

Key performance indicators (KPIs) for Canadian FLSs v2.0:

setting the foundation for reflective practice and improvement for FLSs

 **OSTEOPOROSIS**

 **Make the
FIRST break
the LAST**
FRACTURE LIAISON SERVICES

Broken bones from osteoporosis are more common than heart attack, stroke and breast cancer combined.



Table of contents

- 3** Executive summary
- 4** Glossary of terms as used in this document
- 6** The need for consistent and comparable indicators for FLSs
- 8** Development of OC's FLS KPIs
- 9** Core KPIs (essential)
- 12** Supplementary KPIs
(strongly recommended for FLSs with sufficient resources)
- 14** Interpretation of FLS KPIs
- 16** What Canada needs now!
- 17** Acknowledgements
- 18** Appendix: Osteoporosis Canada's Essential Elements of Fracture Liaison Services (FLS)
- 19** References

Executive summary

Fractures beget fractures. A huge post-fracture care gap exists: less than 20% of fragility fracture patients ever receive the osteoporosis care they need to prevent their next fracture¹⁻⁵. These patients are trapped in a cycle of recurrent and costly fractures.

Although many interventions have been attempted nationally and internationally over the last two decades, only Fracture Liaison Services* (FLS) have been able to show a very meaningful reduction in the post-fracture care gap⁶⁻¹⁴, the incidence of repeat fractures^{7,8,15-17}, mortality^{8,16}, and utilization/costs of healthcare resources^{7,13,17-22}.

To be effective, an FLS must first and foremost have the right processes in place (see the Essential elements of FLSs*). One of these crucial processes is the ability of the FLS to monitor its own effectiveness.

The key performance indicators (KPIs)* presented in this document will be a useful guide for Canadian FLSs. The FLS KPIs provide:

- A way to measure the performance of the FLS at the level of the system
- A useful tool to facilitate on-going continuous quality improvement through Plan-Do-Study-Act (PDSA) methodology* to address any identified care gaps
- The ability for FLSs to compare their performance with that of other FLSs from across Canada

“Appreciated thoroughness of bone assessment, education package, time that FLS nurse spent with me and my family to answer all our questions.

Patient with fracture
White Rock, BC

The more experienced and established an FLS is, the better the patient outcomes will be, but the KPIs will set up all FLSs for a much faster path to success.

Osteoporosis Canada’s (OC) goal is to help ensure that no fracture patient is ever “left behind” and that each of them will receive the osteoporosis care they need to prevent their next fracture. OC’s FLS KPIs are a crucial part of this endeavour.

*these terms are further defined in the Glossary.

“It was a real mess before FLS. The care was fragmented between ortho, x-ray, emergency and inpatients. There was no one person to connect all the dots together to make the assessment happen. Almost invariably the patients fell between the cracks and never received the treatment they needed to prevent their next fracture.

Ken Cameron
Family physician, Dartmouth, NS



NORMAL



OSTEOPOROSIS

Broken bones can be warning signs of osteoporosis.

Let’s make their FIRST break their LAST!

Glossary of terms as used in this document

Fracture Liaison Service:

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

- 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
- INVESTIGATION** • organizes appropriate investigations to determine the patient's fracture risk
- INITIATION** • facilitates the initiation of appropriate osteoporosis medications

FLS has outperformed all other post-fracture osteoporosis interventions in terms of significant patient outcomes and reduction in healthcare costs⁶⁻⁸.

The “3i’s”:

Identification, **Investigation** and **Initiation** of treatment are often referred to as the “3i’s” of FLS, with identification being the first i, investigation the second i and initiation the third i.

Adherence:

The extent to which a person takes medications as prescribed by their health care provider. For osteoporosis medications, this can be complex depending on the type of and/or frequency of dosing of the specific medication and may include:

- The percentage of the prescribed doses actually taken by the patient over a specified period of time
- The timing of the next dose of medication taken (especially for medications with a very long dosing interval, e.g. once a year)
- Taking the medication in the correct manner, e.g. on an empty stomach, etc.

For the purposes of this document which is aimed at PDSA methodology, the KPI for adherence will measure the proportion of patients who are adherent at a set time.

CAROC

A tool to determine fracture risk jointly endorsed by the **C**anadian **A**ssociation of **R**adiologists and **O**steoporosis **C**anada. CAROC incorporates 5 risk factors: age, sex, prior fragility fractures, glucocorticoid use and bone density measurement. CAROC has been validated in the Canadian population²³. To access the CAROC tool, go to <http://www.osteoporosis.ca/multimedia/FractureRiskTool/index.html#/Home>.

Essential elements of Fracture Liaison Services:

The *Essential elements* were defined by Osteoporosis Canada in September 2015. They are deemed the bare minimum processes necessary to ensure that an FLS will be set up for success, particularly in its ability to have a meaningful impact on the post-fracture care gap at the level of the system. For the complete list of the *Essential elements*, please see Appendix.

First-line osteoporosis medications:

First-line osteoporosis medications in this document are defined as per the 2010 Osteoporosis Canada Clinical Practice Guidelines²⁴ and include alendronate, risedronate, zoledronic acid, denosumab, raloxifene, estrogen and teriparatide.

Fragility fracture:

A fragility fracture is a fracture occurring spontaneously or following minor trauma such as a fall from standing height or less. In this document, we focus on those fragility fractures recommended for surveillance by the Canadian Chronic Disease Surveillance System (CCDSS) Osteoporosis Working Group of the Public Health Agency of Canada (PHAC)²⁵: hip, wrist, shoulder, spine and pelvis.

Excluded from the definition of fragility fracture: traumatic fractures, stress fractures, pathologic fractures, peri-prosthetic fractures, avulsion fractures and atypical femoral fractures (complete or incomplete).

