CLINICAL STANDARDS

For Australian Secondary Fracture Prevention Services

2025

Fracture Alliance

Making the first break the last

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The Australian National Alliance for Secondary Fracture Prevention

Among high-income countries, Australia has one of the world's poorest rates of identifying and managing people who have suffered an osteoporotic fracture. Some 70 to 80 per cent of men and women who have sustained a fragility fracture are not investigated for, or diagnosed with osteoporosis, nor do they receive appropriate medical management and follow-up. As those who sustain a fragility fracture are at high risk of further fracture, the number of preventable fractures impacting patients, their families and the healthcare system are steadily growing.

The Australian National Alliance for Secondary Fracture Prevention (SOS Fracture Alliance, SOSFA) unites 41 medical, nursing, allied health, patient advocacy, carer and other organisations under its umbrella. They share a common goal – to 'make the first break the last' by improving the care of people presenting with an osteoporotic fracture. The SOS Fracture Alliance is working to close this unacceptable gap in osteoporosis care, which affects some of the most vulnerable members of our society.

The SOS Fracture Alliance strongly advocates the nation-wide implementation of

- Secondary Fracture Prevention Services in hospitals and primary/community care,
- Clinical Standards for such services, and
- An Australian National Fragility Fracture Registry.

For more information about the Alliance, visit www.sosfracturealliance.org.au

Secondary fracture prevention services

Fractures following minimal trauma are the hallmark of osteoporosis[1]. The Osteoporosis & Fractures in Australia Burden of Disease Report 2023-2033[2], published in October 2024, states that "in 2023, there were an estimated 193,482 osteoporosis and osteopenia-related fractures. By 2033, this number of fractures is projected to increase […] to 237,632 fractures." Any osteoporotic (fragility) fracture predisposes people to further 'secondary' fractures, morbidity and premature death[3,4]. We call these first fractures "sentinel" or "index" fractures, knowing that the timely diagnosis and treatment of osteoporosis prevents further fractures. Safe, effective and generally inexpensive medications are available on the Pharmaceutical Benefits Scheme (PBS) and virtually all osteoporosis guidelines recommend long-term treatment for people who have sustained a fragility fracture[5-9]. However, the literature provides ample proof that most people, particularly older women, who suffered a fragility fracture are neither assessed for osteoporosis nor appropriately treated to prevent further fractures[10-15].

To close this "osteoporosis care gap", systematic interventions in the form of Secondary Fracture Prevention Services have been implemented worldwide. These programs, aka 'Fracture Liaison Services" (FLS) or "Osteoporotic Refracture Prevention (ORP)" programs, aim to improve the management of patients with osteoporotic fracture. In general, they follow the internationally recognised '5IQ' system, where the five "I"s stand for systematic Identification, Investigation, Intervention, Information and Integration, while the "Q" signifies the need for Quality[52,52]. A systematic review evaluating fracture prevention programs demonstrated that intensive, co-ordinated services ("type A models") are more effective in increasing treatment initiation rates than those based solely on patient or doctor education ("type C, D models"), reducing the number of refractures by 20-60%[16, 17]. An analysis by the Sax Institute[18] demonstrated that Australian Secondary Fracture Prevention Services are highly heterogeneous regarding both processes and quality. However, for services to effectively prevent further fractures, certain procedural features need to exist and be complied with.

The present Clinical Standards provide guidance for Secondary Fracture Prevention Services to benchmark quality care and, if used in conjunction with the Australian & New Zealand Fragility Fracture Registry, will lead to reduced clinical variability and quality improvement.

The Australian & New Zealand Fragility Fracture Registry

National and international hip fracture registries have been established in 23 countries in Asia Pacific[19-24], Europe[25-36] and the Americas[37-39]. These registries provide a mechanism for hospitals to benchmark in real time their provision of care against clinical standards for various aspects of acute hip fracture management and secondary prevention[40,41]. To provide a similar mechanism to benchmark the provision of care delivered by Secondary Fracture Prevention Services for all types of fragility fractures, Fracture Registries have been established by the Royal College of Physicians in the UK[42], the US[43], Spain[44] and Ireland[45].

