewise, it is critical that health professionals are skilled and supported with current evidenced-based guidelines, training, tools and other resources so they are able to deliver the best osteoporosis care.

*Know Your Bones* is an Australian translational research initiative that has been developed by Osteoporosis Australia and the Garvan Institute of Medical Research for fracture prevention. In summary, it is an evidence-based, consumer online health tool that reviews risk factors for poor bone health by asking users a series of evidence-based questions under four broad areas:

- Medical History (including age, weight, previous fracture, previous falls, gender)
- Clinical Risk Factors
- Lifestyle Risk Factors
- Medication/supplement use.

Specifically, *Know Your Bones* identifies bone fracture risk by assessing the user's age, gender, history of fracture, bone mineral density, weight and history of falls. For people aged 50 years and over, risk of fracture (over 5 and 10 years) can be assessed and reported. This online assessment also investigates the users clinical and lifestyle risk factors as well as medication use of any age, and a summary report is produced with personalised recommendations for users to discuss with their GP.

# Objectives and Actions

## Objective 1.1

Increase community awareness and understanding of the importance of bone health and osteoporosis including its risk factors and prevention

Action	Detail
1.1.1 Deliver a broad range of targeted national osteoporosis and bone health public awareness campaigns and resources with consistent evidenced-based health messaging	Enable people to minimise the risks for osteoporosis with consistent evidenced-based health messaging on the benefits of good diet with fruit and vegetables, low salt, vitamin D, protein, calcium alcohol reduction, smoking cessation and regular physical exercise and integrating these messages as benefit for other chronic conditions.
	Health messaging to include addressing the misconceptions around appropriate treatment with medications to prevent bone deterioration, or restore bone health, with a balanced approach between effectiveness and safety to support patients in making informed decisions about the use of medication and the impact on their overall health.
	Education and awareness campaigns should be tailored for specific priority population groups including for the over 50s, Aboriginal and Torres Strait Islander people and people living in rural and remote areas with time taken to work with these groups to investigate and co-design the specific messages required for each group at a local level. Targeted campaigns for older Australian's living with osteoporosis and fractures in different settings including aged care facilities, nursing homes and senior groups should be focused on maintaining independence.
	Materials and campaigns need to be developed in a culturally appropriate way for Aboriginal and Torres Strait Islander people with recognition of cultural sensitivities, linguistically diverse backgrounds and literacy levels.
	The <i>Know Your Bones</i> online tool to become the foundation of risk assessment across all population groups including the general public.

Action	Detail
<p><b>1.1.2</b> Enhance and better promote <i>Know Your Bones</i><sup>36</sup> to engage the community to self-risk assess osteoporosis and/or fracture</p>	<p>Specific activities to enhance and better promote the <i>Know Your Bones</i> tool to the Australian community include:</p> <ul style="list-style-type: none"> <li>• expanding the national promotion of <i>Know Your Bones</i> by deploying multi-communication and marketing channels including print, digital, social media, rural and remote publications, aligned organisational electronic direct mailouts, seniors expos and special events;</li> <li>• generate and provide targeted content about <i>Know Your Bones</i> via public relations activity as well as via online and publications;</li> <li>• engage a suitable ambassador to help raise the profile of the <i>Know Your Bones</i> tool and encourage community engagement across target audiences and priority populations; and</li> <li>• closely work with key stakeholders including national health professional organisations and associations, relevant non-government organisations, health industry and research organisations to expand placement of online linkages to <i>Know Your Bones</i> tool from websites, health portals, health listings and consumer websites.</li> </ul> <p>In late 2018, Osteoporosis Australia produced the first <i>Know Your Bones Community Risk Report</i><sup>22</sup> reviewing de-identified self-reported data via the online self-assessment questionnaire.</p> <p>This Report, based on 41,809 completions provides a baseline of results against which future reports can be compared. Its' findings clearly demonstrate a gap in osteoporosis care across Australia. In particular it shows people who have sustained a 'minimal trauma fracture' are not routinely managed with treatment to reduce fracture risk and others with clinical risk factors are not routinely investigated with a bone density test.</p> <p>Follow up <i>Know Your Bones Community Risk Reports</i> will be produced and broadly disseminated to provide current updates on the status of bone health in Australia.</p>
<p><b>1.1.3</b> Include osteoporosis and improving bone health into relevant health care policies, programs and initiatives across State and Federal governments</p>	<p>Update existing or new chronic disease prevention and management policies, frameworks, programs and funding arrangements across all levels of government to explicitly include a focus on improving bone health and osteoporosis. Include osteoporosis health messaging in government-run campaigns and programs promoting physical activity, healthy diets, weight management and smoking cessation.</p> <p>Explicitly address osteoporosis in current government health policies and programs such as the Women's Health Strategy and the Health Care Homes Trial (Stage 1) where osteoporosis is included in the Predictive Risk Model (PRM) to determine patient eligibility for Health Care Home enrollment.</p>



## Objective 1.2

Establish systems to deliver national school online education programs on the importance of bone health and early prevention of osteoporosis

Action	Detail
<b>1.2.1 Phase 1</b> Develop and pilot 3–5 interactive bone health education modules for Years 7–8 across six public secondary schools	Determine a National Secondary School Stakeholder Engagement strategy to include the Department of Education and Training (DET), the Board of Studies in each State, the Australian Curriculum Assessment and Reporting Authority (ACARA), the National Catholic Education Commission, the Independent Schools Council of Australia and other professional secondary teaching bodies such as the Australian Science Teachers Association, the Australian Council for Health, Physical Education and Recreation (ACHPER) and the Association of Personal Development and Physical Education Teachers.
	Identify six public secondary high schools from two States (suggest NSW and SA) to pilot the developed interactive bone health education modules.
	Osteoporosis Australia to establish and lead a Secondary School Education Advisory Committee to include representatives from identified key stakeholder groups as well as teachers and parents from the six public secondary schools.
	Determine online technology and tender requirements for website, online module and other resource development that is both Microsoft, Android and Apple compatible.
	Contract a professional curriculum writer to develop education content in consultation with the Advisory Committee and teachers for the 3–5 bone health modules that are Years 7–8 curriculum compliant ensuring that all Key Learning Areas (KLAs) are covered.
	Phase 1 pilot to be conducted across the six public high schools over two School Terms to evaluate the online modules including content, ease of use, engagement (teacher, student and parent), classroom interaction and learning outcomes.
	As a result of Phase 1 evaluation process improvements and amendments implemented to Year 7–8 online bone health modules.