FRAX

A tool to determine fracture risk endorsed by Osteoporosis Canada. FRAX is a computer-driven tool that incorporates many risk factors including age, sex, BMI (Body Mass Index), prior fragility fracture, parental history of a hip fracture, current smoking, high alcohol intake, glucocorticoid use, rheumatoid arthritis and other secondary causes. FRAX can be computed with or without inclusion of a BMD (Bone Mineral Density) measurement. FRAX has been validated in the Canadian population²⁶⁻²⁸. To access the Canadian FRAX tool, go to <https://www.sheffield.ac.uk/FRAX/tool.aspx?country=19>.

Key performance indicators (KPIs) for FLSs:

FLS KPIs are sub-classified in this document as “core” or “supplementary”. In this document, the term “KPI” will refer to all of the FLS KPIs unless specifically identified as either “core” or “supplementary”.

The **core** KPIs are deemed absolutely essential. They are kept to an absolute minimum so as to lessen as much as possible the demands on FLS staff’s time in collecting and recording the data required to measure and monitor such indicators.

Supplementary KPIs are also provided and are strongly recommended for FLSs with sufficient resources. Some FLSs may choose to monitor some, but not all of the supplementary indicators.

For the first few national FLS audits, Osteoporosis Canada will focus almost exclusively on the core KPIs.

Persistence:

The act of continuing the treatment for the prescribed length of time. For the purposes of this document which is aimed at PDSA methodology, the KPIs for persistence will measure the proportion of patients who remain persistent at a set time.

Plan-Do-Study-Act (PDSA) methodology:

Making use of the Institute for Health Improvement (www.ihl.org) framework for quality improvement, this document has developed FLS indicators intended to be used in PDSA cycles. PDSA methodology is a simple yet powerful tool for accelerating quality improvement. The steps in the PDSA cycle are:

- Step 1: Plan - Plan a change or modification of practice, including a plan for collecting data
- Step 2: Do - Try out the change/modification on a small scale or over a short duration
- Step 3: Study - Analyze the data and the results
- Step 4: Act - Refine the model, based on what was learned from Step 3

Point of care

In the context of this document, point of care refers to FLS care provided at the time and place of the patient’s orthopaedic care. The driving notion behind point of care is to bring the FLS care immediately and conveniently to the patient. This is an important enabler for FLSs.

The need for consistent and comparable indicators for FLSs

Without FLS, less than 20% of fragility fracture patients ever receive the osteoporosis care they need to prevent their next fracture¹⁻⁵. Indeed, recent studies have demonstrated that the post-fracture care gap has worsened in the past few years^{4,5}, in all likelihood partly as a result of media-driven over-blown fears of the very rare risks posed by osteoporosis medications.

28% of women and 37% of men who suffer a hip fracture will die within the following year.

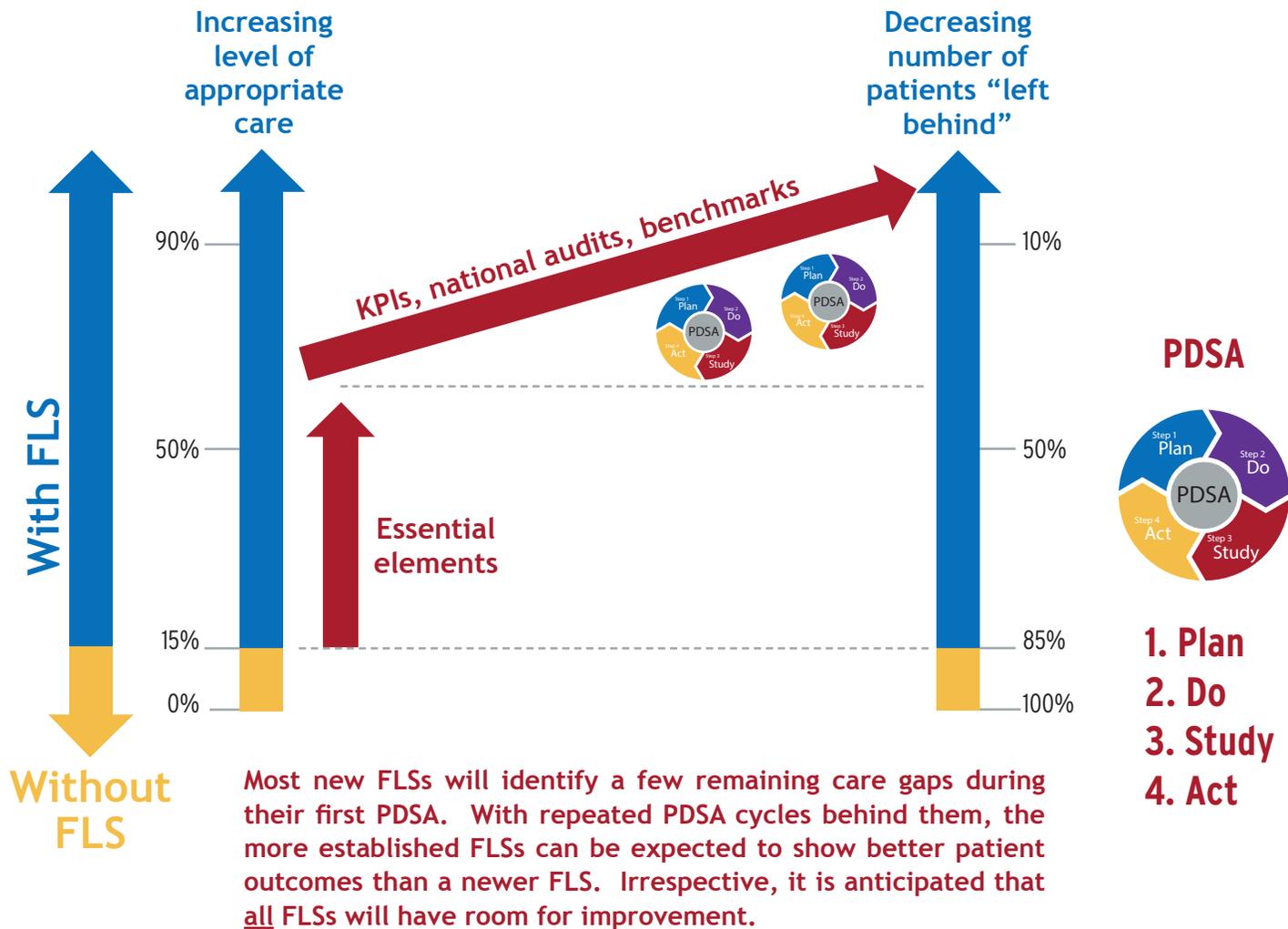
Preventing that next fracture for fragility fracture patients necessitates that the following three indispensable steps are achieved:

1. The FLS must **identify**/capture the fragility fracture patients for their entire catchment/healthcare system.
2. Each fragility fracture patient must be **investigated**/assessed to determine his/her fracture risk.
3. Patients determined to be at higher risk for subsequent fractures must be **initiated** on effective osteoporosis medication.

An FLS meeting Osteoporosis Canada's *8 Essential elements* (for more details, see the Appendix) will dramatically reduce the post-fracture care gap, yet will still be only part way to fully closing it. No FLS will be perfect and, even with the best of intentions and resources, some fracture patients, possibly many, will inadvertently be "left behind" at each of the above three steps.

Evaluating the FLS's performance is crucial in order to identify the FLS's weaknesses, and hence any areas for improvement. A database is an absolute necessity for continuous quality improvement of the FLS through a process of Plan-Do-Study-Act (PDSA) within a culture of ongoing reflection and improvement of the program. Ability to compare with similar FLS programs is an opportunity to learn from others and can be used to improve patient outcomes across programs. With on-going PDSA cycles, FLS processes will be tweaked, internal/external barriers will be removed and patient outcomes will gradually improve. More information on PDSA for FLSs can be found in Appendix H of the OC's FLS Toolkit at <http://fls.osteoporosis.ca/wp-content/uploads/FLS-TOOLKIT-App-H.pdf>.

It should therefore not come as any surprise that FLS performance monitoring is an integral recommendation of all existing national and international FLS Clinical Standards documents²⁹⁻³¹.



The need for national FLS audits

In order to optimize patient outcomes, an FLS must be able to compare its own performance against that of other similar FLSs (e.g. located in a similar setting such as inpatient orthopaedic ward or outpatient orthopaedic clinics). National FLS audits have become mandatory in the United Kingdom where they provide very useful comparative data for the country's FLSs^{32,33}. In New Zealand, FLSs provide quarterly reports on their performance to the Ministry of Health³⁴.

Osteoporosis Canada conducted its first national FLS audit in 2018 (<http://fls.osteoporosis.ca/wp-content/uploads/Report-from-Osteoporosis-Canadas-first-national-FLS-audit.pdf>). We will continue to conduct periodic national FLS audits every two years in order to provide comparative data for Canadian FLSs. Benchmarks to guide FLSs will eventually be established based on these audits.

Development of OC's FLS KPIs

The risk of having a fracture from osteoporosis can be reduced and valuable healthcare dollars saved.

Osteoporosis Canada's KPIs were developed to provide a standardized overview of an FLS's effectiveness for each of the individual 3i's (identification, investigation and initiation of treatment). The KPIs highlight the relative strengths and weaknesses of the FLS at the level of the system for the purpose of on-going continuous quality improvement through a Plan-Do-Study-Act (PDSA) process.

The FLS KPIs were developed by a national committee with representation from each province featured on the OC FLS Registry. The FLS Audit Committee strives to focus on the FLS performance measures deemed most critical to an FLS's success, in keeping with OC's Essential elements, in order to minimize as much as possible the burden imposed on FLS staff's time in collecting and recording the data required to measure and monitor such outcomes.

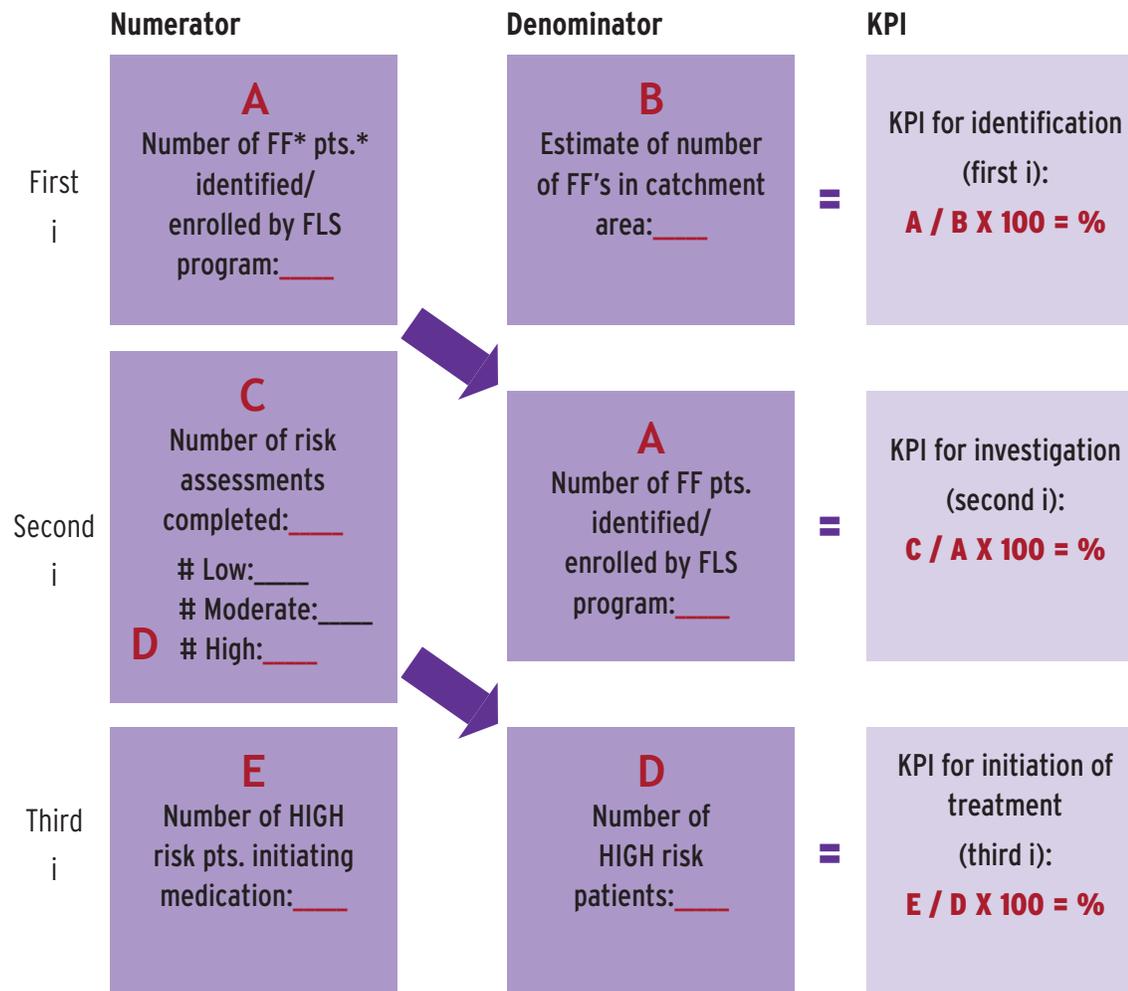
OC's FLS KPIs will be updated from time to time as warranted.

