OSTEOPOROSIS

Make the FIRST break the LAST
FRACTURE LIAISON SERVICES

Report from Osteoporosis Canada's Third National Fracture Liaison Services (FLS) Audit (2023): Helping Canadian FLSs reach their full potential

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Executive Summary

After a first fragility fracture, the risk of a subsequent fracture approximately doubles and is most likely to occur within the next two years. Fewer than 20% of Canadians who present with a new fragility fracture will be diagnosed and/or treated for their underlying osteoporosis within one year. Fracture Liaison Services (FLS) is the most effective model of care to ensure fracture patients receive the interventions they need to prevent new fractures. However, the majority of fragility fracture patients in Canada still do not have access to this proven model of care. Canada needs many more FLSs to meet the needs of Canadians!

Osteoporosis Canada's (OC) national FLS audits are a critical component of FLSs continuous quality improvement (CQI). Three national audits have been conducted in 2018, 2020 and 2023. This report provides an overview of the 2023 national FLS audit that assessed four Key Performance Indicators (KPI) from a cohort of patients within each participating FLS from April 1 to September 30, 2022, and followed these patients for 12 months post fracture.

The results of this audit need to be interpreted within the context of many challenges to FLS performance, most importantly the impact of the COVID pandemic. During the audit time period, 30% of the FLSs lost their coordinator for two weeks or more, 25% of the FLSs were brand new or had a new FLS coordinator and an increasing number of FLSs reported patients with no primary care provider (PCP) to follow up on treatment recommendations.

Key learnings from this audit

1. Canadian FLSs do an excellent job in supporting patients who start on osteoporosis medication to persist with their medication for at least one year.
2. Despite major barriers and challenges, the number of patients having access to FLS in Canada almost doubled over the last three audit time periods (2018-2023).
3. The COVID pandemic and FLS coordinator absence had an important negative impact on FLSs' ability to achieve optimal effectiveness.
4. OC sustained a disruption in FLS support during the COVID pandemic years that could have negatively impacted FLS performance.
5. Initiation of osteoporosis medication in patients at high risk for repeat fractures continues to be the most challenging aspect of FLS work.

This is the last audit to be conducted using language and KPIs aligned with the 2010 OC guidelines. To support all FLSs in their transition to the new 2023 OC guidelines, OC will be providing new supports that will include a new KPI guidance document, a new data collection tool and opportunities for education and answering questions about the new FLS audit processes.

March 2025

Glossary of terms and acronyms used in this document

Fragility fracture:
A fragility fracture is a fracture occurring spontaneously or following minor trauma such as a fall from standing height or less.

Fracture Liaison Service (FLS):
FLS is an evidence-based model of care for secondary fracture prevention where a dedicated coordinator carries out the following core functions:

IDENTIFICATION	Systematically and proactively identifies patients aged 50 years and older presenting to an acute care facility with a new fragility fracture.
INVESTIGATION	Organizes appropriate investigations to determine the patient's future fracture and fall risk;
INITIATION	Facilitates the initiation of appropriate osteoporosis medications and other non-pharmacologic interventions to prevent future fractures.

Key performance indicator (KPI): is a metric that measures the performance of a healthcare service. KPIs are used to measure the performance of the FLS at the level of the system and are a useful tool to facilitate on-going quality improvement of FLSs.

Non-hip, non-spine (NHNS) fractures: refers to wrist (distal radius), shoulder (proximal humerus) and pelvic fractures.

Type of FLS

Inpatient-only FLS: enrolls only fragility fracture patients admitted to hospital and most often includes only hip fracture patients.

Outpatient-only FLS: enrolls only fragility fracture patients from orthopaedic outpatient clinics and most often includes only NHNS fracture patients.

Combined inpatient/outpatient FLS: FLS that enrolls patients admitted to hospital and from orthopaedic outpatient clinics.