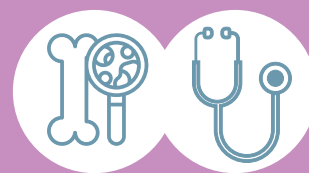
Action	Detail
<b>1.2.2 Phase 2</b> Develop and pilot 3–5 interactive bone health education modules for Years 9–10 across Phase 1’s identified public secondary high schools	Contract professional curriculum writer to develop education content in consultation with the Advisory Committee and teachers for the 3–5 bone health modules that are Years 9–10 curriculum compliant ensuring that all Key Learning Areas (KLAs) are covered.
	Phase 2 pilot to be conducted across the same six public secondary high schools over two School Terms to evaluate the online modules including content, ease of use, engagement (teacher, student and parent), classroom interaction and learning outcomes.
	As a result of the Phase 2 evaluation process improvements and amendments implemented to the Year 9–10 online bone health modules.
<b>1.2.3</b> Conduct program evaluation and determine next steps	In consultation with the Secondary School Education Advisory Committee, implementation of the improved Years 7–10 online bone health modules to an additional minimum 35 public secondary schools. Online bone education hub fully live for Years 7–10 secondary teachers, parents and students.
	An evaluation program to be designed and conducted for the extended cohort of secondary public schools over two School Terms to determine the effectiveness of taking a public secondary education-based approach to improving bone health in children (years 7–10) and recommendations moving forward including next steps for implementation and marketing campaigns nationally.

## Objective 1.3

## Improve health professional access to osteoporosis education and resources

Action	Detail
<b>1.3.1</b> Develop and promote access to self-management resources, education and training opportunities for practice nurse and allied health professionals including pharmacists, exercise physiologists and physiotherapists	Develop effective self-management resources for practice nurses and allied health professionals that provide people with osteoporosis with information and skills to enhance their ability to take an active role in their own health care, when appropriate diet, safe and effective exercise and adherence to pharmaceutical treatment if required. Self-management resources should include the ability to access a coordinated network of professionals for further information or treatment.
	Develop partnerships with relevant allied health professional associations and organisations to promote access to these new resources and education opportunities.
	In consultation with professional associations and organisations, develop and deliver national practice nurses and allied health training and education frameworks available in a variety of formats (e.g. face to face, online and blended learning) to optimise accessibility.
	Expand evidenced based content on OA health professional online education portal and promote availability and access.
<b>1.3.2</b> Enhance GP and PHN access to relevant training and education opportunities and bone health resources	Build on existing partnerships with relevant primary health care colleges and organisation including the RACGP to improve tactics and access to evidenced-based bone health and active self-management online resources including to <i>Know Your Bones</i> .
	Engage more broadly with national PHNs on osteoporosis education and training opportunities.

## Priority 2: Improve diagnosis, management and care



### What we want to achieve:

- Enhanced and expanded prevention of secondary fracture by integrating a best practice Fracture Liaison Service (FLS) model of care across the majority of hospitals in Australia.
- Piloting of an integrated national approach for secondary fracture prevention with primary care.
- Piloting of the National Osteoporosis Risk and Identification Program targeting Australians over 70 years old.

### Why is this important?

Despite the burden osteoporosis and fractures have on society and costs to Australia's health care system, osteoporosis remains an under-diagnosed and under-treated chronic disease. As many as 80% of patients do not receive appropriate investigation and treatment after a fracture. It is largely ignored in Australia, both in the primary and secondary care settings. Given the frequency of such fractures and the associated reduced life expectancy and loss of quality of life, there is an urgent need to better identify those with minor trauma fractures (MTFs) and to better assess, treat and manage people with osteoporosis.

Secondary fracture prevention is aimed at treating high-risk individuals who have already suffered an osteoporotic fracture. About 50% of those who suffer a hip fracture had a previous fragility fracture and in general, a prior fragility fracture increases the risk of future fracture by at least two to three fold.<sup>23</sup>

Secondary Fracture Prevention (SFP) Programs take a number of forms. One effective model is the use of hospital-based Fracture Liaison Services (FLS) and the impact of these in improving the number of patients receiving treatment after fracture (and reducing the likelihood of subsequent fracture) across Australia and internationally including New Zealand, Europe and North America has been well documented.<sup>24 25 26 27</sup>

The key elements of a FLS are to:<sup>28</sup>

- identify fracture patients (identification);
- conduct investigations to diagnose osteoporosis (investigation);
- assess future fracture risk (assessment); and
- where appropriate, to initiate treatment (treatment).

An FLS is a multidisciplinary team including specialists, nurses, and physiotherapists with a FLS coordinator who facilitates the identification and investigation of patients. There are four possible models of care for FLSs based on the levels of service and intervention provided.<sup>29</sup>

**Type A** – service identifies patients with MTF, investigates and initiates treatment and a management plan, provides education to patients and communicates with other stakeholders;

**Type B** – service identifies and investigates patients but refers patient back to the GP with recommendations for management and treatment initiation;

**Type C** – service identifies patients at risk and informs them and their GP who undertakes any assessment or treatment of patients; and

**Type D** – service identifies at-risk patients and informs and educates only with no communication with GPs.

National experts in bone health have invested considerably in establishing secondary fracture prevention services in Australia. However, at the time of writing this Plan there were only around 32 FLSs established nationally out of a potential 1300 hospitals across Australia.