For more information on the development of Osteoporosis Canada's key indicators for Canadian FLSs, go to <http://www.osteoporosis.ca/fls/indicator-development/>.



Core KPI's (essential)

Overview of core FLS indicators



Making the
FIRST break
the LAST is
an achievable
goal through
the widespread
implementation
of FLS.

PLEASE NOTE: The numerators and denominators above MUST comply with the full definitions as described further in this document. Some numerators and denominators may vary depending on patient stream.

* FF stands for "fragility fracture".
Pts stands for patients.

Patient demographics data to be collected

In the interest of keeping the core measurements to an absolute minimum, only age (at time of fracture) and fracture type (hip, wrist, shoulder, pelvis or spine) are considered “core” demographics.

KPI for identification, the “first i”:

The first i will be assessed in 3 different **patient streams**:

- Patients with hip fractures
- Patients with non-hip, non-spine fractures
- Patients with spine fractures (exploratory only).

Please note that any FLS can and should continue using all of their current protocols which may well exceed the recommendations as outlined in this document. The numerators and denominators in this document were selected specifically to optimize comparability/standardization between FLSs across the provinces. For example, an FLS with protocols allowing enrollment of patients less than age 50 or with fracture types other than hip, wrist, shoulder, pelvis and spine, can continue to provide those services. However, the latter patients (those under age 50 and those with other fracture types) should not be included in the numerators or denominators in the context of a national FLS audit.

	Patients with hip fracture	Patients with non-hip, non-spine fracture	Patients with spine fracture (exploratory only)
NUMERATOR^{a,b} A	<p>Number of patients aged 50 and up with a fragility fracture of the hip (proximal femur) enrolled in the FLS:</p> <ul style="list-style-type: none"> - <u>within 6 weeks</u> of the incident fracture for inpatient-only FLSs. - <u>within 12 weeks</u> of the incident fracture for outpatient-only and combined inpatient/outpatient FLSs. - <u>within 26 weeks</u> for inpatient-only/hip-only FLSs without a dedicated FLS coordinator*. 	<p>Number of patients aged 50 and up with a fragility fracture of the shoulder (proximal humerus), wrist (distal radius) or pelvis enrolled in the FLS <u>within 6 weeks</u> of the incident fracture.</p>	<p>Number of patients aged 50 and up with a fragility fracture of the spine (thoracic/lumbar), enrolled in the FLS.</p>
DENOMINATOR^a B	<p>Number of patients admitted/discharged with a hip fracture, from the hospital's administrative database^c X 1.</p>	<p>Number of patients admitted/discharged with a hip fracture, from the hospital's administrative database^c X 1.76.</p>	

* For inpatient-only/hip-only FLSs without a dedicated FLS coordinator, patients will be considered enrolled in the FLS when they are first seen by the osteoporosis specialist.

- The time frame, e.g. 6 months, 1 year, etc, shall be identical for both the numerator and the denominator.
- The above numerators **EXCLUDE**: traumatic fractures, stress fractures, pathologic fractures, peri-prosthetic fractures, avulsion fractures and atypical femoral fractures (complete or incomplete).
- CRITICAL/ESSENTIAL**: The hip fracture numbers to be used in the calculation of this denominator should be at the level of the entire healthcare system for the FLS's catchment area, typically the number of hip fractures admitted to or discharged from the hospital annually. It cannot just be the number of hip fractures captured by the FLS or the number of hip fracture referrals received. Systematic and pro-active case finding is an integral part of the definition of FLS as endorsed by Osteoporosis Canada. A model receiving its patients through a regular referral process therefore does not satisfy OC's definition of FLS.

In some regions, hip fracture surgery is concentrated in a few select hospitals. Osteoporosis Canada will guide the adjustments for the denominator for those FLSs.

In the event that a patient presents with two different acute fractures at the same time (e.g. a hip fracture and a pelvic fracture occurring from the same fall), the patient will be classified as follows:

- In inpatient-only and combined inpatient/outpatient FLSs, patient presenting with a hip + any other fracture: classify as a hip fracture
- In an outpatient-only FLS, patient presenting with a non-hip, non-spine fracture + any other fracture: classify as a non-hip, non-spine fracture
- In a combined FLS, patient presenting with a non-hip, non-spine fracture and a spine fracture: classify as a non-hip, non-spine fracture.