In 2022, the SOS Fracture Alliance and Osteoporosis New Zealand established the Australian & New Zealand Fragility Fracture Registry. This Registry aims to:

- Enable the performance of Secondary Fracture Prevention Services in Australia and New Zealand to be benchmarked against specific Clinical Standards for such services.
- Identify variation in service delivery and patient management across healthcare systems and provide services with data – in real time – to drive system level improvement.
- Provide publicly available information so that patients can confirm that they receive the standard of care they need after a fragility fracture.
- Improve patient focus over time through automatic uploading of patient data and direct reporting to reduce administrative time within the service.
- Provide data for research, nationally and internationally.
- Document the lived experience of people who sustain fragility fractures with patient-reported experience measures and patient-reported outcome measures.
- Enable benchmarking of Australian & New Zealand Secondary Fracture Prevention Services against international registries and similar services.

The New Zealand arm of the Registry has been extremely successful as documented in the 2024 report (https://fragilityfracture.co.nz/2024-annual-report/) and in Mitchell et al.[46]. The Australian Arm of the Registry (https://fragilityfracture.com.au/patient-registry/), which operates under the auspices of the Australian Fragility Fracture Foundation[47] and the SOS Fracture Alliance, is still in its infancy but several Australian Secondary Fracture Prevention Services have joined, and more are expected to participate in the future.

Why Clinical Standards for Secondary Fracture Prevention Services?

Clinical or Quality Standards for Secondary Fracture Prevention Services have been developed in Canada[48], Japan[49], New Zealand[50, 51], the United Kingdom[52, 53] and Egypt[54]. The International Osteoporosis Foundation (IOF)'s Best Practice Framework provides inter-nationally endorsed standards for Secondary Fracture Prevention Services[55-58]. In 2020, the IOF in collaboration with the Fragility Fracture Network (FFN) and the US National Osteoporosis Foundation (NOF) published a patient-level key performance indicator set to measure the effectiveness of Secondary Fracture Prevention Services and guide quality improvement. In 2021, the Asia Pacific Consortium on Osteoporosis (APCO)[59] published clinical standards for the screening, diagnosis, and management of osteoporosis in the Asia-Pacific region[60].

The primary purpose of the SOSFA Clinical Standards for Secondary Fracture Prevention Services is to provide Australian health professionals and health services with a clearly structured approach to the management of patients who have suffered an osteoporotic fracture, ensuring that older people at high risk of secondary fractures receive targeted interventions, early treatment, and holistic post-fracture care that addresses both bone health and other age-related health factors. Furthermore, the standards allow for the benchmarking and, if required, improvement of the care and cost effectiveness of any given service, **particularly if used in conjunction with the Australian & New Zealand Fragility Fracture Registry**. This concept has proven successful with the Australian & New Zealand Hip Fracture Clinical Care Standard, which over the past decade has led to significant improvements in hip fracture management and excellent outcomes not only for older people but also for the Australian health budget.

The SOSFA Clinical Standards for Australian Secondary Fracture Prevention Services builds on the second edition of the New Zealand Clinical Standards published in 2021[51], which incorporate the IOF-FFN-NOF set of key performance indicators[61] within the "5IQ" structure - i.e. clinical standards relating to identification, investigation, information, intervention, integration and quality of Secondary Fracture Prevention Services. The key performance indicators relating to provision of information are informed by the relevant APCO clinical standard[60].

Consultation Process

A draft version of the Clinical Standards for Australian Secondary Fracture Prevention Services was circulated via email to the organisations listed below for comment. Responses were received between January and April 2025, and where comments and suggestions improved the clarity, focus and practical applicability of the Standards, changes were made to the original draft. The resulting document was then issued to all relevant stakeholders and organisations to seek their endorsement.