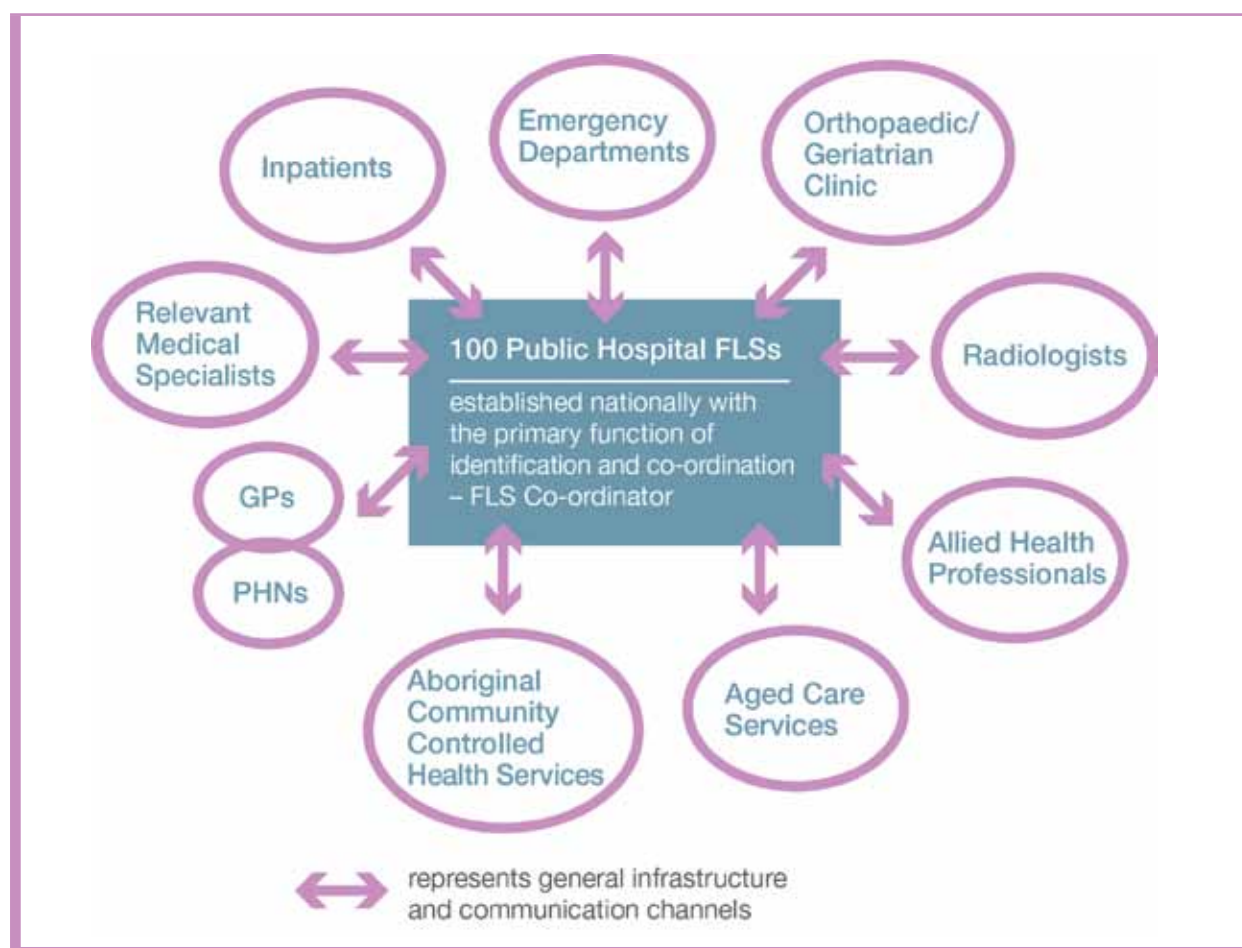
Almost all SFP Programs in Australia are based in hospitals. However, it is estimated that at least 60,000 fragility fractures per year do not present to hospitals limiting the number of people in the community who the hospital-based team can capture.<sup>30</sup>

GPs play critical role in SFP to reduce fracture and hospital re-admissions. As central primary care providers, GPs are able to manage osteoporosis with ability to diagnose and treat patients with fragility fractures. They are able to improve the identification, diagnosis and management of patients with previous osteoporotic fractures as

well as follow up on patients discharged from hospital-based FLSs ensuring compliance with management strategies. An integrated approach to SFP with primary and community care by incorporating the role of an FLS in Australian GP practices is therefore recommended.

Currently, although certain diagnostic and management services are already funded under the Medical Benefits Schedule (MBS) and Pharmaceutical Benefits Schedule (PBS) for at-risk individuals, there is a relatively poor uptake in eligible populations.<sup>31</sup> A National Risk Identification and Awareness Program targeted to “at risk” groups (particularly to women and men aged over 70 years) to increase osteopenia and osteoporosis awareness, risk factor identification, diagnosis and access to currently available subsidised services would help lead to improvements in early detection, management and health outcomes related to osteoporosis.

