OSTEOPOROSIS

Osteoporosis Canada's definition of FLS

A Fracture Liaison Service (FLS) is a specific systems-based model of care for secondary fracture prevention where a dedicated FLS coordinator:

1st i	IDENTIFICATION	systematically and proactively identifies patients aged 50 years and older presenting to a hospital with a new fragility fracture and/or with a newly reported vertebral fracture;
2nd i	INVESTIGATION	organizes appropriate investigations to determine the patient's fracture risk;
3rd i	INITIATION	facilitates the initiation of appropriate osteoporosis medications for high-risk patients where pharmacotherapy is recommended.

FLS has outperformed all other post-fracture osteoporosis interventions in terms of significantly improved patient outcomes and reduction in healthcare costs[1-3]. Other key components of FLS are listed in Osteoporosis Canada's Essential Elements of FLS.

Essential Elements of FLS

1	DEDICATED FLS COORDINATOR
2	IDENTIFICATION
3	INVESTIGATION
4	INITIATION OF TREATMENT
5	FALLS PREVENTION & NON-PHARMACOLOGIC INTERVENTIONS
6	MONITORING OF THE PATIENT
7	INTEGRATION WITH PRIMARY CARE
8	MONITORING OF FLS PERFORMANCE

For further details on the Essential Elements, see the Technical Parameters.

FLS, as described in this document, consistently demonstrates a meaningful improvement in the post-fracture care gap, typically improving the rate of appropriate osteoporosis treatment at least two-fold.

FLS has outperformed all other post-fracture interventions leading to a significant reduction in secondary fractures and their associated healthcare costs.[1-5]

Post-fracture care models that do not meet the above definition and the Essential Elements have, to date, demonstrated either complete lack of effectiveness in closing the post-fracture care gap or, in the case of 1i models (identification and alert to the Primary Care Provider), only a small improvement in the proportion of patients receiving appropriate osteoporosis treatment.

The FLS Registry Committee recognizes that new research is ongoing and welcomes submissions to the FLS Registry from innovative post-fracture care models that may not meet all of the current Osteoporosis Canada (OC) Essential Elements of FLS, provided:

a) the model has been in operation for at least one full year AND
b) the model demonstrates it is effective based on OC's core FLS Key Performance Indicators (KPIs).

1. Sale JE, et al. Systematic review on interventions to improve osteoporosis investigation and treatment in fragility fracture patients. Osteoporos Int. 2011
2. Ganda K, et al. Models of care for the secondary prevention of osteoporotic fractures: a systematic review and meta-analysis. Osteoporos Int. 2012
3. Barton DW, et al. The clinical impact of Fracture Liaison Services: a systematic review. Geriatr Orthop Surg Rehabil. 2021
4. Wu CH, et al. Economic impact and cost-effectiveness of fracture liaison services: a systematic review of the literature. Osteoporosis Intl. 2018
5. Wu CH, et al. Fracture liaison services improve outcomes of patients with osteoporosis-related fractures: A systematic literature review and meta-analysis. Bone. 2018 June