Other Acronyms
CQI: Continuous Quality Improvement
OC: Osteoporosis Canada
PHAC: Public Health Agency of Canada

March 2025

Background

After a first fragility fracture, the risk of a subsequent fracture approximately doubles and new fractures are most likely to occur within the next two years.[1–5] The Public Health Agency of Canada (PHAC) has documented that fewer than 20% of Canadians who present with a new fragility fracture will be diagnosed and/or treated for their underlying osteoporosis within one year of that fracture, despite the availability of inexpensive medications that are effective at reducing the risk of secondary fractures[6]. FLS is the most effective secondary fracture prevention model of care to ensure fracture patients receive the interventions they need to prevent new fractures.[7-14]

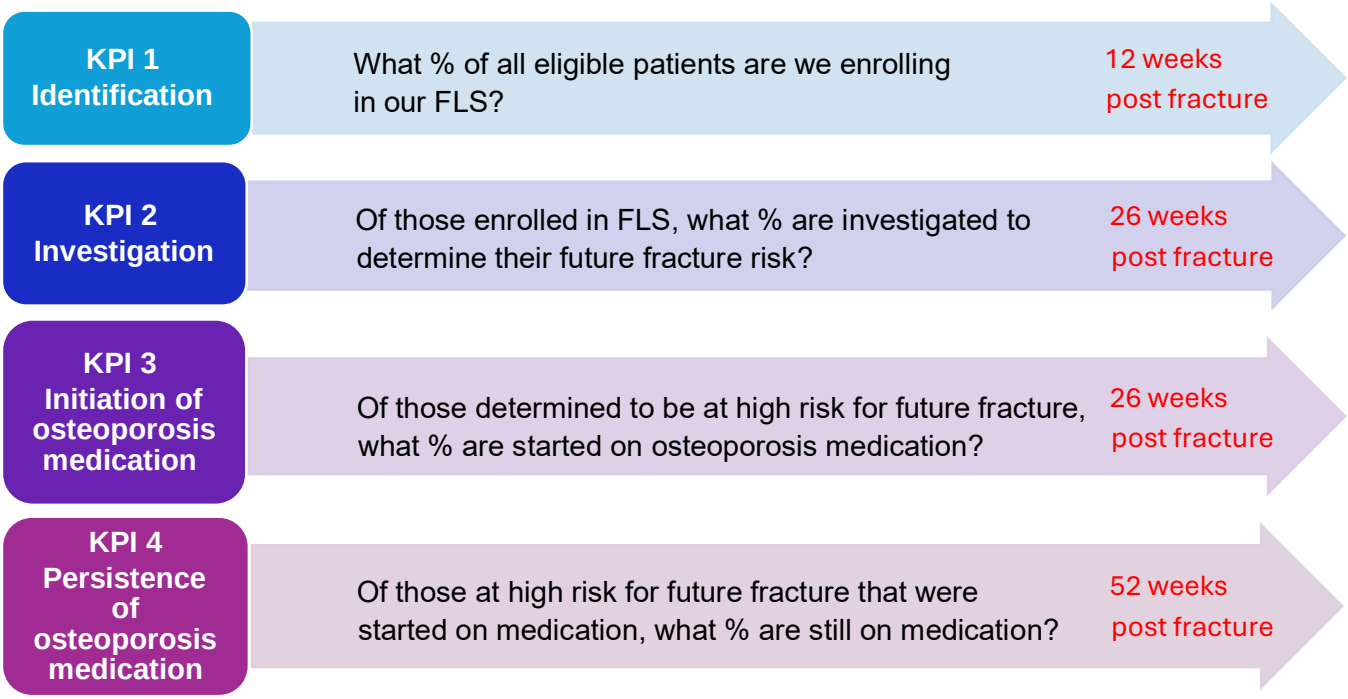
FLS:

- increases the proportion of patients who receive secondary fracture prevention investigation and treatment after a fragility fracture [7-25]
- reduces the incidence of repeat fractures [14,22,23,25-28]
- reduces mortality in this patient population[14,24,26,27,29,30]
- reduces healthcare utilization and associated costs [31-36]

OC's national FLS audits are a critical component of FLSs' CQI. This national FLS audit is intended for all Canadian FLSs, excluding those of the Ontario Osteoporosis Strategy as the latter conducts its own internal audits. As this is a voluntary audit, we are most grateful for the hard work of the many healthcare professionals and administrators who have contributed to this effort. FLSs submit aggregate rather than patient level data; therefore, OC is not able to verify the accuracy of the submitted data. Three national audits have been conducted in 2018, 2020 and 2023. This report provides an overview of the 2023 FLS national audit. This is the last audit to be conducted using language and KPIs aligned with the 2010 OC guidelines.