### An overview of a public hospital integrated FLS best practice model of care



# Objectives and Actions

## Objective 2.1

Enhance and expand secondary fracture prevention by integrating a best practice Fracture Liaison Service (FLS) model of care across the majority of public hospitals in Australia

Action	Detail
<b>2.1.1</b> In partnership with healthcare system stakeholders, OA to lead the implementation of 100 public hospital integrated FLSs across Australia	Identify and engage key health care system stakeholders for the national implementation of 100 public hospitals for integration with a FLS.
	<p>OA to lead the establishment of an Implementation Committee with appropriate State/Territory representation providing expertise and authority to guide local health services in integrating 100 hospital-based FLS services nationally. The responsibilities of this Committee include:</p> <ul style="list-style-type: none"> <li>• leadership, governance and oversight for the roll-out of the integrated FLSs;</li> <li>• development of agreed selection criteria and processes for identifying public metropolitan, regional and semi-rural hospital sites for integration with a FLS; and</li> <li>• leadership and guidance to new and established secondary fracture prevention programs.</li> </ul>
	<p>A key priority for the Committee is the development of a set of National FLS Minimum Standards for the 100 FLSs to guide the implementation and measurement of best practice, and promote consistency across services nationally. Although the specific FLS model for each of the 100 sites may vary depending on local needs and resources, they must be based around the four key elements: identification, investigation, informing and intervention.</p> <p>Recommended enhancements and improvements for the current and new 100 FLSs that must be reflected in the developed National FLS Minimum Standards include:<sup>32</sup></p> <ul style="list-style-type: none"> <li>• improving identification by developing and integrating of appropriate coding and technology to better identify MTFs at EDs;</li> <li>• patients referred to the FLS for investigation to include DXA BMD; absolute fracture risk will be estimated using either FRAX or the Garvan Fracture Risk Calculator (<i>Know Your Bones</i>); additional radiography; performance of baseline biochemistry and where needed performance of falls risk assessment;</li> <li>• appointing an FLS Coordinator to each site to be at least two full days per week or as appropriate for the workload of level of the public hospital;</li> <li>• interventions to be offered as part of FLS include physiotherapy and fall prevention programs, occupational therapy, dietary advice and pharmacotherapy;</li> <li>• development of communication and referral protocols for an efficient distribution of MTF patients from the ED to orthopaedic outpatient clinics and inpatient clinics for better initial investigation and management of osteoporosis;</li> <li>• allocation of a Nurse Coordinator at each site to work with orthopaedic surgeons, geriatricians and other allied health professionals to assist with identification of MTF cases;</li> <li>• allowance from local hospital authorities is required to initiate MTFs patients on appropriate pharmaceutical treatments within the hospital setting to reduce the chance of non-treatment;</li> <li>• development of protocols for follow-up letters to be provided for local GPs by the FLSs as their role is critical for ongoing management and ongoing review of identified MTF patients; and</li> <li>• better engagement of local PHNs to better educate GPs on relevant Bone Health awareness and role of hospital FLSs is critical.</li> </ul>



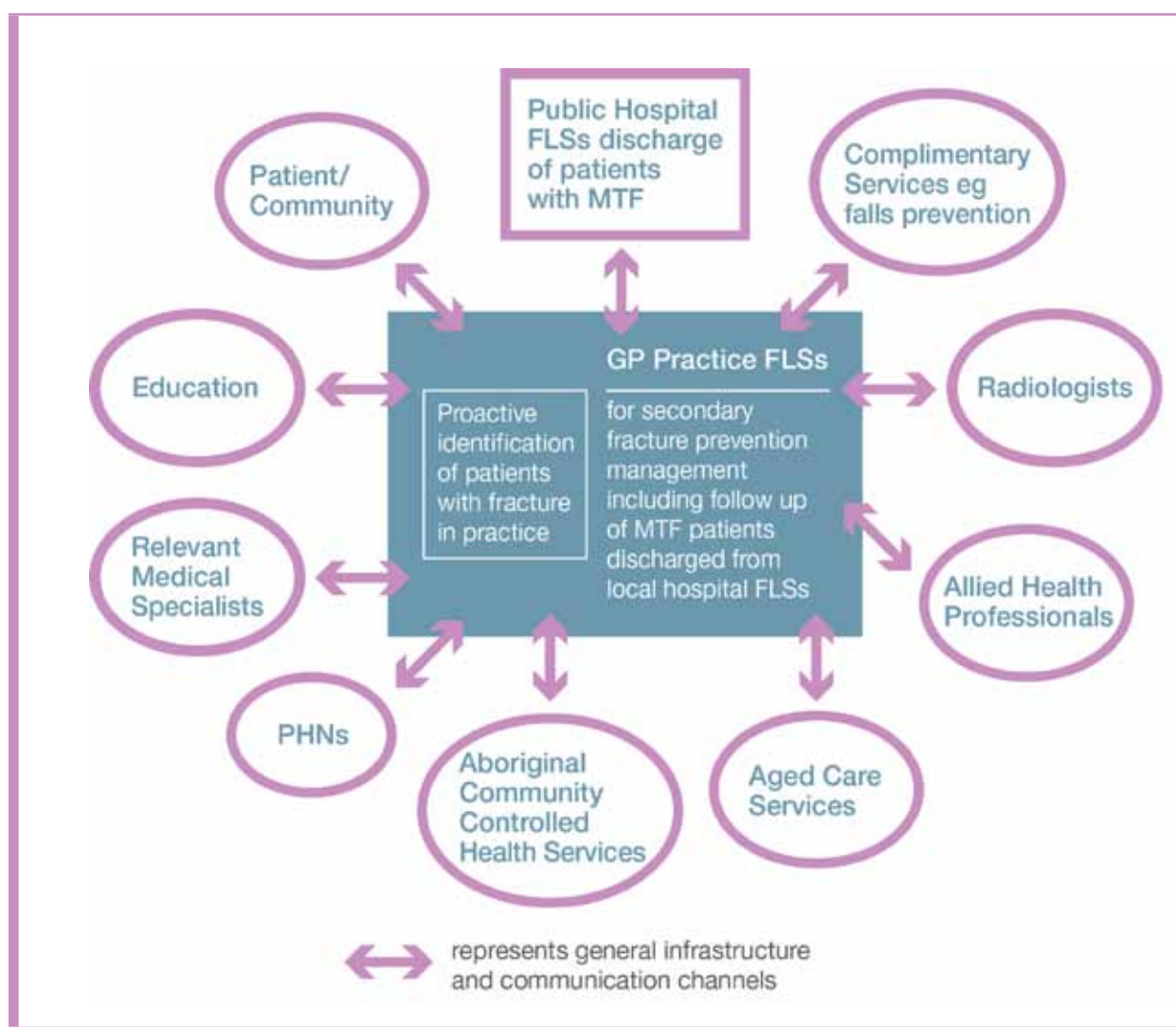
Action	Detail
<b>2.1.2</b> Establish 100 best practice integrated public hospital FLSs nationally	With guidance from the Implementation Committee each of the 100 (current and new) hospital sites to establish local hospital-based implementation teams to include representatives from the community and primary care sectors including linking with local GPs, medical specialists, aged care services, radiology and Aboriginal Community Controlled Health Care Service (ACCHCS) to co-design an integrated approach in establishing and implementing a best practice hospital site FLS meeting local needs and resources.
<b>2.1.3</b> Establish local data collection, monitoring and reporting systems including a national registry	<p>Develop and implement ongoing FLS data collection and monitoring systems of patient outcomes via appropriate technology at local hospital ED and outpatient clinics.</p> <p>Establishment of a National Secondary Fracture Prevention Registry would support the application of the National FLS Minimum Standards and provide a central location outcome data. The Implementation Advisory Committee would endorse agreed processes and minimum reporting requirements for sites to provide to the Registry. Data collected and entered into this Registry could be further utilised to enable ongoing development and continuous improvement of these services.</p>
<b>2.1.4</b> Develop and deliver FLS (and secondary fracture prevention) education and communication strategies	<p>Development of communication and education strategies supported by local LHDs, PHNs and the broader community (including local media) will help raise awareness around the value and need for secondary fracture prevention. Local FLSs will provide agreed messaging for health professionals and at-risk populations with strategies to specifically target:</p> <ul style="list-style-type: none"> <li>• patients to support literacy and participation (e.g. <i>Know Your Bones</i>);</li> <li>• GPs and allied health professionals to support ongoing management of osteoporosis; and</li> <li>• Aged care facilities and clinicians to consider BMD scanning for people residing in aged care.</li> </ul> <p>Establishment of a National Secondary Fracture Prevention Registry would support the application of the National FLS Minimum Standards and provide a central location outcome data. The Implementation Advisory Committee would endorse agreed processes and minimum reporting requirements for sites to provide to the Registry. Data collected and entered into this Registry could be further utilised to enable ongoing development and continuous improvement of these services.</p>

