

ABSTRACT

Fragility fractures will affect one-third of women and one-fifth of men 50 years old and older worldwide.¹ To prevent the inevitable rise in hip fracture occurrences, early patient identification is of paramount importance. Patients with timely osteoporosis diagnosis and appropriate management can remain fracture free. Fracture Liaison Services (FLSs) are care-coordinator-based secondary fracture prevention programmes that systematically identify fragility fracture patients, then assess, investigate and treat them for underlying osteoporosis as appropriate.² They are promoted by the International Osteoporosis Foundation (IOF) as a cost-effective strategy for reducing the osteoporosis care gap, the refracture rate, and mortality.^{3,4} Identifying patients with high fracture risk using the WHO fracture risk assessment tool (FRAX), and discussing the treatment thresholds based on patient's ideas, concerns, expectations and care goals, using a shared decision-making approach, is a patient-centric and cost-effective way to manage osteoporosis and prevent fractures.

Keywords:

Osteoporosis; Fracture Liaison Service; Fracture Care;

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INTRODUCTION

Fragility fractures will affect one third of women and one fifth of men 50 years old and older worldwide.¹ Because of its rapidly ageing population, the Asia-Pacific (AP) region will have a disproportionately high number of fragility fractures. It has been estimated that by 2050, more than 50 percent of osteoporosis-related hip fractures will occur in the AP region.¹ There is a pervasive worldwide treatment and strategy gap for preventing fragility fractures.⁵ Despite the availability of medications proven to prevent further fractures, most patients with incident fragility fractures are not investigated or treated for underlying osteoporosis. Among postmenopausal women in Asia who have had hip fractures, only 52 percent were told that they had osteoporosis, 28 percent underwent bone mineral density (BMD) tests, and 33 percent were treated for osteoporosis within 6 months after discharge.⁶

In Singapore, the proportion of people 50 years and older is expected to make up almost 1 in 2 people by 2050.¹ Around 55,000 Singaporean women 50 years and older were estimated

in 2006 to have osteoporosis. With population ageing happening at this rate, these figures are expected to increase several-fold. Patients suffering hip fractures require long hospitalisation times and repeated rehabilitation. Older people with hip fractures experience pain and often lose their ability to lead active, productive, and independent lives. One study found that by 2050 in Singapore, the total cost of managing hip fractures within the first year after fracture would be estimated to reach US\$145 million.¹ The alarming clinical and economic burden of the incidence of osteoporosis-related fragility fractures will pose a serious challenge to the healthcare system in the coming years.

To prevent the inevitable rise in hip fracture occurrences, early patient identification is of paramount importance. Patients with timely osteoporosis diagnoses and appropriate management can remain fracture free. However, a lack of awareness among both physicians and patients about the disease is considered to be one of the biggest barriers to preventing fractures, and osteoporosis care in the AP region.¹ In particular, a case-finding approach for patients who have not developed a fragility fracture in the primary care setting will be essential. Family Physicians should also be empowered to confidently diagnose and start treatment in primary osteoporosis cases and recognise secondary causes that might need specialist attention.

Fracture Liaison Services

Fracture Liaison Services (FLSs) are care-coordinator-based secondary fracture prevention programmes that systematically identify fragility fracture patients, then assess and investigate and treat them for underlying osteoporosis as appropriate.² They are promoted by the International Osteoporosis Foundation (IOF) as a cost-effective strategy for reducing the osteoporosis care gap, the refracture rate, and mortality.^{3,4}

Singapore has implemented a Fracture Liaison Service (FLS) since 2008. More than half the hospitals in Singapore have implemented the programme which offers all patients over age 50 years who have suffered a fragility fracture to be included in an osteoporosis disease management plan. The programme aims to prevent second fragility fractures by combining appropriate medications, rehabilitation, and dedicated case-manager follow-up.⁸ The programme was first evaluated at Singapore General Hospital (SGH) in 2013, involving 1,400 patients recruited from the start of the programme in 2008. It showed that of the 287 patients who had completed a two-year follow-up, nearly 2 in 3 were compliant with the proposed exercise plan and almost 3 in 4 still compliant with osteoporosis medications after 2 years.

In 2013, the IOF launched the Capture the Fracture (CtF) campaign and released 13 benchmark FLS standards in a

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worldwide best-practice framework (BPF).² The CtF committee experts agreed that, because of the AP region's rapidly ageing population, the osteoporosis care gap after fragility fractures is substantially growing. Thus, it is encouraging that countries in the region are now actively and rapidly creating FLSs. The experts also agreed that although the 13 BPF standards and the 3 levels of standards were generally applicable in the AP region, they did need some modifications to improve their suitability for the region. The following suggestions were made:¹⁰

Standard 1: Patient Identification—Fracture patients within the scope of the institution (inpatient and/or outpatient facility or healthcare system) are identified to enable delivery of secondary fracture prevention.

Standard 2: Patient Evaluation—Fracture patients within the scope of the institution are identified and assessed for future fracture risk. This standard is concerned with the number of patients being assessed for subsequent fracture risk.