KPI for investigation, the “second i”:

NUMERATOR C	Of the below denominator, number of patients aged 50 and up with a fragility fracture of the hip (proximal femur), shoulder (proximal humerus), wrist (distal radius) or pelvis who have a fracture risk completed by a validated fracture risk assessment tool (FRAX with or without BMD or CAROC) <u>within 26 weeks</u> of the incident fracture. Separately provide the number of patients in the above who were deemed HIGH RISK. D
DENOMINATOR A	Number of patients aged 50 and up with a fragility fracture of the hip (proximal femur), shoulder (proximal humerus), wrist (distal radial) or pelvis enrolled in the FLS as per the numerators for the first i.



**At least
1 in 3
women and
1 in 5 men
will suffer
a broken
bone from
osteoporosis
in their
lifetime.**

KPI for initiation of treatment, the “third i”:

NUMERATOR E	Of the below denominator, number of HIGH RISK patients initiated ^a and/or still on a first-line osteoporosis medication <u>within 26 weeks</u> of the incident fracture.
DENOMINATOR D	Number of HIGH RISK patients (after determination of fracture risk by a validated fracture risk determination tool such as FRAX with or without BMD or CAROC) <u>within 26 weeks</u> of the incident fracture.

- a. Initiation may be ascertained by one of the following methods:
- FLS providing the prescription to the patient directly.
 - Patient self-report of treatment initiation.
 - Medication dispensed as per a pharmaceutical or administrative database.

This KPI is specifically measuring “initiation” and/or remaining on treatment if the patient was on first-line osteoporosis treatment prior to the index fracture. Assessment of adherence and persistence are separate measurements (see supplementary indicators).

Supplementary KPIs

(strongly recommended for FLSs with sufficient resources)

Patient demographics data to be collected:

Over and above the “core” demographics, the following demographic data is strongly recommended:

- Patient sex
- Prior fragility fractures after age 40 including fracture type (hip, spine, wrist, shoulder, pelvis) and number (e.g. 2 prior fragility fractures)
- Number of falls in the last year (including the one that led to the incident fracture). Most vertebral fractures are not precipitated by a fall.
- Treatment status at the time of the fracture (e.g. already on osteoporosis treatment at the time of the fracture)
- Treatment “failure” (e.g. patient has already received a full year or more of appropriate osteoporosis treatment prior to the fragility fracture)

Third i, for subset of patients not already on treatment at the time of incident fracture:

NUMERATOR	Number of HIGH RISK patients who are not already on osteoporosis treatment at the time of fracture who are initiated ^a on a first-line osteoporosis medication <u>within 26 weeks</u> of the incident fracture.
DENOMINATOR	Number of HIGH RISK patients (after determination of fracture risk by a validated fracture risk determination tool such as FRAX with or without BMD or CAROC) who are not already on osteoporosis treatment at the time of fracture.

- a. Initiation may be ascertained by one of the following methods:
- FLS providing the prescription to the patient directly.
 - Patient self-report of treatment initiation.
 - Medication dispensed as per a pharmaceutical or administrative database.

Adherence and persistence to first-line osteoporosis medication:

Adherence is a major issue with all osteoporosis medications, and particularly with oral bisphosphonates. Patients may take their oral bisphosphonate in an inappropriate manner (e.g. with food or with other medications) or may forget some of their medications (e.g. may take only 2 or 3 of their weekly doses each month). Regardless of which osteoporosis medication is used, some doses may be missed or significantly delayed.

Persistence is an issue for all osteoporosis medications. It is known that many patients lose faith in their osteoporosis medications or become concerned about the risk of rare side-effects and decide to stop their medications, often without even consulting with or notifying their healthcare providers.

	Adherence	Persistence
NUMERATOR	Number of patients adherent with their prescribed osteoporosis medication ^a .	Number of patients who are still on first-line osteoporosis medication (whether it is still the original one, or switched to an alternate one) 52 weeks after their incident fracture ^b .
DENOMINATOR	Number of patients initiated and/or recommended to remain on first-line osteoporosis medication.	Number of patients initiated and/or recommended to remain on first-line osteoporosis medication.

- a. Adherence is defined differently depending on each therapeutic agent:
 - i. For daily teriparatide or raloxifene, taking 80% or more of their prescribed doses
 - ii. For weekly or monthly oral bisphosphonates, taking 80% or more of their prescribed doses AND also taking as per instructions (e.g. on empty stomach where warranted)
 - iii. For denosumab, no delays longer than 7 months between doses
 - iv. For zoledronic acid, no delays longer than 18 months between doses
- b. For persistence, in the case of zoledronic acid and denosumab, confirmation that the medication was administered is required.

Falls prevention:

The incidence of falls in seniors is significant, as is the number of fractures that have occurred as a result of a fall. Therefore, it is particularly important to focus on future fall prevention strategies in this population. Alongside osteoporosis medication, identification of falls risk and subsequent referrals to appropriate services can further act to reduce secondary fractures. Falls prevention referrals may include, but are not limited to, geriatric assessments, balance and strength training classes, vision care, medication reviews, and home safety assessments.

NUMERATOR	Number of patients who were referred to a falls prevention program.
DENOMINATOR	Number of patients enrolled by the FLS who were deemed to be at higher risk of falls.

Repeat/subsequent fractures:

An effective FLS can be expected to reduce the number of repeat/subsequent fractures within 1 to 2 years. For FLSs with sufficient resources, an even longer follow-up period is recommended.

NUMERATOR	Number of enrolled FLS patients who have suffered a new fracture of the hip (proximal femur), spine (thoracic/lumbar), shoulder (proximal humerus), wrist (distal radius) or pelvis within a specified time frame (e.g. one year or two years).
DENOMINATOR	Number of FLS patients for whom the FLS has follow up data (either through continued contact with the patient or via other means such as access to diagnostic imaging studies) within a specified time frame (e.g. one year or two years).