## Objective 2.2

## Pilot an integrated national approach to secondary fracture prevention with Primary Care

Action	Detail
<b>2.2.1</b> In partnership with health care system, OA to establish an Integrated FLS Primary Care Advisory Committee	<p>The Integrated FLS Primary Care Advisory Committee representing relevant stakeholders including from rural and remote settings will provide ongoing leadership, governance and expertise with its' responsibilities including:</p> <ul style="list-style-type: none"> <li>• endorsing a protocol for engaging and communicating with 200 GP practices;</li> <li>• engaging support from relevant PHNs to promote co-operation, sharing of information and best practices, educational support for GPs in area of bone health and potential support from local hospital FLSs infrastructure;</li> <li>• endorsing processes and guidelines (the Protocol) for establishing the role of FLS in the 200 GP practices including allocation of trained FLSs nursing personnel to practices to identify local cohorts of patients 65 years and over for bone health assessment; and</li> <li>• identify future improvement options and recommendations for this national approach to secondary fracture prevention moving forward.</li> </ul>
<b>2.2.2</b> Establish effective GP practice electronic decision support platforms	<p>Development, or enhancement of, existing electronic decision support (CDM management) platforms to register, assesses and guide GPs management options for people at risk of secondary fracture due to osteoporosis.</p> <p>The system will need to identify patients at risk and provide appropriate personalised GP management plans in line with current evidence including National RACGP Clinical Guidelines<sup>33</sup> and with risk stratification agreed to by the patient and GP allowing for long term monitoring of outcomes.</p>
<b>2.2.3</b> Integration of FLSs into selected GP practices to conduct local patient assessments	<p>The 200 GP practice integrated FLSs will be required to:</p> <ul style="list-style-type: none"> <li>• identify appropriate local cohorts of patients at risk or with fragility fracture;</li> <li>• coordinate an integrated team approach (including practice staff, GP, local PHN, diagnostic providers, and allied health professionals) to assess the patients in line with current evidence including RACGP Clinical Guidelines and support the process of patient assessment at GP practices;</li> <li>• integrate with and/or establishing required complimentary services, including fall prevention and life style education and management; and</li> <li>• integrate and co-ordinate required patient care with allied health professionals.</li> </ul>
<b>2.2.4</b> Conduct an evaluation of this integrated approach to secondary fracture prevention with primary care pilot	<p>Evaluation program to be designed and conducted by an expert team against patient outcome and process and technology parameters to determine impact, recommendations and next steps.</p>

## Proposed integrated approach to secondary fracture prevention with primary care



## Objective 2.3

Pilot the *National Osteoporosis Risk and Identification Program* targeting Australians over 70 years old

### National Osteoporosis Risk Identification and Awareness Program

#### The Challenge



In Australia osteoporosis is generally not diagnosed and treated even after a fragility fracture. Major fragility fractures require costly medical care.

It is estimated that **1.2 million** people have osteoporosis in Australia

There is a lack of public **awareness** around osteoporosis

In 2018 there were **165,000 osteoporotic fractures**

**80%** of women and **90%** of men do not receive appropriate treatment, despite having presented with a fragility fracture.

Osteoporotic fractures cost the Australian economy over **\$2 billion** in direct costs

Risk of fracture can be reduce by **50%** through appropriate care.