- Arthritis & Osteoporosis Tasmania
- Arthritis & Osteoporosis Western Australia
- Australian and New Zealand Bone & Mineral Society
- Australian and New Zealand Fall Prevention Society
- Australian and New Zealand Hip Fracture Registry
- Australian and New Zealand Orthopaedic Nurses' Alliance
- Australian and New Zealand Orthopaedic Research Society
- Australian and New Zealand Society for Geriatric Medicine
- Australian and New Zealand Society for Sarcopenia & Frailty Research
- Australian College of Nurse Practitioners
- Australian College of Rural and Remote Medicine
- Australian Orthopaedic Association
- Australian Physiotherapy Association
- Australian Rheumatology Association
- Carers Australia
- Carers NSW
- COTA Australia
- Country Women's Association of NSW
- Country Women's Association of WA
- Dietitian Association of Australia
- Endocrine Nurses Society of Australasia
- Endocrine Society of Australia
- Exercise and Sports Science Australia
- Fracture Liaison Network New Zealand
- Healthy Bones Australia
- Musculoskeletal Health Australia
- Older Women's Network New South Wales
- Osteoporosis NZ
- Physiotherapy New Zealand
- Public Health Association of Australia
- Queensland CWA
- Rehabilitation Medicine Society of Australia and New Zealand
- Royal Australasian College of Physicians
- Royal Australasian College of Surgeons
- Royal Australian and New Zealand College of Obstetricians & Gynaecologists
- Royal Australian and New Zealand College of Radiologists
- Royal Australian College of General Practitioners

Endorsing Organisations

Please note: The numerators and denominators in the KPIs that follow are predicated on an annual period of review. When services undertake ongoing benchmarking on a monthly or quarterly basis the denominators should be adjusted accordingly.

Standard 1: Identification

All people aged 50 years and older who sustain a fragility fracture will be systematically and proactively identified by the service.

Key Performance Indicators:

KPI 1: **Identification of people with non-vertebral fragility fractures**

Please note: Fragility fractures are fractures that occur after no or only minimal trauma. A common definition is a fracture after a load or impact that would not ordinarily be expected to cause a fracture, such as a fall from standing height, a sudden jolt or lift. The decision whether a fracture is minimal trauma or not is a clinical one based on the individual profile and the circumstances of the person. Non-vertebral fragility fractures are defined as all non-vertebral fragility fractures, including hip fractures but excluding fractures of the face, skull, scaphoid and digits (fingers and toes).

Numerator: The total number of people with non-vertebral fragility fractures identified annually by the Secondary Fracture Prevention Service.

Denominator: The expected annual local number of non-vertebral fragility fractures can be estimated by multiplying the annual number of hip fractures that occur in the catchment area of the service by five.

KPI 2: **Identification of people with vertebral fragility fractures**

Numerator: The total number of people with vertebral fragility fractures identified annually by the Secondary Fracture Prevention Service.

Denominator: The expected annual local number of clinically apparent vertebral fragility fractures is expected to be 75% of the local annual number of people with a hip fracture.

Standard 2: Investigation

People aged 50 years or older with a fragility fracture will undergo a clinical assessment including screening for secondary causes of osteoporosis, future fracture risk and falls risk.

Key Performance Indicators:

KPI 3: **Initial investigation and fracture risk assessment within 12 weeks**

Please note: It is recognised that bone mineral density (BMD) testing by dual-energy X-ray absorptiometry (DXA) may not be required in all people, and so DXA is included in KPI 4.

Numerator: The number of people annually who undergo initial investigation including fracture risk assessment within 12 weeks of the index/sentinel fracture.

Denominator: The total number of people with fragility fracture identified (i.e. non-vertebral, hip and vertebral fractures combined).

KPI 4: **DXA scan within 12 weeks**

Please note: Although DXA is recommended after a fragility fracture, treatment must not be delayed if DXA is unavailable.

Numerator: The number of people annually who have a DXA scan within 12 weeks of the index/sentinel fracture.

Denominator: 50% of the total number of people with fragility fracture identified (i.e. 50% of non-vertebral, hip and vertebral fragility fractures combined).

KPI 5: **Falls risk screening within 12 weeks**

Numerator: The cumulative total number of people annually, who, within 12 weeks of the index/sentinel fracture:

- received falls risk screening or were recommended to do so, or
- were referred to a physiotherapist, accredited exercise physiologist or falls prevention service, or were already in their care immediately prior to sustaining the index/sentinel fracture.

Denominator: The total number of people with fragility fracture identified (i.e. non-vertebral, hip and vertebral fragility fractures combined).

Standard 3: Information

People with fragility fracture, their family members, and/or carers will be provided with valid information on bone health, lifestyle measure and nutrition, and the relationship between poor bone health, risk factors for falls (such as sarcopenia, muscle weakness, malnutrition) and fracture risk. Information will be given in their own language and in plain language, avoiding medical jargon.