For this indicator, it will be important to also state clearly the FLS's rate of patient follow-up, i.e. the proportion of high risk patients for whom there is longer term data to ascertain whether or not there has been a subsequent fracture.

Interpretation of FLS KPIs

Caution must be exercised when interpreting the KPIs for an individual FLS or patient stream. Weak performance is likely the result of a barrier. Barriers to FLS success can be classified as:

'Fracture prevention makes sense in Kaiser because it is considerably less expensive to prevent a hip fracture than to manage it, simple as that.'

Richard Dell MD,
Orthopaedic Lead,
Kaiser Healthy
Bones Program,
U.S.A.

- Internal: limitations due to issues specific to the FLS itself (e.g. FLS inclusion/exclusion criteria, algorithms, processes, etc.)
- External: limitations due to issues outside the control of the FLS (e.g. limited access to bone mineral density (BMD) testing, limited access to effective osteoporosis medications on the provincial medical insurance plan, etc.)

FLSs which discover a major weakness for any of the individual 3i's may require more comprehensive performance measurements than recommended in this document to further analyze and identify their specific barriers. For a more complete listing of internal and external barriers, please see the *Report from Osteoporosis Canada's first national FLS audit: leading FLS improvement in Canada* at <http://fls.osteoporosis.ca/wp-content/uploads/Report-from-Osteoporosis-Canadas-first-national-FLS-audit.pdf>

The effect of under-resourcing:

Unfortunately, most Canadian FLSs struggle with under-resourcing and it is impossible to have a completely effective FLS without adequate funding. As a result of under-resourcing, difficult decisions have to be made to restrict some of the FLS services in order to maximize outcomes with the limited resources allocated. In other words, many FLSs have had the perverse task of having to determine which patients the FLS will automatically have to "leave behind".

Vertebral fractures:

The current version of the FLS KPIs is designed to assess FLSs implemented in the orthopaedic settings (inpatients and/or outpatients), but the reality is that very few vertebral fractures are ever seen in those settings. The current version of the KPIs is effectively "leaving behind" the overwhelming majority of the vertebral fracture patients. This will be addressed fully in a future version of this document. At this stage, OC is simply exploring the capacity of the current Canadian FLSs to manage vertebral fracture patients.

Weakness in any of the FLS KPIs should NEVER be automatically interpreted as reflecting a problem with the FLS itself until a full analysis is completed.

Case study

Regional hospital A has an inpatient-only FLS focusing exclusively on hip fracture patients. The FLS sees an older patient population. At the end of its first year of operation, the FLS participates in an OC national FLS audit. The hospital's performance is described as follows:

	Patients with hip fracture	Patients with non-hip, non-spine fracture	Patients with spine fracture Exploratory only
First i	80%	N/A This remains a care gap at this hospital	N/A
Second i	100%		
Third i	35%		

The FLS team is surprised at the relatively poor performance for their third i. In reviewing the possible internal and external barriers, they identify many significant barriers to success for their third i, including:

- Many patients are quickly transferred from their regional hospital to the patient's home hospital and there is currently no process at the FLS to follow-up such patients
- Several of the primary care providers of the region are reluctant to prescribe osteoporosis medications to their elderly patients, believing erroneously that it takes many years for these medications to prevent a fracture.
- Some of the long term care (LTC) facilities of the region routinely stop osteoporosis medications when patients are admitted to their facility.

PLAN:

- The FLS team will set new processes in place that will permit the FLS coordinator to do phone follow-up with patients and/or their closest relative if the patient is discharged/transferred before counselling re osteoporosis treatment can be provided.
- The FLS develops a fact sheet on *Management of osteoporosis in the elderly* to accompany the FLS's recommendations sent to the patients' primary care providers.
- A speaker is organized to present on Osteoporosis Canada's LTC Guidelines at the next conference of the provincial association of Care of the Elderly physicians, most of whom work in LTC facilities.
- The FLS team is looking forward to participating in OC's next national FLS audit. They are hopeful they will see a significant improvement in their third i.

A fragility fracture of the hip is automatically considered HIGH RISK. A BMD test is not needed for fracture risk determination.

A nationwide post-fracture osteoporosis care gap exists throughout Canada which is leaving Canadians needlessly at risk of suffering future fractures and resulting in an enormous avoidable expenditure on fracture care. Access to Fracture Liaison Services for all Canadians will transform the delivery of postfracture care and result in significant financial savings.

What Canada needs now!

The post-fracture care gap has been well documented in Canada. Data presented by the Public Health Agency of Canada (PHAC) at an international scientific conference in September 2018 reviewed pan-Canadian trends in post-fracture care from 2000 to 2015⁵. Only one in four women and one in six men received a new osteoporosis prescription in the year following a major osteoporotic fracture. Additionally, the post-fracture care gap has worsened significantly since 2009.

Based on overwhelming evidence, only FLS can close the huge post-fracture care gap. Indeed, FLS is quickly becoming the standard of care internationally. Unfortunately Canada lags far behind.

The OC FLS Registry (<http://www.osteoporosis.ca/fls/canadian-fls-registry/>) was launched in May 2016 to profile Canadian hospitals offering FLS meeting the 8 Essential elements. With only 46 FLSs in 5 provinces on the Registry as of November 1st, 2018, the overwhelming majority of Canadians who suffer a fragility fracture still do not have access to an FLS and are therefore stuck in the nation-wide post-fracture care gap. Their high risk for new fractures remains unchecked. **Many more FLSs are needed in Canada!**

Jurisdictions which have implemented FLS are to be congratulated for ensuring that quality osteoporosis care is provided to fragility fracture patients. However, as there are many internal and external barriers, it is critical that each FLS document their effectiveness at closing the care gap. The OC KPIs are a critical tool for the measurement and monitoring of the FLS's effectiveness.