OC Third National FLS audit KPIs

OC's third national FLS audit measured four KPIs within specified timeframes post fracture. KPI 4: Persistence of osteoporosis medication is new to the 2023 FLS audit.



KPI Benchmarks

Benchmark thresholds have been developed for KPI 1-3 (Appendix A). KPI 4 is new to the 2023 FLS audit and a benchmark has yet to be developed. The benchmarks and thresholds will be reviewed periodically by the FLS Audit Committee as standards may change and it is anticipated that the performance of FLSs will gradually improve over time.

KPIs 1 and 3

Levels to be reached	Color	Interpretation
0-49%	RED	Highest priority for service improvement
50-79%	AMBER	Good, room for improvement
≥ 80%	GREEN	Great, at or near optimal

KPI 2

Levels to be reached	Color	Interpretation
0-94%	RED	Highest priority for service improvement
≥ 95%	GREEN	Great, at or near optimal

OC's Third National FLS Audit Results:

OC's third national FLS audit assessed the KPIs for the cohort of fragility fracture patients enrolled by the participating FLSs from April 1 to September 30,2022 and followed for 12 months post fracture. All 25 FLSs that were eligible participated in the audit (100% participation rate).

Type of participating FLSs	Number of FLSs
Combined inpatient/outpatient FLS	11
Inpatient-only FLS	13
Outpatient-only FLS	1

OC supports participation in the national FLS audits by all FLSs, including FLSs who have recently implemented and might not have sufficient follow up time to submit data for all the KPIs. At the time of the third audit, four FLSs were recent implementers: three provided data for KPI1 only and one provided data for KPIs 1-3.

Aggregate KPI Results:

Due to issues with data integrity and quality collected by four FLSs, these results include only 21 of the participating FLSs. The 2024 FLS audit included 2625 patients with a new fragility fracture. With respect to eligible patients enrolled at the 21 FLS sites:

- 74% of hip fracture patients were enrolled (KPI 1-hip fracture)
- 51% of NHNS fracture patients were enrolled (KPI 1-NHNS)
- 98% of all enrolled patients completed a fracture risk assessment (KPI 2)
- 49% of all high-risk patients were initiated on osteoporosis medication (KPI 3)

- 78% of the high-risk patients that were initiated on medication, remained on osteoporosis medication 52 weeks post fracture (KPI 4).

The aggregate results from all three FLS audits since 2018 are provided below. By consensus, the FLS Audit Committee has determined that absolute changes of 5% will be highlighted as follows:

- ↑ denotes an absolute increase of ≥ 5%
- ↓ denotes an absolute decrease of ≥ 5%
- ↔ denotes no significant change (a change that is < 5%). Any changes that are fully within the optimal (GREEN) benchmark zone are considered insignificant as they are already at or near optimal.

KPI	2018 First Audit 1398 patients	2020 Second Audit 1870 patients	2023 Third Audit 2625 patients
KPI 1, HIPS Identification	**73%**	**↑79%**	**↔74%***
KPI 1, NHNS Identification	**56%**	**↑73%**	**↓51%**
KPI 2 Investigation	**90%**	**↑95%**	**↔98%**
KPI 3 Initiation of osteoporosis medication	**49%**	**↑57%**	**↓49%**
KPI 4 Persistence of osteoporosis medication	**N/A**	**N/A**	**78%**

*KPI 1 hips was 74.1 %, therefore absolute change from 2020 was less than 5%.

