**Appendix E**

**Generic Fracture Liaison Service business plan template**

**Executive Summary**

**Fracture Liaison Services improve quality of care and save costs by reducing unscheduled emergency admissions for hip fractures and the incidence of other fragility fractures**

* **XXX** patients from [**Insert locality/healthcare system**] presented with a hip fracture to [**Insert hospital(s)/facility**] in the year **20ZZ** incurring an annual cost of **$(Y)Y,YYY,YYY.**
* Half of hip fracture patients have already suffered a previous fracture of their other hip, wrist, humerus or other skeletal sites prior to breaking their hip1-4.
* Approved osteoporosis treatments have the potential to halve the incidence of secondary hip fracture if they are initiated when patients present with their first fragility fracture5-14.
* National guidance in Canada calls for routine assessment and osteoporosis treatment, where appropriate, for patients that have suffered fragility fractures15.
* Numerous surveys conducted in Canada at the national level16, 17, provincial level18-24, and in individual organizations25-35 have documented a significant and persistent post-fracture osteoporosis care gap across Canada which has also been reported throughout the world36-39:
	+ **80% of Canadian fragility fracture patients do not receive osteoporosis assessment and/or treatment after their fracture**
* Fracture Liaison Services (3i models) are endorsed by Osteoporosis Canada as the optimal model of care to eliminate the post-fracture osteoporosis care gap by ensuring that all fragility fracture sufferers receive the secondary preventive care they need40
* Fracture Liaison Services (FLS) have also been recognised by the U.S. Surgeon General41, the American Orthopaedic Association42, 43, the American Academy of Orthopaedic Surgeons44, the American Society for Bone and Mineral Research45, the National Osteoporosis Foundation and the National Bone Health Alliance46 in the United States, the International Osteoporosis Foundation36, 37 and analogous groups throughout the world47-56, as the best model to reduce the incidence of painful, debilitating and costly secondary fractures
* Successful FLS programs have been established in Canada57-63, the United States42, 43, 64-69 and many other countries70-91 which have substantially reduced the incidence of hip and other fragility fractures and significantly reduced associated costs
* [**Insert name of hospital(s)/facility**] does not have a FLS program as of [**MM-DD-YYYY**]
* Implementation of a FLS program at [**Insert name of hospital(s)/facility**] could prevent **XYZ** hip fractures over a **X** year period resulting in **$UUU,UUU** savings
* These estimates are conservative because FLS will also reduce the incidence of fractures caused by osteoporosis at skeletal sites other than the hip

**This business plan makes the case for *urgent* implementation of a Fracture Liaison Service, structured in accordance with successful models from elsewhere. This will reduce the incidence of hip and other fractures caused by osteoporosis amongst the elderly and will reduce healthcare costs**

**The need for a Fracture Liaison Service in [Insert locality/healthcare system]**

**The human and economic burden of osteoporosis in Canada**

Canada is entering a period of rapid ageing. By 2031 almost a quarter of our population will be seniors as compared to 15% in 201192. Among these, at least 1 in 3 women and 1 in 5 men will suffer a ***fragility fracture*** in their lifetime due to osteoporosis41, 93, 94, which is the most common chronic bone disease95. A fragility fracture is one occurring spontaneously or following minor trauma such as a fall from standing height or less45. These usually occur at the hip, wrist, upper arm, pelvis or spine. Hip fractures are the most devastating of all fragility fractures. About 30,000 Canadians break their hip every year96. Of these, 28% of women and 37% of men will die within the first year after fracture97. The rest will experience a significant reduction in their quality of life98-100.

The total number of fragility fractures occurring in Canada is of the order 200,000 cases per year among women and men96, 101. To put this in context, for women, this considerably exceeds the combined number of heart attacks, strokes and new diagnoses of breast cancer annually (figure 1)96, 101-103.

Figure 1. Incidence of osteoporotic fracture, heart attack, stroke and breast cancer in Canadian women96, 101-103

**Half of hip fracture patients warn us they are coming: *Fracture begets fracture***

Individuals who suffer a fragility fracture are at substantially increased risk of suffering second and subsequent fractures. Crucially, half of patients who suffer a hip fracture had previously broken another bone – a ‘*signal*’ fracture – before breaking their hip1-4. In other words, half of hip fracture patients had already warned us they were coming when they had their signal fracture. These data indicate the major opportunity afforded by secondary fracture prevention strategies. By responding to the first fracture, we can reduce the incidence of second and subsequent fractures, particularly of the hip36, 45, 46, 104. It is self-evident that every fracture which occurred before the hip fracture in figure 2 – every signal fracture – created an opportunity for osteoporosis assessment. Each time this opportunity was missed, the patient was left needlessly at risk and continued to suffer subsequent fractures until finally devastated by a hip fracture.

