

Potential cost savings of FLS by province

Most Canadian jurisdictions currently do not have an FLS. Implementation of FLS will therefore require the creation of and hiring for new positions: FLS coordinators. As can be seen in this appendix, the new payroll costs for FLS coordinators will be very quickly offset by the cost reductions from averted hip fractures. Indeed, when formal cost-effectiveness analyses have been done, even when considering all costs (including additional BMD tests performed and additional anti-osteoporosis medications prescribed), 3i FLS is consistently proven to be very cost-effective¹⁻³.

This appendix shows the projected benefits and cost savings of implementing an FLS after 1 year¹ and through the first 8 years², both on a national level and province-by-province. The benefits are described as hip fractures averted, cost savings, acute care hospital bed days freed up, and estimates of long term care (LTC) admissions averted.

According to the conservative methodology described below, if all Canadian fracture patients received 3i FLS beginning in 2015, 20,000 hip fractures and 10,000 non-hip fractures would be averted. The Canadian health care system would save over \$413 million by 2023 in averted hip fracture costs alone. In addition, within that time frame, close to 450,000 acute care hospital bed days would be freed up and 2,800 – 4,800 long term care admissions would be averted.

Canada cannot afford a future without FLS.

Methodology

Source of data

1. Patients screened are based on the estimates of total annual fracture patients by type as per Table 2 of Appendix B, beginning in 2015. No attempt is being made to identify and screen patients who fractured prior to 2015. For the 8 year projection, the numbers

- of patients screened is adjusted downwards from the estimates of Appendix B to take into account the number of fractures already prevented.
2. Hip fractures averted in 1 year is based on the finding from Sander et al¹ that for every 500 fragility fracture patients assessed by their FLS, 3 hip fractures were averted.
3. Hip fractures averted through 8 years is based on the finding from McLellan et al² that for every 1000 patients seen over the 8 year period of the study, 11 hip fractures were averted
4. Costs are in constant 2010 Canadian dollars and are not discounted.
5. Estimate of 'other fractures averted' is based on McLellan et al's finding² that for every 1000 patients seen over the 8 year study period, 6 non-hip fractures were averted.

Assumptions

1. 'FTEs required' (FTE = Full time equivalent) assumes a '3i' FLS allowing a mean of 70 minutes per patient and a 37.5 hour workweek, with 20 days of holiday, 10 statutory holidays, 5 days of sick leave, and 5 days of continuing education, for a total of 1650 possible patient contact hours annually. This was then adjusted downwards by 20%, to 1320 hours, to make allowance for various sources of inefficiency. Note some FLS models have found less than 70 minutes required per patient, and a '2i' model would require less time per patient since the prescribing and medication counselling would not be done.
2. The adjustment of total patients screened assumed an even distribution of prevented fractures across the 8 year period.
3. It is assumed that the results obtained in Glasgow are generalizable to the Canadian context.

Limitations

1. The challenges of working with Canadian fracture data have been mentioned in Appendix B. Since so

much manipulation of the available real data has been required, the authors have taken care to be conservative in their projections. Even so, the results should be viewed as estimates.

2. Estimated cost savings are gross savings in acute care costs for hip fractures only; the cost of implementing the FLS has not been subtracted, nor have cost savings been calculated for rehabilitation or long term care, nor for non-hip fractures, nor lost productivity of patients or caregivers.

In the following pages, we present to you the potential cost savings of FLS, nationally and province-by-province (in alphabetical order). The following terms/acronyms are used:

- FLS: Fracture Liaison Service
- FTE: full time equivalent
- LTC: long term care
- % coverage: Proportion of fracture patients who are assessed/managed by the FLS. 100% coverage assumes that all fracture patients are managed by a 3i FLS. A lesser coverage assumes that not all fracture patients are managed by a 3i FLS (e.g. if some geographic regions are not served by an FLS).

For any jurisdiction with more recent/local hip fracture data, we also provide you with a generic Excel spreadsheet [\[click here for Excel\]](#). Simply insert your hip fracture number and the rest of the numbers will appear.

TABLE 1: NATIONAL ROLL-UP - Impact of FLS on hip fracture costs, related acute care bed days, and LTC admissions