Percentage of FLSs reaching each benchmark level (as described above) in third audit

KPI 1 Hips	29%
	62%
	9%
KPI 2 NHNS	22%
	33%
	44%
KPI 2	89%
	NA
	11%
KPI 3	11%
	28%
	61%

OC's third national FLS audit: interpretation

While OC's national FLS audits evaluate only the FLS and its processes, we recognize that the wider system in which the FLS operates is also important. The results of this audit need to be interpreted within the context of many challenges to FLS performance, most importantly the impact of the COVID pandemic. During the audit time period, 30% of the FLSs lost their coordinator for two weeks or more, 25% of the FLS were brand new or had a new FLS coordinator and an increasing number of FLSs reported patients with no PCP to follow up on treatment recommendations. The relatively high proportion of newly implemented FLS would be expected to result in lower KPI results in this audit cycle. OC was not immune to the effects of the COVID pandemic and sustained some disruption in normal support services for FLSs.

Despite these challenges, 10 more FLSs participated in the 2023 audit compared to the 2020 audit and the total number of people with fragility fractures that were enrolled in an FLS increased by 40% (1870 people in 2020 compared to 2625 in 2023). Given that many FLSs lost their FLS coordinator for long periods of time during the audit time period, it is not surprising that we saw drops in the proportion of eligible NHNS fracture

patients enrolled into FLS (KPI 1, NHNS) and the proportion of high-risk patients initiated on osteoporosis treatments (KPI 3). New FLSs are expected to start with more modest KPI results and gradually improve over time. We also noticed a trend suggesting that well established FLSs (running for more than five years) had better results than newer FLSs.

A new barrier to enrollment of patients into FLSs during the 2023 audit has been the sharp rise in the proportion of patients with no PCP. The majority of FLSs do not enroll patients who have no PCP to initiate medication and to follow-up with ongoing prescriptions. In addition, the benefit of osteoporosis medication in preventing an imminent new fracture is very often dwarfed by patient's and PCP's disproportionate fear of extremely rare side-effects. [37,38]

It was reassuring that the proportion of hip fracture patients enrolled into FLSs remained stable as did the proportion of patients that were risk assessed within six months of their fracture. The results of KPI 4 demonstrate that FLSs are very successful in ensuring that patients remain on treatment once they have been initiated on osteoporosis treatment (aggregate of 78% and median of 81%).

Key learnings from this audit

1. Canadian FLSs do an excellent job in supporting patients who start on medication, to persist with their medication for at least one year.
2. Despite major barriers and challenges, the number of patients having access to FLS in Canada almost doubled over the last three audit time periods (2018-2023).
3. The COVID pandemic and FLS coordinator absence had an important negative impact on FLSs' ability to achieve optimal effectiveness.
4. OC sustained a disruption in FLS support during the COVID pandemic years that could have negatively impacted FLS performance.
5. Initiation of osteoporosis medication in patients at high risk for repeat fractures continues to be the most challenging aspect of FLS work.

FLS remains a very rare entity in this country. There are hundreds of hospitals offering orthopaedic fracture care in Canada BUT there were only 52 FLSs at the time of the audit ending in September 2023. Despite the compelling scientific and health economics evidence in support of FLS, the overwhelming majority of Canadians who suffer a fragility fracture still do not have access to an FLS in 2025!

Next steps to support FLS performance

Canadian FLSs are to be congratulated for their commitment to ensuring quality fracture prevention care for fragility fracture patients. The high participation rate in this voluntary audit is a testament to that commitment despite the challenges of the COVID pandemic and the PCP crisis.

Participating in the Osteoporosis Canada FLS national audits will support each FLS to develop greater effectiveness and efficiency. Local FLS teams will review the results reported in their confidential FLS KPI reports to identify areas for improvement. They can then begin to address barriers to success and to adopt solutions that will help enhance patient outcomes. The audit results will assist them in developing a quality improvement plan to improve their FLS processes, thus optimizing patient care.

The OC FLS implementation lead and staff will be looking at ways to streamline and automate all audit processes. This streamlining would allow more time to devote to supporting the implementation of new FLSs and to the development of new strategies to overcome challenges identified in this audit report.