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Technical Parameters of Osteoporosis Canada's Essential Elements of FLS		
1	DEDICATED FLS COORDINATOR	a. The FLS coordinator must be either exclusively dedicated to FLS functions or have specified protected/dedicated time allocated to exclusively perform the FLS functions. b. The FLS coordinator position must be resourced sufficiently so as to be able to reach at least 50% of the fracture patients presenting to the FLS's specific clinical setting at the hospital or other appropriate healthcare institution (orthopaedic inpatients, orthopaedic outpatients, or both, depending on the type of FLS). c. The FLS coordinator provides education to patients throughout their journey in the FLS.
2	IDENTIFICATION: systematically and proactively identifies patients aged 50 years and older presenting to a hospital with a new fragility fracture and/or with a newly reported vertebral fracture	a. For inpatient-only FLSs, the systematic and proactive case finding must be in the hospital's orthopaedic wards or from an equivalent administrative database. This type of FLS must enroll hip fracture patients. Enrollment of other admitted major osteoporotic fractures (e.g. wrist, shoulder, spine and pelvis) is strongly encouraged. The latter patients may be admitted to other medical wards. b. For outpatient-only FLSs, the systematic and proactive case finding must be in the hospital's/institution's orthopaedic clinics or from an equivalent administrative database. This type of FLS must enroll wrist, shoulder and pelvic fracture patients. Enrollment of hip and spine fracture patients seen in those clinics is also strongly encouraged. c. For combined inpatient/outpatient FLSs, the systematic and proactive case finding must be from both the hospital's orthopaedic wards AND the outpatient orthopaedic clinics. This type of FLS must enroll the following types of fracture patients: hip, wrist, shoulder and pelvis. Enrollment of spine fracture patients is also strongly encouraged. d. Spine fracture FLSs are much more complex to implement and there is currently no evidence of clinical effectiveness of such models. Osteoporosis Canada strongly recommends that such FLSs not be contemplated until the hospital already has a well-established combined inpatient/outpatient FLS and has ensured it is effective. For a spine fracture FLS, the systematic and proactive case finding must be done directly within the Diagnostic Imaging (DI) Department and must be accessible to all patients presenting with certain DI studies (e.g. all CT scans to include CT scans of chest, abdomen and/or spine). Such models must demonstrate that they do an adequate history and review of prior spine imaging to exclude prior traumatic spine fractures (which will remain present permanently on DI studies done following the fracture).
3	INVESTIGATION: organizes appropriate investigations to determine the patient's fracture risk	a. The FLS itself should determine the patient's fracture risk as it is most familiar with the patient's clinical risk factors. Relying exclusively on the BMD report's fracture risk categorization will be an acceptable but inferior option. b. A validated fracture risk assessment tool recommended by OC Clinical Practice Guidelines must be used. FRAX with BMD is the preferred option as it has been shown to be the most accurate tool (compared to FRAX without BMD or CAROC), especially in patients with recent fragility fracture. FRAX without BMD is acceptable where local conditions mandate or where a patient is unable to obtain a valid BMD assessment. c. For spine FLSs, the fracture risk determination cannot be completed without history from the patient (to ascertain history of prior high impact trauma that could account for the newly identified vertebral fracture). Flexibility will be allowed for such models as provincial privacy legislation may only allow the FLS to send out an alert letter to the primary care physician. All such models will undergo a joint review by the FLS Registry Committee and the FLS Audit Committee, to determine their status in regard to inclusion in the OC FLS Registry. The above notwithstanding, all FLSs are strongly encouraged to perform the following investigations: i. BMD testing. If not required for fracture risk determination, a new baseline BMD (if not recently done) will likely prove useful in the ongoing monitoring of the patient. ii. Lab testing, to ensure it will be safe to initiate osteoporosis treatment and to exclude potential secondary causes of osteoporosis/bone fragility.

		iii. Spine x-rays may be useful to more accurately assess a patient's fracture risk and are therefore strongly recommended for patients where it may make a difference in their risk scoring. New baseline spine x-rays may also prove useful in ongoing monitoring of the patient.
4	INITIATION OF TREATMENT	Facilitates the initiation of appropriate osteoporosis medications based on patients' fracture risk score: a. For 3i FLSs, the model itself must initiate the osteoporosis treatment. For 2i FLSs, there must be a communication to the patient's primary care provider with a clearly worded recommendation to initiate osteoporosis treatment. b. For patients already on osteoporosis treatment, there must be an osteoporosis medication review.
5	FALL PREVENTION & NON-PHARMACOLOGIC INTERVENTIONS	Fall prevention for at-risk patients, in partnership with local fall prevention programs, to include: a. A fall risk screening on all patients. b. Referral for all at-risk patients: i. To a local fall prevention program if one is available locally. ii. In the absence of any local fall prevention programs, an alert letter should be sent to the PCP for all patients deemed to be at significant risk for falling. The FLS will provide information on other non-pharmacologic interventions (such as lifestyle, exercise and nutrition) where appropriate.
6	MONITORING OF PATIENTS RECOMMENDED TO START PHARMACOTHERAPY	Monitoring of patients recommended to start pharmacotherapy will include the following: a. For patients on oral bisphosphonates, must include at least one assessment of the patient (in person or by phone) to ensure they are taking their medication in a safe and effective manner. Typically, this would occur approximately 1-4 months post-fracture. b. Irrespective of the pharmacotherapy initiated, there needs to be an assessment of persistence 52 weeks post-fracture. Persistence may be assessed using an administrative database. *If resources allow, it is strongly recommended for FLSs to monitor future fragility fractures. Follow-up of > one year is needed to demonstrate a significant decrease in future fractures.*
7	INTEGRATION WITH PRIMARY CARE	The FLS shall communicate directly with the patient's primary care provider (PCP), and must include the following information: a. For all patients: i. Results of investigations conducted by the FLS (PCP could be copied on results) ii. The patient's fracture risk score as determined by the FLS. A BMD report alone shall not satisfy this criterium. iii. All treatment recommendations and referrals iv. A clear transfer of care communication at the end of the FLS's follow-up period b. For those patients recommended to start on pharmacotherapy: i. Osteoporosis medications initiated or recommended ii. Alert to PCP regarding any patients who are not adherent/persistent with their prescribed osteoporosis medication upon follow-up.
8	MONITORING OF FLS PERFORMANCE, to ensure the model is clinically effective	a. For non-Ontario Osteoporosis Strategy (OOS) FLSs: the FLS must participate in OC's national FLS audits. b. For OOS sites: the OOS will continue to conduct regular evaluations of its FLSs. The OOS will provide OC with aggregate data on their FLS sites, collected as part of the regular evaluation process, at least once in any Registry renewal period. *Where resources allow, demonstrating an FLS's cost-effectiveness is also recommended as it will support sustainability of the model.*