Standard 3: Post-fracture Assessment Timing—Post-fracture assessment for secondary fracture prevention is conducted in a timely fashion after fracture presentation.

Standard 4: Vertebral Fracture (VF)—The institution has a system whereby patients with previously unrecognised vertebral fractures are identified and undergo secondary fracture prevention evaluation. The majority of vertebral fractures are unrecognised or undetected.

Standard 5: Assessment Guidelines—The institution's secondary fracture prevention assessment, to determine the need for intervention, is consistent with local/regional/national guidelines.

Standard 6: Secondary Causes of Osteoporosis—The institution can demonstrate what proportion of patients who require treatment for prevention of secondary fractures should undergo further investigation (typically blood testing) to assess for underlying causes of low BMD. It is important to recognise why patients have osteoporosis.

Standard 7: Falls Prevention Services—Patients presenting with a fragility fracture, and who are perceived to be at risk of further falls, are evaluated to determine whether or not falls prevention intervention services are needed, and if so are subsequently referred to an established falls prevention service.

Standard 8: Multifaceted Health and Lifestyle Risk Factor Assessment—Patients presenting with fragility fractures undergo a multifaceted risk-factor assessment as a preventative measure to identify any health and/or lifestyle changes that, if implemented, will reduce future fracture risk, and those patients in need are subsequently referred to the appropriate multidisciplinary practitioner for further evaluation and treatment.

Standard 9: Medication Initiation—All fracture patients over 50 years, not on treatment at the time of fracture presentation,

are initiated or are referred to their primary care physician/provider for initiation, where required, on osteoporosis treatment in accordance with evidence-based local/regional/national guidelines.

Standard 10: Medication Review—For patients already receiving osteoporosis medications when they present with a fracture, reassessment is offered which includes a review of medication compliance, consideration of alternative osteoporosis medications, and optimisation of non-pharmacological interventions.

Standard 11: Communication Strategy—The institution's FLS management plan is communicated to primary- and secondary-care clinicians and contains information required and approved by local stakeholders.

Standard 12: Long-term Management—The institution has a protocol in place for long-term follow up of evidence-based initial interventions and a long-term adherence plan.

Standard 13: Database—All identified fragility fracture patients are recorded in a database which feeds into a central national database.

From the above standards, it will be possible for the Family Physician to observe all the standards except for 11 to 13, where organisational variation and contextual challenges may pose some constraints.

Identifying Patients with High Risk of Fracture

Family Physicians should screen and evaluate patients with risk factors for osteoporosis. A screening approach was recommended by NICE in 2012, when it proposed that all women aged 65 years or older and men aged 75 years or older should have a fracture risk assessment using the FRAX.¹¹ After an initial hip or vertebral fracture, risk of a second fracture more than doubles, with the highest risk in the first year.¹²

The WHO fracture risk assessment tool (FRAX) is used to predict the absolute 10-year fracture risk with or without BMD.¹³ It includes key risk factors for osteoporosis such as:

- A prior fragility fracture;
- Parental history of hip fracture;
- Current tobacco smoking;
- Long-term use of oral glucocorticoids;
- Rheumatoid arthritis;
- Other causes of secondary osteoporosis; and
- Daily alcohol consumption of 3 or more units.

The threshold for pharmacological intervention in Singapore is still a topic under review. Most practitioners will calculate the FRAX of an individual patient, and then discuss the intervention thresholds based on patient's ideas, concerns, expectations and care goals, using a shared decision-making approach.

Post-fracture Care

Providing patients with oral and written evidence-based information would facilitate exchanges with their Family Physicians regarding appropriate post-fracture care.¹⁴ Health empowerment focuses on bringing patients basic knowledge and skills to raise awareness of their health status.¹⁵ Patient-mediated strategies that enhance health literacy and self-management skills may be one way to improve osteoporosis management in the general population as the lack of time and lack of information on osteoporosis is a barrier to good management. As Singapore is pushing to become a smart nation, development of a cloud-based FLS App may have the potential to spread this model of care across the healthcare system, provide continuity of care, effectively manage osteoporotic patients, improve outcomes, and reduce medical costs.¹⁶

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LEARNING POINTS

- **Fracture Liaison Services (FLSs) are care-coordinator-based secondary fracture prevention programs that systematically identify fragility fracture patients, then assess and investigate and treat them for underlying osteoporosis as appropriate. It has been shown to be effective in improving case finding, adherence to therapy and fracture outcomes.**
 - **Family Physicians should screen and evaluate patients with risk factors for osteoporosis, in particular those with previous fragility fractures, and identify patients with high fracture risk using the WHO fracture risk assessment (FRAX) tool.**
 - **Identifying patients with high fracture risk using FRAX, and discussing the treatment thresholds based on patient’s ideas, concerns, expectations and care goals, using a shared decision making approach, is a patient centric and cost effective way to manage osteoporosis and prevent fractures.**
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