This is the last audit to be conducted with the 2010 OC guidelines. In October of 2023[39] the new 2023 Guidelines for Osteoporosis were published by OC and the 2027 audit will be aligned with these new guidelines. To support all FLSs in their transition to the new guidelines, OC will be providing new supports:

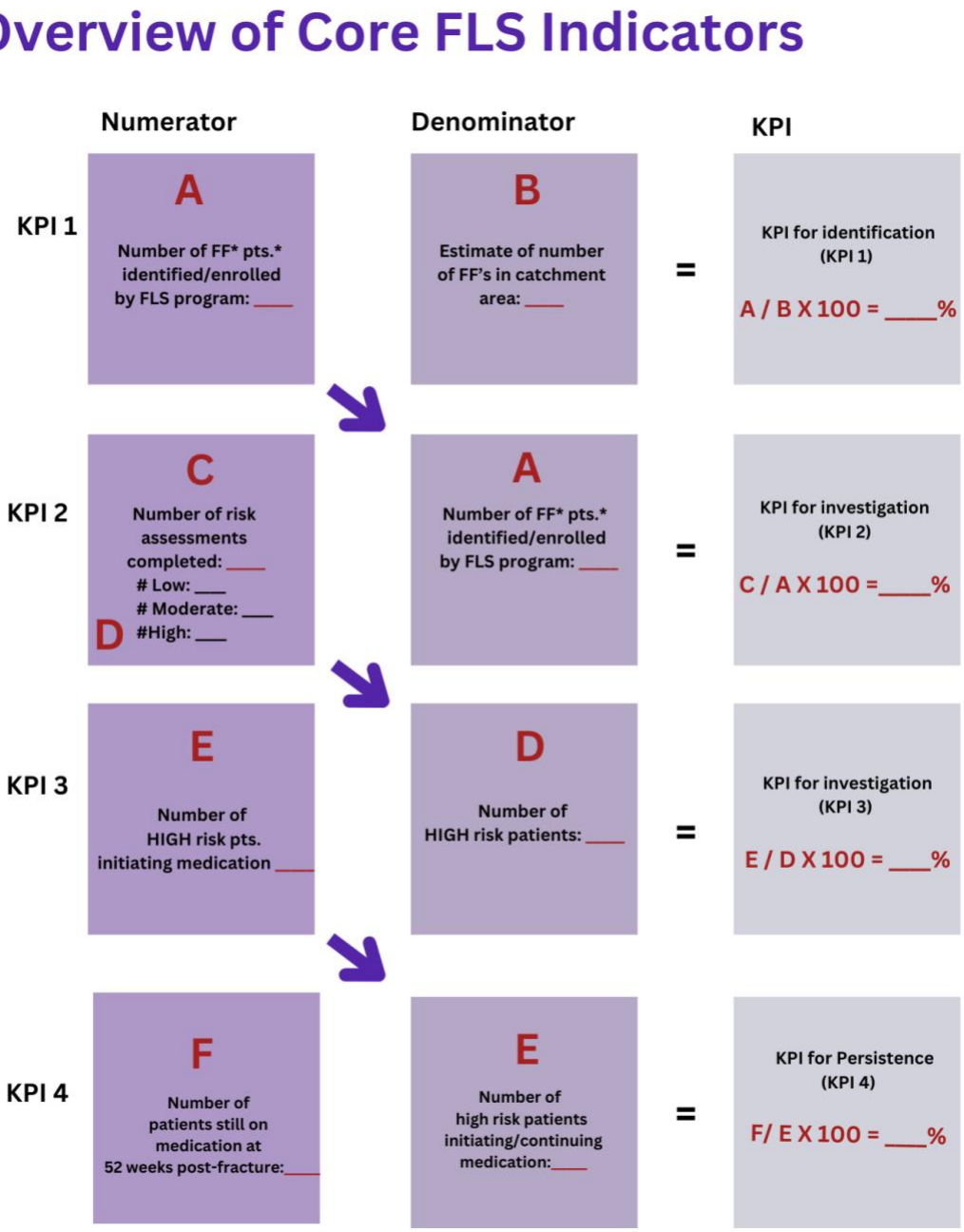
1. All FLS tools and processes on the FLS HUB on the OC website will be updated to reflect the new guidelines.
2. A new KPI guidance document version 4 will be created by the FLS audit committee to support FLSs with the next audit cycle.
3. A new data collection tool will be developed in preparation for the next audit cycle which will start in Sept 2025.
4. Opportunities for education and answering questions about the new audit cycle (e.g. creation of a FAQ document, Q and A webinars).
5. A "cross country check-up" with each FLS to understand how they are addressing challenges with treatment initiation and PCP shortages.
6. Exploring the feasibility of incorporating motivational interviewing into FLS training programs.