Key Performance Indicators:

KPI 6: **Provision of an information package within 12 weeks of the index/sentinel fracture**

Numerator: The number of people who receive information about poor bone health, risk factors for falls and fracture risk from the service, provided in their own language, without medical jargon and through a medium preferred by the person, their family members and/or carers. (NB: Appropriate material in numerous languages can be found at the Healthy Bones Australia website).

Denominator: The total number of people with fragility fracture identified (i.e. non-vertebral, hip and vertebral fragility fractures combined).

KPI 7: **Self-assessment of bone health by family members of people with fragility fracture**

Meta-analyses have demonstrated that any parental history of fragility fracture (particularly of a hip fracture) confers an increased risk of fracture that is independent of bone mineral density [62]. Accordingly, increasing awareness of bone health among adult children and siblings of people with fragility fracture could be beneficial to those family members. The free Know your Bones™ online self-assessment tool can be used by family members to assess their own bone health (accessible at https://www.knowyourbones.org.au/).

Numerator: The number of people with fragility fracture provided with information on the Know your Bones™ tool to be shared with family members, annually.

Denominator: The total number of people with fragility fracture identified (i.e. non-vertebral, hip and vertebral fractures combined).

*KPIs 8-A and 8-B are **confirmatory checkpoints** to assess whether planned interventions were documented within a specific time frame. In contrast, KPI 9 documents whether the person who fractured or their carer **was contacted for follow-up** within the specified time frame.*

Standard 4: Intervention

People aged 50 years or older with a fragility fracture at high risk of sustaining future fractures and/or falls will be offered appropriate treatment with PBS subsidised medicines and be referred for multicomponent (exercise, nutrition) interventions to support bone health and muscle strength, to reduce falls risk.

Key Performance Indicators:

KPI 8-A: **Appropriate pharmacotherapy was recommended by the service or other health professionals within 12 weeks of the index/sentinel fracture.**

Please note: Pharmacotherapy for osteoporosis includes bisphosphonates, raloxifene, denosumab, teriparatide and romosozumab, but not calcium and/or vitamin D supplements. Menopausal hormone therapy (MHT) may be considered as first-line therapy for women within 10 years of menopause.

Numerator: The number of people with fragility fracture annually who were recommended to be commenced on appropriate pharmacotherapy for osteoporosis within 12 weeks of the index/ sentinel fracture. This includes the cumulative total of people with fracture that were:

- recommended to be commenced on appropriate pharmacotherapy because of the index/sentinel fragility fracture (i.e. not receiving treatment prior to the fracture), or
- treated appropriately for osteoporosis prior to the index/sentinel fragility fracture and that prior treatment was recommended to be continued, or
- treated prior to the index/sentinel fragility fracture and a recommendation/ decision was made to change the prior treatment to another osteoporosis treatment during the index/sentinel fracture episode.

Denominator: The total number of people with fragility fracture identified (i.e. non-vertebral, hip and vertebral fractures combined) minus the number of people who have died. (Where available, the number of people considered not for further assessment - e.g. because of short life expectancy - should also be excluded from the denominator).

Standard 4: Intervention (continued)

Key Performance Indicators:

KPI 8-B: **Dedicated strength and balance program recommended by the service or health professional within 12 weeks of the index/sentinel fracture**

Please note: Exercise interventions include bone-targeted supervised resistance and impact training (e.g. 'ONERO') and balance training (e.g. 'Stepping On' or 'Otago') to prevent falls,[63] but not low intensity, non-specific exercise such as walking, swimming, cycling or light weights. Exercise programs should be tailored to the individual by qualified health professionals. Local programs are preferred to encourage uptake.

Numerator: The number of people with fracture annually, who were recommended participation in a bone-targeted resistance and impact training and/or balance training to prevent falls within 12 weeks of the index/sentinel fracture.

Denominator: The cumulative total of people with fragility fracture annually considered to require strength and balance training after a falls and bone health assessment minus the number of people who have died. (Where available, the number of people considered not for further assessment - e.g. because of short life expectancy - should also be excluded from the denominator.)

KPI 9: **Recorded follow-up within 20 weeks of the index/sentinel fracture**

Numerator: The number of people with fragility fracture annually, with recorded follow-up within 20 weeks of the index/sentinel fracture.