#### The Program



What will it look like?

**Targeting those 70+**

**Letters sent to target population** via a registry office (potential follow up calls)

**Targeting to occur** for those with

- Osteopenia every 2 years
- Normal BMD every 5 years

**Treatment to be implemented and managed** for those with osteoporosis

Potential value?

Improves **public awareness** on the dangers of osteoporosis

**Early diagnosis and risk identification**

Appropriate **treatment and management**

**Lowers the risk** of fractures

#### Link to Government Priorities



Osteoporosis is a musculoskeletal disease that forms part of the National Chronic Disease Strategy and National Strategic Framework for Chronic Conditions

There is an opportunity to take action in

- promoting **early detection**
- promoting **out of hospital care**
- appropriate **chronic disease management**, and
- improving **health outcomes related to osteoporosis**

#### Estimated Benefits



Pilot Program

- 430,000 people targeted over 2 years
- 170,000 people will have BMD scans
- 51,700 people will be newly diagnosed with osteoporosis
- 2,200 fractures prevented
- 71 people will stay in their homes longer
- \$58.9 million in benefits of avoided direct costs

Action	Detail
<b>2.3.1</b> In partnership with health care system stakeholders, OA to establish a National Pilot Program Steering Committee	<p>The National Pilot Program Steering Committee would provide the leadership, expertise and authority to oversee the development and implementation of the Pilot program including:</p> <ul style="list-style-type: none"> <li>• identification of three PHNs to be actively targeted with up to 430,000 people over 70 targeted as well as identification of three additional PHNs to act as the control group,</li> <li>• establishment of a Central Registry Office, and</li> <li>• development of referral letter of invitation to participants.</li> </ul>
	<p>The six sites will include two metropolitan, two regional and two rural PHN regions. The Pilot Program will test participation and uptake based on people targeted who will subsequently:</p> <ul style="list-style-type: none"> <li>• have a BMD scan;</li> <li>• receive their diagnosis; and</li> <li>• if osteoporotic, progress to appropriate treatment and management.</li> </ul>
	<p>Participation will be tracked with informed consent by a Central Registry Office.</p>
<b>2.3.2</b> Establishment of a Central Registry Office in collaboration with Health and Human Services Departments to track implementation activities including information flow and registration	<p>The Central Registry Office would be authorised to access MBS and PBS data and implement the Program across the pilot sites. Responsibilities of this Office will include:</p> <ul style="list-style-type: none"> <li>• identifying the target population and postal addresses using Medicare information;</li> <li>• sending a letter of invitation to potential participants. This letter will include information on the burden of osteoporosis (for discussion with GP) and a referral for a BMD scan;</li> <li>• data collection and entry into the registry for monitoring and analysis of outcomes;</li> <li>• liaising with site teams on local campaigns and considerations; and</li> <li>• identifying areas for future improvement and options to increase effectiveness and efficiencies nationally.</li> </ul>
<b>2.3.3</b> Deliver local campaigns to help raise awareness around osteoporosis and the pilot program	<p>Local campaigns in the six pilot locations would help raise awareness, explain the program and support uptake. Various organisations could support this including the Australian Medical Association (AMA), OA, PHNs, and the RACGP. The campaigns will support uptake by targeting:</p> <ul style="list-style-type: none"> <li>• local at-risk individuals to increase their awareness of the risks of osteoporosis and value of participating; and</li> <li>• GPs to support uptake and assist with on-going management of osteoporosis for older people who often have co-morbidities and complex care needs, improve adherence to treatment and address any concerns on safety of treatment.</li> </ul>

Action	Detail
<b>2.3.4</b> Establish effective monitoring and reporting processes	<p>Monitoring and analysis would be conducted by the Central Registry Office across the six pilot sites to assess participation. Analysis to be conducted through monitoring:</p> <ul style="list-style-type: none"> <li>• utilisation of MBS codes for dual-energy X-ray (DXA) scanning by gender, age sub-cohort and region; and</li> <li>• osteoporosis medication being prescribed under PBS during the two-year pilot, and analysis of uptake and adherence.</li> </ul>
<b>2.3.5</b> Conduct an evaluation of the Pilot program	<p>An evaluation of the Pilot program will be conducted by an expert team to determine impact and lessons learned from the pilot sites that will aid the national roll out of the Program.</p>



## Priority 3:

### Data collection, monitoring and strategic research



#### What we want to achieve:

- Development of an integrated decision support and management platform (clinical platform) to enable better GP and other health professional patient interactions in both hospital and primary care settings.
- Development of data collection processes and technical capabilities to integrate a clinical platform with existing Electronic Management Records (EMR) systems in both hospitals and primary care settings.
- Investment in strategic priority research supporting translation and implementation to improve patient care and outcomes.

#### Why is this important?

Information technology (IT) is a critical enabler in providing clinical decision support for GPs, specialists and patients. Quality outcomes data capture, ongoing monitoring and sharing data is essential for translational research purposes, driving ongoing improvements and effective stakeholder collaboration in the area of chronic disease management including osteoporosis. Better integration of public and private IT platforms is key

moving forward in driving for truly comprehensive and integrated patient care.

In particular, greater investment in strategic priority driven research and supporting a more multi-disciplinary and interdisciplinary collaborative approach to health system and translational research is critical for building the much needed evidence base to drive quality improvements in osteoporosis management and care.

