

How to start and expand Fracture Liaison Services

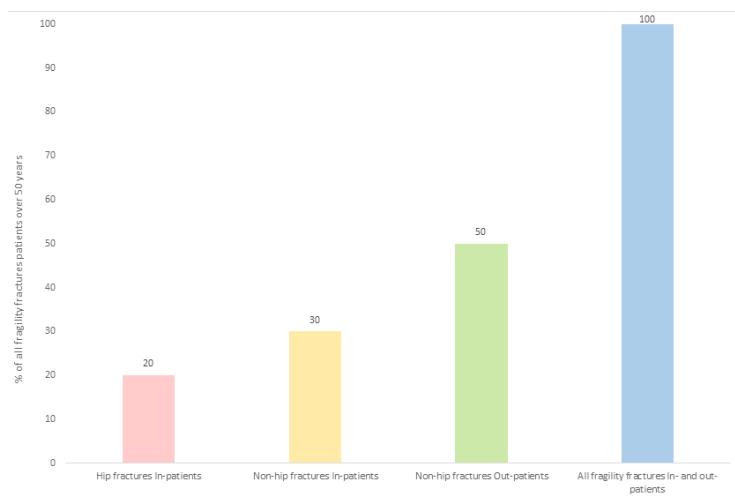
The International Osteoporosis Foundation (IOF) Capture the Fracture Campaign has recognized that development of Fracture Liaison Services (FLS) may occur in an incremental fashion, as has been the experience with some well-established FLS¹. IOF illustrated a staged approach to implementation, with hip fracture patients being targeted for secondary fracture prevention first, followed by fracture patients admitted to hospital with fractures other than hip, and finally those patients managed purely in the outpatient setting.

The objective of Osteoporosis Canada's *Make the FIRST break the LAST with Fracture Liaison Services* document is to establish a new standard of post-fracture osteoporosis care for all Canadians who suffer fragility fractures. However, we recognize that the most rapid path which leads to province-wide access to Osteoporosis Canada's recommended **Type A (3i) model** of FLS, which provides care for all fragility fracture sufferers, must be determined by local policy makers and health care professionals. The purpose of this Appendix is to illustrate a range of possible approaches that could be taken to achieve optimal service provision.

Six approaches to province-wide implementation of FLS will be considered:

1. Stepwise increase in the scope of FLS based on fracture types (e.g. starting with hip fractures and then incorporating other fracture types as in figure 1)
2. Implementation of an FLS Centre of Excellence with subsequent expansion to other localities
3. Incremental increase in the intensity of the FLS model
4. Enhancement of an intervention based on patient identification from provincial healthcare administrative databases or other electronic medical record systems
- 5) Case finding for vertebral fractures through Diagnostic Imaging - usually implemented after an FLS for orthopaedic type fractures (non-spine) is well established
- 6) Implementation of a province-wide Type A (3i) model of FLS from the outset to maximize health gains in the shortest time-frame possible

Figure 1. The scope of an FLS can be expanded as time and resources permit¹

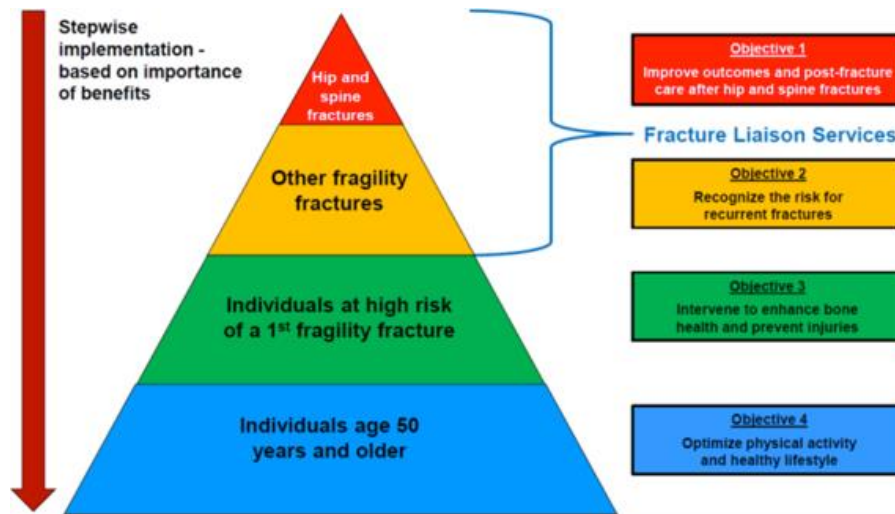


Various examples of these approaches follow, which are aligned to the priority for case-finding and secondary fracture prevention as advocated in Osteoporosis Canada's White Paper – *Towards a Fracture-Free Future*² – illustrated in figure 2. Osteoporosis Canada's Clinical practice guideline for management of osteoporosis and fracture prevention in Canada: 2023 update.³ identifies patients with hip and spine fractures as being at the highest risk of future fractures, followed by patients with fragility fractures at other skeletal sites including wrist, humerus and pelvis.