Finally, it needs to be re-emphasized that the quality care highlighted in this report is restricted to patients being assessed and managed by an FLS. There are hundreds of Canadian hospitals offering orthopaedic services. But with only 53 FLSs on the OC FLS Registry as of February,2025 the overwhelming majority of fragility fracture patients in Canada still do not have access to this proven model of care. Without FLS, it is well

documented that 80% of fragility fracture patients will not receive the interventions they need to prevent their next fracture. Canada needs many more FLSs to meet the needs of Canadians!

Let's make their FIRST break their LAST!

Appendix A: How The KPIs Are Calculated



**FF Stands for "fragility fracture"*

Determining which KPIs to collect and how to calculate them followed a process of literature review, reviewing documentation from quality frameworks in other countries,

review of the International Osteoporosis Foundation's FLS KPIs and consensus discussion within the OC FLS audit committee.

The denominator for KPI1 is an estimate of the total number of fragility fractures in the area served by the FLS. This estimate is derived from the number of hip fracture patients seen by the hospital and collected in the hospital administrative database. It is recognized that some of these hip fracture patients are not eligible to be enrolled in a FLS (trauma related such as a motor vehicle accident or pathological fracture) and therefore this denominator may overestimate the true number of patients that a FLS could potentially enrol. Therefore, there is an unavoidable uncertainty in the denominator for KPI 1. A reasonably challenging threshold of 80% was chosen for "at or near optimal" in part because of the critical role this KPI1 plays in identifying how many patients may be "left behind" by FLSs.

Only KPI 2 allows for FLSs to attain 100% performance (or very close). As all FLSs in the OC Second National FLS audit were attaining close to 100% on KPI 2 for the second National FLS audit, a very high "at or near optimal" level of 95% was selected for the threshold for the GREEN zone. Anything below 95% was considered in the RED zone.

For KPI 3, no FLS can ever be expected to reach 100% because the denominator flows from the numerator for KPI 2 and will include patients who have died and patients for whom all osteoporosis medications are contraindicated. Although this reduces the precision of this KPI, it does allow for an even playing field when comparing FLSs. A threshold of 80% was selected for "at or near optimal" based on what is already documented to be possible when all fragility fracture patients are managed by a consultant with expertise in osteoporosis (e.g.gold standard).

KPI 4 is new to the 2023 audit and was designed to measure persistence of osteoporosis medication at 52 weeks in those high-risk patients who had been initiated on osteoporosis medication. No thresholds have been set for this new KPI.

Appendix B: Median KPI Results

The median KPI results across all three national audits provide the same trends as the aggregate KPI results with slightly different percentages in the table below.

KPI	2018 Median (range) 12 FLS	2020 Median (range) 15 FLS	2023 Median (range) 21 FLS	Change (>5%) From 2020 to 2023
KPI 1, HIP Identification	77% (54-100%)	79.5% (52-100%)	75% (36-92%)	↔
KPI 1, NHNS Identification	61% (54-96%)	74% (52-100%)	50% (31-84%)	↓
KPI 2 Investigation	98.5% (63-100%)	100% (68-100%)	100% (80-100%)	↔
KPI 3 Initiation of osteoporosis medication	50% (24-86%)	60% (38-83%)	47% (24-82%)	↓
KPI 4 Persistence of osteoporosis medication	N/A	N/A	81% (52-96%)	N/A

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