# Objectives and Actions

## Objective 3.1

Develop or enhance an integrated decision support and management platform (clinical platform) to enable better GP and other health professional patient interactions in both hospital and primary care settings

Action	Detail
<b>3.1.1</b> Assess the validity and value of existing algorithms(e.g. FRAX, Garvan Risk Calculator) for clinical platforms to provide a risk calculation of osteoporosis and fracture	Scope technical requirements for the development of a new clinical platform and/or for enhancement of existing IT capabilities to provide a risk calculation of osteoporosis and fracture and personalised recommendations for patient management to be used in both primary care and/or hospital settings.
<b>3.1.2</b> Integrate algorithms and recommendations with risk assessment for clinical platforms that is an innovative easy tool for clinicians to enhance patient care	Scope and develop technical requirements for the integration of clinical algorithms and recommendations into clinical platforms that will provide innovative easy tools for clinicians to enhance patient care. These tools will be implementable across the many and varied practice and clinical IT systems used by primary health care providers including allied health.
<b>3.1.3</b> Identify critical parameters for monitoring of collected data to enable generation of clinical reports and epidemiological data on patient outcomes for use by key health system stakeholders	<p>Develop a set of clinical reports that can be generated automatically to record critical outcomes for osteoporosis and fracture for individual patients and patient cohorts in line with best practice clinical guidelines.</p> <p>Develop set of national benchmarks (health informatics) to understand best practice management and impact.</p>
<b>3.1.4</b> Enhance community and patient engagement for osteoporosis management and care by developing mobile interoperable applications (with clinical platforms)	Explore and develop digital enabled strategies for the development of mobile interoperable applications (with clinical platform) to collect data for clinical assessment outcomes and allow for feedback on individual patient plans and actions related to the osteoporosis management including treatments.

### Objective 3.2

Develop data collection processes and technical capabilities to integrate a clinical platform with existing EMR systems in hospitals and primary care

Action	Detail
<b>3.2.1</b> Explore digitally enabled strategies to enhance data collection by automated data capture from key EMR systems in hospital and primary care settings	Engage with key EMR providers in both settings (nationally for primary care and state-wide for public hospitals) to explore digitally enabled strategies for integration of a clinical platform with EMR systems.
	Scope technical requirements and capabilities for automated data capture and transfer of relevant parameters.
<b>3.2.2</b> Develop capability to link relevant clinical data from existing patient registries and key health record database	Engage with the Australian Digital Agency and existing patient registries (e.g. ANZ Hip Fracture Registry) to explore strategies for clinical data integration.
	Scope technical requirements and capabilities to achieve this clinical data integration.

### Objective 3.3

Drive strategic priority research supporting translation and implementation research to improve patient care and outcomes

Action	Detail
<b>3.3.1</b> Fund and commission high quality translation, implementation and evaluation research projects that will lead to improved prevention, diagnosis, management and care in the area of osteoporosis and fracture prevention	<p>Explore and identify new opportunities from the MRFF, NHMRC and other relevant organisations to increase investment into strategic priority driven research for osteoporosis and fracture prevention.</p> <p>Specifically, the MRFF Priorities for 2018-2020 identified Digital Health Intelligence, Primary Care Research and Public Health Interventions which are highly relevant to this Action Plan .</p>
	<p>Build national collaborative interdisciplinary research partnerships between Universities, health services, consumers and at risk population groups and the broader research sector.</p>

# Achieving Progress

Further work is required to operationalise each of the three Priorities and develop the specific implementation details as described in this National Strategic Action Plan for Osteoporosis. It is proposed that a National Implementation Steering Group led by Osteoporosis Australia be established to drive, prioritise and oversee the implementation of these Priorities. Specifically it would be tasked with identifying appropriate implementation partners for each Priority area, establishing required Priority Working Committees/Advisory Groups to develop implementation details for specific actions, ensuring there is appropriate resource allocation as well as identifying key performance indicators and measures for monitoring, assessing and reporting progress on the Plan's implementation.

Overall progress in implementing the Action Plan will be reviewed on an annual basis, with a major review and evaluation at five years.

## Partnerships

Establishing and building effective partnerships and collaborations with key stakeholders and groups will be critical to implement this Plan's Priorities and actions. Implementation partners will vary according to specific actions but will include:

- People living with osteoporosis, their families, carers and consumer groups
- Australian and state and territory governments, departments of health and ageing and national agencies such as the Australian Institute of Health and Welfare and the Australian Commission of Safety and Quality in Health Care
- Primary, secondary and tertiary healthcare providers in both the public and private sectors
- Primary care structures and clinics including GP networks and practices
- Health organisations including PHNs, LHDs, NPS MedicineWise
- Osteoporosis national/state clinical networks including the NSW Agency for Clinical Innovation
- Clinicians and health professional colleges (RACGP, RACP), specialty societies, peak bodies and associations
- Aboriginal Community Controlled Health Organisations
- Representatives of culturally and linguistically diverse groups
- Rural health organisations
- Industry including private health insurance providers, pharmaceutical and devices industry
- Universities, institutes (in particular the Garvan Medical Institute), alliances (SOS Fracture Alliance) and other relevant research collaborations/groups
- Public secondary high schools, relevant educational organisations and associated peak bodies
- Aged care providers and facilities
- Media and marketing agencies, digital product and IT system developers

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# Appendix A:

## National Osteoporosis Action Plan Stakeholder Group

- **Dr Andreas Loeffler:** Orthopedic surgeon, Prince of Wales Hospital, NSW
- **Professor Belinda Beck:** Centre for Musculoskeletal Research, School of Allied Science, Griffith University
- **Carole David:** Consumer advocate
- **Dr Gabor Major:** Rheumatologist, Newcastle John Hunter Hospital, NSW
- **Professor Jacqueline Center:** Endocrinologist, Sydney St Vincent's Hospital and Garvan Institute of Medical Research
- **Professor Jacqueline Close:** Co-Chair, Australian and New Zealand Hip Fracture Registry. Director, Neuroscience Research Australia
- **Professor John Eisman AO:** Endocrinologist, Sydney St Vincent's Hospital and Garvan Institute of Medical Research
- **Professor Kerrie Sanders:** Department of Medicine University of Melbourne, co-author Osteoporosis Australia national and state burden of disease reports.
- **Dr Linda Swan:** Chief Medical Officer, Medibank
- **Professor Lyn March AM:** Representative Fragility Fracture Network (FFN), Rheumatologist, School of Medicine, University of Sydney
- **Professor Mark Cooper:** Endocrinologist, School of Medicine, University of Sydney, Concord Repatriation General Hospital
- **Professor Mark Kotowicz:** Endocrinologist, School of Medicine, Deakin University
- **Professor Markus Seibel:** Chair, SOS Fracture Alliance, Endocrinologist, Concord Repatriation General Hospital
- **Martina Clark:** Consumer advocate, Director of Carers' Couch
- **A/Professor Nicholas Pocock:** Senior Staff Specialist, Department of Nuclear Medicine, St Vincent's Hospital Sydney
- **Professor Peter Croucher:** President Australia and New Zealand Bone and Mineral Society, Head Bone Biology Division, Garvan Institute of Medical Research
- **Professor Peter Ebeling AO:** Endocrinologist, Head, Department of Medicine, Monash University
- **A/Professor Peter Wong:** Rheumatologist, Coffs Harbour Health Campus and UNSW Rural Clinical School, NSW
- **Professor Richard Prince:** Endocrinologist, School of Medicine and Pharmacy, University of Western Australia
- **Professor Ego Seeman AM:** Endocrinologist, Austin Repatriation Hospital, Victoria
- **Dr Jane Elliott:** GP, North Adelaide Family Practice, South Australia
- **Dr Chris Hogan:** GP and Associate Professor University of Melbourne, Victoria
- **Dr Charles Inderjeeth:** Geriatrician and Rheumatologist, University of Western Australia, Sir Charles Gairdner Hospital
- **A/Professor Chris White:** Endocrinologist Royal Prince Alfred Hospital, NSW
- **Professor Gustavo Duque:** Chair of Medicine, Western Health, Director – Australian Institute for Musculoskeletal Science (AIMSS), Geriatrician, Melbourne University
- **Kevin Thompson:** Assistant Director Chronic Disease Policy Branch, Federal Department of Health
- **Robyn Speerin:** Former Head of Musculoskeletal Network, NSW Agency for Clinical Innovation
- **A/Professor Rory Clifton-Bligh:** Endocrinologist, Royal North Shore Hospital
- **Dr Sonia Stanton:** Endocrinologist, ACT Canberra Hospital and Health Service
- **Dr Weiwen Chen:** Endocrinologist, Sydney St Vincent's Hospital
- **A/Professor Justine Waters:** Public health and prevention, Australian Centre for Public and Population Health Research, University of Technology Sydney

## National Osteoporosis Action Plan Working Committee

- **Professor Peter Ebeling AO:** Medical Director, OA, Endocrinologist, Head, Department of Medicine, Monash University
- **Dr Jane Elliott:** GP, North Adelaide Family Practice, South Australia
- **Dr Chris Hogan:** GP and Associate Professor University of Melbourne, Victoria
- **Carole David:** Consumer advocate
- **Martina Clark:** Consumer advocate, Director Carers' Couch
- **Dr Weiwen Chen:** Endocrinologist, Sydney St Vincent's Hospital
- **A/Professor Nicholas Pocock:** Bone densitometry, Sydney St Vincent's Hospital

## Secretariat

- **Greg Lyubomirsky:** CEO, Osteoporosis Australia
- **Melita Daru:** Marketing Manager, Osteoporosis Australia
- **A/Professor Justine Waters:** Australian Centre for Public and Population Health Research, University of Technology Sydney (report writer)

# Appendix B:

## National Osteoporosis Australia Scientific and Medical Advisory Committee

- **Professor Belinda Beck:** Centre for Musculoskeletal Research, School of Allied Science, Griffith University
- **Dr Gabor Major:** Rheumatologist, Newcastle John Hunter Hospital, NSW
- **Professor Jacqueline Close:** Co-Chair, Australian and New Zealand Hip Fracture Registry. Director, Neuroscience Research Australia
- **Professor Mark Cooper:** Endocrinologist, School of Medicine, University of Sydney, Concord Repatriation General Hospital
- **Professor Markus Seibel:** Chair, SOS Fracture Alliance, Endocrinologist, Concord Repatriation General Hospital
- **A/Professor Nicholas Pocock:** Senior Staff Specialist, Department of Nuclear Medicine, St Vincent's Hospital Sydney
- **Professor Richard Prince:** Endocrinologist, School of Medicine and Pharmacy, University of Western Australia
- **Dr Jane Elliott:** GP, North Adelaide Family Practice, South Australia
- **Dr Charles Inderjeeth:** Geriatrician and Rheumatologist, University of Western Australia, Sir Charles Gairdner Hospital
- **Dr Weiwen Chen:** Endocrinologist, Sydney St Vincent's Hospital
- **Professor Peter Ebeling AO:** Medical Director, OA, Endocrinologist, Head, Department of Medicine, Monash University
- **Professor Robin Daly:** Chair in Exercise and Ageing, Faculty of Health, Deakin University, Melbourne
- **Professor Deborah Kerr:** Nutrition and Dietetics, School of public Health, Curtin University
- **Professor Stephen Lord:** Senior Principal Research Fellow, Neuroscience Research Australia.
- **Maria A. Fiatarone Singh:** Geriatrician, John Sutton Chair of Exercise and Sport Science in the Faculty of Health Sciences, and Professorship, Sydney Medical School, at the University of Sydney
- **A/Professor Peter Nash:** Rheumatology, Coast Joint Care, Maroochy Waters
- **Dr Peter Del Fante:** School of Health Sciences, University of South Australia.
- **Dr Davor Saravanja:** Orthopaedic Spinal Surgeon working at Macquarie University Hospital Orthopaedic Department