In 2018, OC conducted Canada's first national FLS audit, restricted to "core" KPIs. The results are available in the *Report from Osteoporosis Canada's first national FLS audit: leading FLS improvement in Canada* at <http://fls.osteoporosis.ca/wp-content/uploads/Report-from-Osteoporosis-Canadas-first-national-FLS-audit.pdf>. A second national FLS audit is planned for 2019-2020.

Canadian FLSs focused on continuous quality improvement will be better equipped to identify barriers to success and to adopt solutions to enhance their patient outcomes. Every FLS that participates in the OC FLS audits will be making a contribution to closing the post-fracture care gap, not only at the local level, but also on a national scale.

What Canadian FLSs need now is the opportunity to reach their full potential and the OC FLS KPIs will be a critical part of that success. Effective FLSs will become the standard to be emulated by future Canadian FLSs.

Osteoporosis Canada's goal is to ensure that no fragility fracture patient is "left behind" and that every Canadian has access to appropriate post-fracture care. Together, we can be successful and help **make their FIRST break their LAST!**

Acknowledgements

The team behind the development of Osteoporosis Canada's FLS KPIs v2.0 are members of the FLS Audit Committee, with representation from each province featured on the OC FLS Registry. The Audit Committee members have generously donated their time and expertise to help ensure that the recommendations in this document are pragmatic, aligned with the current OC guidelines/FLS Toolkit and are adapted to the Canadian reality.

FLS Audit Committee

Chair: Brigadier General (retired) Hilary Jaeger, MSc, MD

Dorcas Beaton, PhD, MSc, BScOT, *Ontario*

Josée Delisle, BScN, MSc, *Québec*

Shannon Falsetti, RN, BScN, GNC (C), *Alberta*

Sonia Singh, MD, MHSC, *British Columbia*

Diane Theriault, MD, FRCPC, CCD, *Nova Scotia*

We also thank Luanne Schenkels, Osteoporosis Canada's FLS Manager, for her assistance with this work.

Fracture Liaison Services have been shown to be highly cost-effective in Canada and internationally.



Appendix:

Osteoporosis Canada's Essential Elements of Fracture Liaison Services (FLS)

The 8 *Essential elements* are:

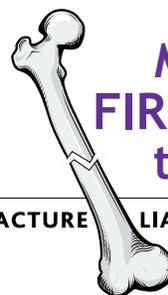
1. A dedicated coordinator is central to the FLS model of care^{6,7}. The clearly designated FLS coordinator is:
 - a. exclusively responsible and accountable for all the FLS functions
 - OR
 - b. exclusively responsible and accountable for the first FLS function (identification) and for the transfer of the second and/or third FLS functions (investigation and initiation) to a clearly designated osteoporosis expert or osteoporosis specialty team.
2. Pro-active, system-wide case finding of new fragility fractures and/or newly reported vertebral fractures:
 - a. For non-spine fractures, the pro-active case finding must be from the hospital's orthopaedic inpatient and/or orthopaedic outpatient service or an equivalent administrative database.
 - b. For radiologic vertebral fractures, the pro-active case finding must be through comprehensive screening of **ALL** of the reports issued directly from the hospital's Diagnostic Imaging Department.
3. The FLS must target at least one of the WHO major osteoporotic fracture types (hip, spine, wrist, shoulder).
4. The FLS model must be at least 2i (identification and investigation) or 3i (identification, investigation and initiation). Flexibility may be needed for FLS models targeting radiological spine fractures where provincial privacy legislation may restrict certain FLS processes from occurring for these particular patients.
5. The FLS must determine the patient's fracture risk by a validated fracture risk assessment tool.
6. First line osteoporosis medications must be initiated (3i FLS) or recommended (2i FLS) for high risk patients.
7. Integration with primary care is a critical component of any FLS: written communication to the patient's primary care provider must include the patient's fracture risk and all osteoporosis treatments initiated and/or recommended for the patient.
8. Data must be collected to determine the FLS's ability to close the post-fracture care gap. All FLSs should contribute data to Osteoporosis Canada's national FLS audits.

All FLSs featured on the Osteoporosis Canada FLS Registry have met the 8 *Essential elements* for FLS. An FLS should strive to go beyond the *Essential elements* and attain all of the "*Quality Standards for Fracture Liaison Services in Canada*"³⁵.

References:

- Besette L, Ste-Marie LG, Jean S, et al. The care gap in diagnosis and treatment of women with a fragility fracture. *Osteoporos Int.* 2008;19(1):79-86.
- Leslie WD, Giangregorio LM, Yogendran M, et al. A population-based analysis of the post-fracture care gap 1996-2008: the situation is not improving. *Osteoporos Int.* 2012;23(5):1623-1629.
- Jean S, Gamache P, Brown JP, et al. Temporal trends analysis of post-fracture management: a population-based study, 2000-2014. *J Bone Miner Res.* 2016;31 Suppl 1. Available at <http://www.asbmr.org/education/AbstractDetail?aid=3f91cada-b643-4875-9dcf-744120a5d035>. Accessed on August 4, 2017.
- Solomon DH, Johnston SS, Boystov NN, et al. Osteoporosis medication use after hip fracture in U.S. patients between 2002 and 2011. *J Bone Miner Res.* 2014;29(9):1929-1937.
- Morin SN, O'Donnell S, Jean S, et al. Post-fracture care gap in Canada from 2000-2011 to 2014-2015: a nationwide population-based analysis. Presented at the American Society of Bone and Mineral Research annual meeting, 2018.
- Sale JE, Beaton D, Posen J, Elliot-Gibson V, Bogoch E. Systematic review on interventions to improve osteoporosis investigation and treatment in fragility fracture patients. *Osteoporos Int.* 2011;22(7):2067-2082.
- Ganda K, Puech M, Chen JS, et al. Models of care for the secondary prevention of osteoporotic fractures: a systematic review and meta-analysis. *Osteoporos Int.* 2013;24(2):393-406.
- Wu CH, Tu ST, Chang YF, et al. Fracture liaison services improve outcomes of patients with osteoporosis-related fractures: a systematic literature review and meta-analysis. *Bone.* 2018;111:92-100.
- Bogoch ER, Elliot-Gibson V, Beaton DE, Jamal SA, Josse RG, Murray TM. Effective initiation of osteoporosis diagnosis and treatment for patients with a fragility fracture in an orthopaedic environment. *J Bone Joint Surg Am.* 2006;88(1):25-34.
- Majumdar SR, Beaupre LA, Harley CH, et al. Use of a case manager to improve osteoporosis treatment after hip fracture: results of a randomized controlled trial. *Arch Intern Med.* 2007;167(19):2110-2115.
- Majumdar SR, Johnson JA, Bellerose D, et al. Nurse case-manager vs multifaceted intervention to improve quality of osteoporosis care after wrist fracture: randomized controlled pilot study. *Osteoporos Int.* 2011;22(1):223-230.
- McLellan AR, Gallacher SJ, Fraser M, McQuillan C. The fracture liaison service: success of a program for the evaluation and management of patients with osteoporotic fracture. *Osteoporos Int.* 2003;14(12):1028-1034.
- Dell R, Greene D, Schelkun SR, Williams K. Osteoporosis disease management: the role of the orthopaedic surgeon. *J Bone Joint Surg Am.* 2008;90 Suppl 4:188-94.
- Boudou L, Gerbay B, Chopin F, et al. Management of osteoporosis in fracture liaison service associated with long-term adherence to treatment. *Osteoporos Int.* 2011;22:2099-106.
- Lih A, Nandapalan H, Kim M, et al. Targeted intervention reduces refracture rates in patients with incident non-vertebral osteoporotic fractures: a 4-year prospective controlled study. *Osteoporos Int.* 2011;22(3):849-858.
- Huntjens KM, van Geel TC, Geusens PP, et al. Impact of guideline implementation by a fracture nurse on subsequent fractures and mortality in patients presenting with non-vertebral fractures. *Injury.* 2011;42 Suppl 4:S39-43.
- Sander B, Elliot-Gibson V, Beaton DE, Bogoch ER, Maetzel A. A coordinator program in post-fracture osteoporosis management improves outcomes and saves costs. *J Bone Joint Surg Am.* 2008;90(6):1197-1205.
- Majumdar SR, Lier DA, Beaupre LA, et al. Osteoporosis case manager for patients with hip fractures: results of a cost-effectiveness analysis conducted alongside a randomized trial. *Arch Intern Med.* 2009;169(1):25-31.
- Dell R. Fracture prevention in Kaiser Permanente Southern California. *Osteoporos Int.* 2011;22 Suppl 3:457-460.
- 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;22(7):2083-2098.
- Department of Health (UK). Fracture prevention services: an economic evaluation. HMSO 2009.
- Cooper MS, Palmer AJ, Seibel MJ. Cost-effectiveness of the Concord Minimal Trauma Fracture Liaison service, a prospective, controlled fracture prevention study. *Osteoporos Int.* 2012;23(1):97-107.
- Leslie WD, Berger C, Langstemo L, et al. Construction and validation of a simplified fracture risk assessment tool for Canadian women and men: results from the CaMos and Manitoba cohorts. *Osteoporos Int.* 2011;22(3):1873-1883.
- Papaioannou A, Morin S, Cheung A, et al. 2010 clinical practice guidelines for the diagnosis and management of osteoporosis in Canada: summary. *Can Med Assoc J.* 2010;182(17):1864-1873.
- O'Donnell S & Canadian Chronic Disease Surveillance System (CCDSS) Osteoporosis Working Group. Use of administrative data for national surveillance of osteoporosis and related fractures in Canada: results from a feasibility study. *Arch Osteoporos.* 2013;8(1-2):1-6
- Fraser LA, Langsetmo L, Berger C, et al. Fracture prediction and calibration of a Canadian FRAX® tool: a population-based report from CaMos. *Osteoporos Int.* 2011;22(3):829-837.
- Leslie WD, Lix LM, Johansson H, et al. Independent clinical validation of a Canadian FRAX tool: fracture prediction and model calibration. *J Bone Miner Res.* 2010;25(11):2350-2358.
- Leslie WD, Lix LM, Langsetmo L, et al. Construction of a FRAX® model for the assessment of fracture probability in Canada and implications for treatment. *Osteoporos Int.* 2011;22(3):817-827.
- 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;24:2135-2152.
- National Osteoporosis Society (UK). Effective secondary prevention of fragility fractures: clinical standards for Fracture Liaison Services. April 2015.
- Osteoporosis New Zealand. Clinical standards for Fracture Liaison Services in New Zealand. Aug 2016.
- Royal College of Physicians. Fracture Liaison Service (FLS) Database facilities audit. FLS breakpoint: opportunities for improving patient care following a fragility fracture. London: RCP, May 2016.
- Royal College of Physicians. FLS forward: Identifying high-quality care in the NHS for secondary fracture prevention. London: RCP, April 2017.
- Mitchell PJ, personal communication.
- Osteoporosis Canada, Quality Standards for Fracture Liaison Services in Canada, November 2014.

OSTEOPOROSIS



**Make the
FIRST break
the LAST**

FRACTURE LIAISON SERVICES

**Osteoporosis Canada
1200 Eglinton Ave East, Suite 500
Toronto, Ontario M3C 1H9**

**Tel: (416) 696-2663
Fax: (416) 696-2673
1-800-463-6842 (M-F, 10-4 ET)**

www.osteoporosis.ca

Charitable Registration Number 89551 0931 RR0001
Copyright © November 1, 2018