Figure 2. Osteoporosis and fragility fractures throughout the life course53



**Osteoporosis treatments can halve secondary fracture incidence**

A broad choice of medicines are available to treat osteoporosis which can be taken as daily5, 7-11, weekly105, 106 or monthly tablets107, or as daily12, semi-annual6 or annual injections13, 14. These agents have been shown to reduce the incidence of fractures by 30-50%. Fracture reduction efficacy of 50% has been observed for patients with a history of multiple fractures108. A growing body of evidence also suggests that osteoporosis treatment is associated with reduced mortality14, 109-112.

**Post-fracture osteoporosis care: A nationwide care gap**

Numerous surveys conducted in Canada at the national level16, 17, provincial level18-24, and in individual organizations25-35 have reported a significant and persistent secondary fracture prevention care gap. A significant body of work has been undertaken in Canada and internationally to understand why the post-fracture osteoporosis care gap exists and how it can be eliminated38, 39, 113-118. Put simply, there is a disconnect between the management of the fracture, usually by orthopaedic services, and recognition and management of the underlying osteoporosis (BMD testing and/or osteoporosis treatment) as follows119:

* The fracture is treated as an acute event by the orthopaedic surgeon or emergency physician who provide the best of immediate care for the fracture.
* The patient also treats their fracture as an acute event as he or she is unaware of his or her bone fragility/failure (a man who suffers a heart attack from shovelling snow blames his heart, not the snow bank – but a patient who breaks his/her wrist from a simple fall blames the floor).
* Thus, the opportunity for post-fracture intervention is missed.

**Fracture Liaison Services:**

**A proven system to eliminate the post-fracture osteoporosis care gap**

**The Fracture Liaison Service (FLS) model of care has been shown within Canada57-63, the United States42, 43, 64-69 and many other countries70-91 to eliminate the post-fracture osteoporosis care gap, reducing the incidence of repeat fractures and resulting in significant cost savings. Osteoporosis Canada calls for implementation of FLS across all Canadian provinces as a matter of urgency.**

In 2011, Canadian investigators undertook a systematic review describing clinical models intended to close the post-fracture osteoporosis care gap120. Sixty-five percent of the world’s literature described the critical role of dedicated personnel to proactively identify patients, to facilitate BMD testing and to initiate osteoporosis treatment. These service models have been referred to by a range of terms. In accordance with major international post-fracture care initiatives, this document will use the term Fracture Liaison Service (FLS)36, 37, 45, 104, 121, 122.

The main objectives of a Fracture Liaison Service (FLS) include:

* **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 2010 Osteoporosis Canada Guidelines15, 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 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.

In 2013, investigators from Australia published a systematic review and meta-analysis on post-fracture models of care which provides a useful framework for classification116. Models of varying intensity were classified as Types A to D, the description and outcomes for which are summarised in ***Make the FIRST break the LAST with Fracture Liaison Services*** and associated Appendices C and D.

**A Fracture Liaison Service (3i model) to identify, investigate, and initiate appropriate osteoporosis treatment must be the standard of care across Canada. Osteoporosis Canada urges all jurisdictions to implement FLS by 2015**.

A Type B model (2i) 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).

[**The business plan authors may choose to make reference to the examples of successful FLS within Canada and leading international models referenced below**]

**Toronto:** The Osteoporosis Exemplary Care Program at St. Michael’s Hospital in Toronto established that a hospital which hired an FLS coordinator who manages 500 patients with fragility fractures annually could **reduce the number of secondary hip fractures by 9% in the first year**, with net hospital cost savings of $48,950 (2004 dollars)60, 61. Greater savings were anticipated after the first year and when additional costs such as rehabilitation and dependency costs are considered.

**Edmonton:** A formal health-economic evaluation of a coordinator to improve osteoporosis treatment after hip fracture found that for every 100 patients assessed, 6 fractures (including 4 hip fractures) were prevented, 4 quality-adjusted life years were gained, and $260,000 (2006 Canadian dollars) was saved by the healthcare system58, 59. The **intervention cost was just $56 per patient** and the intervention would break even within two years. A similar analysis which evaluated a nurse coordinating management after wrist fracture reported a cost per patient of $4457, 123.