Denominator: The total number of people with fragility fracture annually initiated on, or recommended treatment for osteoporosis minus the number of people who had died within 20 weeks of their fragility fracture. (Where available, the number of people considered not for further assessment - e.g. because of short life expectancy - should also be excluded from the denominator.)

*KPIs 10 and 11 focus on outcomes **following actual follow-up** — that is, whether the patient has been initiated on, or resumed pharmacotherapy and/or strength and balance training. These KPIs imply a higher level of patient engagement beyond just the recommendation phase. Thus, KPIs 10 and 11 assess whether follow-up translated into a tangible clinical action.*

Standard 4: Intervention (continued)

Key Performance Indicators:

KPI 10: **Commenced or resumed appropriate pharmacotherapy for osteoporosis within 20 weeks of the index/sentinel fracture**

Numerator: The number of people with fragility fracture annually, who commenced or resumed appropriate pharmacotherapy for osteoporosis within 20 weeks of the index/sentinel fracture.

Denominator: The cumulative total of people with fragility fracture annually, who received a recommendation to commence or resumed pharmacotherapy for osteoporosis, or were referred to a GP or another clinician to prescribe pharmacotherapy for osteoporosis minus the number of people who had died within 20 weeks of fracture. (Where available, the number of people considered not for further assessment - e.g. because of short life expectancy - should also be excluded from the denominator.)

KPI 11: **Commenced or resumed dedicated strength and balance program within 20 weeks of the index/sentinel fracture**

Numerator: The number of people with fracture annually who initiated or resumed bone-targeted supervised resistance and impact training and/or balance training to prevent falls within 20 weeks of the index/sentinel fracture.

Denominator: The cumulative total of people with fragility fracture annually considered to require strength and balance training after a falls and bone health assessment minus people who had died within 20 weeks of the index/sentinel fracture. (Where available, the number of people considered not for further assessment - e.g. because of short life expectancy - should also be excluded from the denominator.)

Standard 5: Integration

The Secondary Fracture Prevention Service, in partnership with the person with fracture and their general practitioner, develops a long-term management plan to reduce risk of falls and fractures, and promote long-term management.

Key Performance Indicators:

KPI 12: **Provision of long-term management plan within 20 weeks of the index/sentinel fracture**

Numerator: The number of people with fragility fracture who received a long-term management plan within 20 weeks of the index/sentinel fracture.

Denominator: The total number of people with fragility fracture identified (i.e. non-vertebral, hip and vertebral fractures combined) minus people who had died within 20 weeks of the index/sentinel fracture. (Where available, the number of people considered not for further assessment - e.g. because of short life expectancy - should also be excluded from the denominator.)

KPI 13: **People being treated for osteoporosis 52 weeks after the index/sentinel fracture**

Please note: Pharmacotherapy for osteoporosis includes bisphosphonates, raloxifene, denosumab, teriparatide and romosozumab, but not calcium and/or vitamin D supplements. See also note to KPI 8-A.

Numerator: Number of people still being appropriately treated for osteoporosis 52 weeks after the index/sentinel fracture. Treatment includes pharmacotherapy to reduce fracture risk and/or dedicated strength/balance training to reduce falls risk.

Denominator: The cumulative total of people with fragility fracture annually, who commenced treatment for osteoporosis (i.e. pharmacotherapy and/or dedicated strength / balance training), minus the number of people who had died within 52 weeks of fracture. (Where available, the number of people considered not for further assessment - e.g. because of short life expectancy - should also be excluded from the denominator.)

Standard 6: Quality

The Secondary Fracture Prevention Service will undertake ongoing performance review enabled by participation in the Australian arm of the Australian and New Zealand (ANZ) Fragility Fracture Registry and ensure appropriate Continuing Professional Development (CPD) for staff engaged with the service.

Key Performance Indicators:

KPI 14: **Continuing Professional Development for service staff**.

Numerator: Number of service staff who in the previous two years undertook at least one CPD activity specific to secondary fracture prevention.

Denominator: Total number of staff involved in delivery of clinical aspects of the service.

KPI 15: **ANZ Fragility Fracture Registry Participation**

Numerator: Number of KPIs 1-14 with more than 80% complete data entered into the Australian arm of the ANZ Fragility Fracture Registry.

Denominator: Number of KPIs 1-14 where data entry in the ANZ Fragility Fracture Registry has commenced.

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