1. Stepwise increase in the scope of FLS based on fracture types

A province-wide strategy could be based upon establishment of a 3i FLS model that would first focus on case-finding patients with hip fractures and subsequently expand to include all fragility fracture sufferers as time and resources permit. Those provinces and centres which are involved in implementation of the National Hip Fracture Toolkit⁴ may be developing, or

Figure 2. A systematic approach to fragility fracture prevention for Canada²



- **Identification:** All men and women over 50 years of age who present with fragility fractures will be assessed for risk factors for osteoporosis and future fractures.
- **Investigation:** As per 2023 Osteoporosis Canada Guidelines, those at risk will undergo BMD testing.
- **Initiation:** Where appropriate, osteoporosis treatment will be initiated by the FLS.

These objectives are often referred to as the “3 i’s”. The FLS will employ dedicated personnel, usually

may have already developed, systems to ensure that hip fracture patients receive appropriate osteoporosis care on discharge. The FLS could now focus on adding case finding of non-hip fractures.

2. Implementation of an FLS Centre of Excellence with subsequent expansion to other localities

An alternate approach could be to establish an initial 3i FLS Centre of Excellence which would subsequently share best practices with all other sites that receive fragility fracture patients across the province. An outline for this approach is illustrated in figure 4. To ensure consistency of standards of care, a provincial standard for FLS could be defined at the outset in accordance with Osteoporosis Canada’s recommendations that the Type A (3i) model of FLS is the most effective model as described in detail in Appendix C.

3. Stepwise increase in the scope of FLS based on model intensity

Another alternative strategy for province-wide implementation could be based upon a phased expansion of the level of intensity of the FLS. Examples of the various models of care, of differing intensity are described in detail in Appendices C and D. In summary, the main objectives of an FLS include:

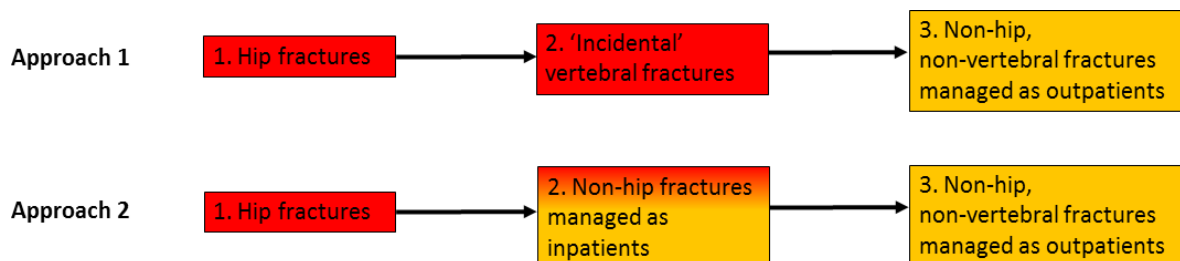
a nurse practitioner (NP) or a registered nurse (RN), to coordinate the fracture patient’s care. The NP can provide all 3 i’s whereas the RN can only provide the first 2 (leaving the initiation of treatment to the primary care provider). The FLS nurse(s) will work according to pre-agreed protocols within the particular institution, with input from a physician with expertise in osteoporosis.

Initially, **Type B (2i) models** of FLS could be established in all centres in the province with the future intention of enhancing these models to undertake initiation of osteoporosis treatment and so become a **Type A (3i) model** in accordance with Osteoporosis Canada’s recommendation. A Type B model can be easily expanded to a Type A model within the same infrastructure. There may also be hybrid models that combine both NPs and RNs that may prove to be more cost-effective (the lower costing RNs could do the work for identification and investigation, leaving the higher costing NPs to deliver initiation).

4. Enhancement of an intervention based on electronic patient identification at the provincial level

A provincial administrative database has been shown to be able to identify all women and men aged 50 years or over who had suffered a fracture of the hip, spine, humerus or forearm by Manitoba Health⁵. This

Figure 3. Expansion of province-wide secondary prevention strategies based on fracture type



Type C (1i) model, and an associated formal cost-effectiveness analysis⁶, is described in detail in Appendix D. FLS coordinators could enable BMD investigation of all fracture patients identified through this electronic mechanism and in doing so, develop this approach to become a **Type B (2i) model**. This strategy could work for any province which has administrative databases that would be sufficiently comprehensive to identify all patients who have suffered fragility fractures.

5. Case finding for vertebral fracture through Diagnostic Imaging

The overwhelming majority of non-vertebral fragility fractures result in the sufferer presenting to urgent care services. However, vertebral fractures often do not come to clinical attention, or when they do, are not recognised and acted upon in terms of osteoporosis assessment and treatment⁷⁻⁹. This is important because vertebral fractures - including those that do not cause acute symptoms - are associated with a 2- to 5-fold increase in future fracture risk and a range of other adverse effects including physical deformity, height loss, chronic pain, reduced quality of life and increased morbidity and mortality¹⁰⁻¹².