**Australia:** Seibel MJ, Lih A, Nandapalan H et al. Targeted intervention reduces refracture rates in patients with incident non-vertebral osteoporotic fractures: a 4-year prospective controlled study. *Osteoporosis International*. 2011 Mar;22(3):849-858. [PubMed ID 21107534](http://www.ncbi.nlm.nih.gov/pubmed/21107534)

**United Kingdom:** McLellan A, Gallacher S, Fraser M et al.The fracture liaison service: success of a program for the evaluation and management of patients with osteoporotic fracture. *Osteoporosis International*. 2003;14(12):1028-1034. [PubMed ID 14600804](http://www.ncbi.nlm.nih.gov/pubmed/14600804)

**United States:** Fracture prevention in Kaiser Permanente Southern California. Dell R. Osteoporos Int. 2011 Aug;22 Suppl 3:457-460. [PubMed 21847765](http://www.ncbi.nlm.nih.gov/pubmed/21847765)

**[Insert hospital(s)/facility]** does not have a FLS program as of **[MM-DD-YYYY]**.

**A Fracture Liaison Service for [Insert hospital(s)/facility]**

**This business plan makes the case for urgent implementation of a Fracture Liaison Service in [Insert hospital(s)/facility]**, structured in accordance with successful models from elsewhere, to reduce the incidence of hip and other fractures caused by osteoporosis amongst our elderly population.

**Aim:** The aim of the proposed Fracture Liaison Service (FLS) program is to ensure that all patients age 50 and over presenting to urgent care services with fractures caused by osteoporosis receive assessment and treatment, where appropriate, for osteoporosis and referral to local falls prevention services to reduce their risk of subsequent fractures.

**Current provision:** An assessment of current service provision sets a context for funders to consider the merits of the business plan.

**Service model:** The FLS program will be structured in accordance with successful models from elsewhere.

Insert local data on the total number of hip fracture admissions and non-hip fragility fracture patients managed as in-patients and out-patients respectively. Consider producing a table as indicated below:



Provide local costs associated with hospital, primary care and any publicly funded residential/nursing home admissions related to these fractures.

Provide a comprehensive breakdown of all costs pertaining to delivery of the FLS in your province/locality/institution. In addition to Osteoporosis Canada’s ***Make the FIRST break the LAST***

***with Fracture Liaison Services*** document and associated appendices, several international initiatives provide practical resources which can support development of this component of the business plan:

**American Society for Bone and Mineral Research**

Eisman JA, Bogoch ER, Dell R et al. Making the first fracture the last fracture: ASBMR task force report on secondary fracture prevention. J Bone Miner Res. 2012 Oct;27(10):2039-2046. [PubMed ID 22836222](http://www.ncbi.nlm.nih.gov/pubmed/22836222)

Appendix A is recommended reading and available under Supporting Information at: <http://onlinelibrary.wiley.com/doi/10.1002/jbmr.1698/abstract>

**International Osteoporosis Foundation**

Capture the Fracture Campaign and Best Practice Framework

Akesson K, Marsh D, Mitchell PJ et al. Capture the Fracture: a Best Practice Framework and global campaign to break the fragility fracture cycle. Osteoporos Int. 2013 Apr 16. [Epub ahead of print]. [PubMed ID 23589162](http://www.ncbi.nlm.nih.gov/pubmed/23589162)

The Capture the Fracture Campaign website is also recommended reading at: <http://www.capturethefracture.org/>

**National Bone Health Alliance (United States)**

The National Bone Health Alliance in the United States has developed the Fracture Prevention CENTRAL website to promote the widespread implementation of post-fracture prevention and care coordination programs:

<http://www.nbha.org/fpc>

**Glasgow Fracture Liaison Service, Scotland UK**

The publication of a formal cost-effectiveness model for the Glasgow FLS in Scotland, UK can serve as a useful check-list to consider what elements should be taken into account by those planning implementation of FLS. See table 1 of the Glasgow FLS formal cost-effectiveness publication:

McLellan AR, Wolowacz SE, Zimovetz EA et al. Fracture liaison services for the evaluation and management of patients with osteoporotic fracture: a cost-effectiveness evaluation based on data collected over 8 years of service provision. Osteoporos Int. 2011 Jul;22(7):2083-2098. [PubMed ID 21607809](http://www.ncbi.nlm.nih.gov/pubmed/21607809)

**Summary**

Hip fractures exert a substantial toll on our local elderly population and on our healthcare budgets. Half of hip fracture patients had already warned us they were coming because they suffered prior fractures caused by osteoporosis that could and should have served as a trigger for secondary preventive care.

Implementation of a **Fracture Liaison Service** in **[Insert hospital(s)/facility]** will eliminate the post-fracture osteoporosis care gap in our locality. The Fracture Liaison Service will improve the quality of care we give and reduce costs associated with preventable fractures. This business plan recommends implementation of this service as a matter of urgency.

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