A significant number of individuals undergo diagnostic imaging in hospitals for conditions other than osteoporosis. This presents an opportunity for case-finding of vertebral fractures. Such an innovative approach was studied in Edmonton, Alberta¹³. This intervention sought to improve quality of osteoporosis care for older patients who had vertebral fractures identified **incidentally** on chest radiographs, which were taken for clinical reasons **other** than osteoporosis, and

is described in detail in Appendix D. A subsequent formal cost-effectiveness analysis demonstrated that significant cost savings could be achieved with this pragmatic and inexpensive intervention¹⁴.

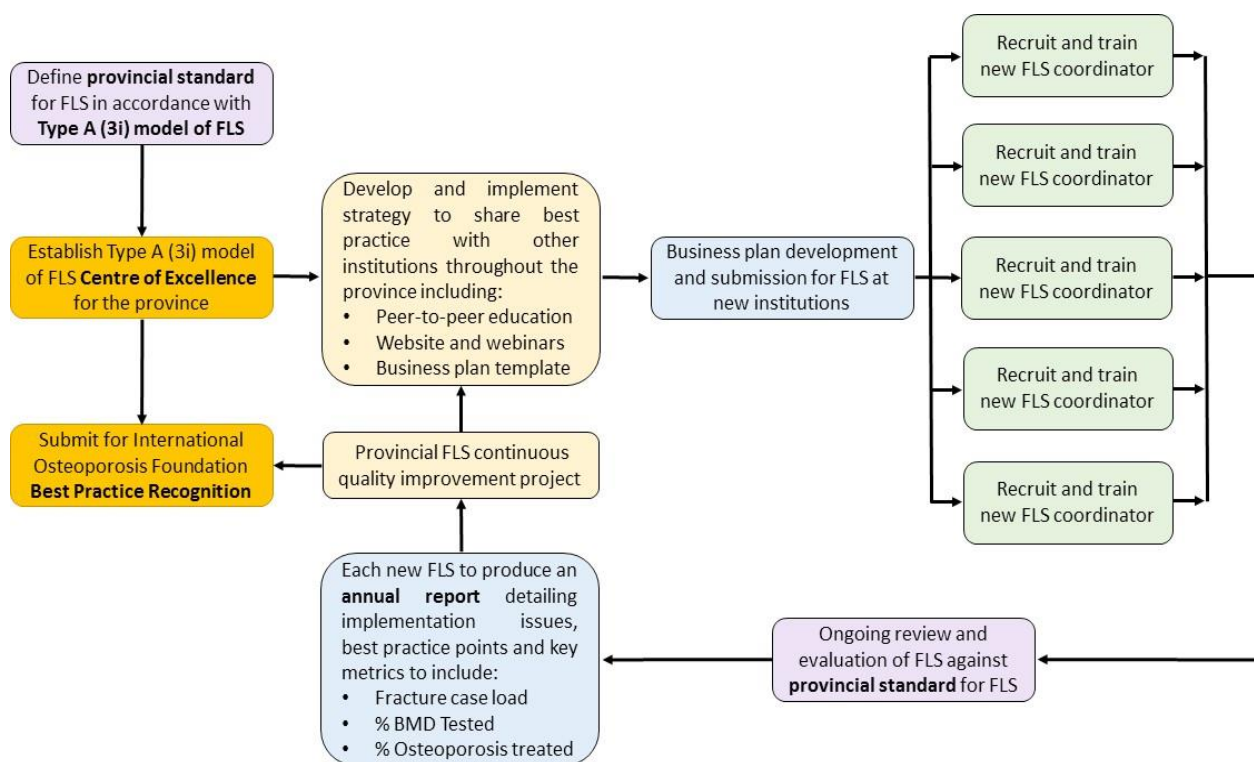
Similar strategies to improve case-finding of vertebral fractures elsewhere in the world were summarised in a recent review on FLS¹⁵. These included analysis of digitalized chest radiographs in Taiwan¹⁶, reformatting data from computed tomography (CT) examinations of the chest or abdomen in New Zealand¹⁷ and expert evaluation of magnetic resonance images (MRI) used for detection of breast cancer in Italy¹⁸.

By putting robust systems in place, incidental discovery of previously unknown vertebral fractures provides an opportunity to identify some of the 'occult' fracture population.

6. A province-wide Type A (3i) FLS model

The most rapid approach to achieve maximum health gains for patients and reduced costs for the healthcare system would be to implement the **Type A (3i) model** of FLS in all localities from the outset.

Figure 4. Centre of Excellence-led strategy for province wide FLS implementation



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