		100% coverage	90% coverage	80% coverage	70% coverage	60% coverage	50% coverage
Approximate number of FTE required		187	169	150	131	112	94
Results at one year							
	Patients screened in first year (2015)	211,968	190,772	169,575	148,378	127,181	105,984
	Hip fractures averted in 1 year	1,272	1,145	1,017	890	763	636
Savings at one year*	Cost savings	\$27,267,624	\$24,540,862	\$21,814,099	\$19,087,337	\$16,360,575	\$13,633,812
	Acute care bed days freed up	29,252	26,326	23,401	20,476	17,551	14,626
	LTC admissions averted - low estimate	191	172	153	134	114	95
	LTC admissions averted - high estimate	318	286	254	223	191	159
Results at 8 years							
	Patients screened through 8 years	1,753,006	1,577,706	1,402,405	1,227,104	1,051,804	876,503
	Hip fractures averted through 8 years	19,283	17,355	15,426	13,498	11,570	9,642
	Other fractures averted through 8 yrs	10,518	9,466	8,414	7,363	6,311	5,259
Savings at 8 years*	Cost savings	\$413,428,989	\$372,086,090	\$330,743,191	\$289,400,292	\$248,057,393	\$206,714,494
	Acute care bed days freed up	443,511	399,160	354,808	310,457	266,106	221,755
	LTC admissions averted - low estimate	2,892	2,603	2,314	2,025	1,735	1,735
	LTC admissions averted - high estimate	4,821	4,339	3,857	3,375	2,892	2,892

*from averted hip fractures alone

TABLE 2: ALBERTA - Impact FLS on hip fracture costs, related acute care bed days, and LTC admissions

		100% coverage	90% coverage	80% coverage	70% coverage	60% coverage	50% coverage
Approximate number of FTE required		15	14	12	11	9	8
Results at one year							
	Patients screened in first year (2015)	17,027	15,325	13,622	11,919	10,216	8,514
	Hip fractures averted in 1 year	102	92	82	72	61	51
Savings at one year*	Cost savings	\$2,190,391	\$1,971,352	\$1,752,313	\$1,533,274	\$1,314,235	\$1,095,196
	Acute care bed days freed up	2,350	2,115	1,880	1,645	1,410	1,175
	LTC admissions averted - low estimate	15	14	12	11	9	8
	LTC admissions averted - high estimate	26	23	20	18	15	13
Results at 8 years							
	Patients screened through 8 years	142,336	128,102	113,869	99,635	85,401	71,168
	Hip fractures averted through 8 years	1,566	1,409	1,253	1,096	939	783
	Other fractures averted through 8 yrs	854	769	683	598	512	427
Savings at 8 years*	Cost savings	\$33,568,482	\$30,211,634	\$26,854,786	\$23,497,937	\$20,141,089	\$16,784,241
	Acute care bed days freed up	36,011	32,410	28,809	25,208	21,607	18,005
	LTC admissions averted - low estimate	235	211	188	164	141	117
	LTC admissions averted - high estimate	391	352	313	274	235	196

*from averted hip fractures alone

TABLE 3: BRITISH COLUMBIA - Impact of FLS on hip fracture costs, related acute care bed days, and LTC admissions

		100% coverage	90% coverage	80% coverage	70% coverage	60% coverage	50% coverage
Approximate number of FTE required		27	25	22	19	16	14
Results at one year							
	Patients screened in first year (2015)	30,856	27,771	24,685	21,599	18,514	15,428
	Hip fractures averted in 1 year	185	167	148	130	111	93
Savings at one year*	Cost savings	\$3,969,343	\$3,572,408	\$3,175,474	\$2,778,540	\$2,381,606	\$1,984,671
	Acute care bed days freed up	4,258	3,832	3,407	2,981	2,555	2,129
	LTC admissions averted - low estimate	28	25	22	19	17	14
	LTC admissions averted - high estimate	46	42	37	32	28	23
Results at 8 years							
	Patients screened through 8 years	254,985	229,487	203,988	178,490	152,991	127,493
	Hip fractures averted through 8 years	2,805	2,524	2,244	1,963	1,683	1,402
	Other fractures averted through 8 yrs	1,530	1,377	1,224	1,071	918	765
Savings at 8 years*	Cost savings	\$60,135,755	\$54,122,179	\$48,108,604	\$42,095,028	\$36,081,453	\$30,067,877
	Acute care bed days freed up	64,511	58,060	51,609	45,158	38,707	32,256
	LTC admissions averted - low estimate	421	379	337	295	252	210
	LTC admissions averted - high estimate	701	631	561	491	421	351

*from averted hip fractures alone

TABLE 4: MANITOBA - Impact of FLS on hip fracture costs, related acute care bed days, and LTC admissions

		100% coverage	90% coverage	80% coverage	70% coverage	60% coverage	50% coverage
Approximate number of FTE required		8	7	6	6	5	4
Results at one year							
	Patients screened in first year (2015)	9,157	8,241	7,325	6,410	5,494	4,578
	Hip fractures averted in 1 year	55	49	44	38	33	27
Savings at one year*	Cost savings	\$1,177,939	\$1,060,145	\$942,351	\$824,557	\$706,763	\$588,969
	Acute care bed days freed up	1,264	1,137	1,011	885	758	632
	LTC admissions averted - low estimate	8	7	7	6	5	4
	LTC admissions averted - high estimate	14	12	11	10	8	7
Results at 8 years							
	Patients screened through 8 years	75,783	68,205	60,627	53,048	45,470	37,892
	Hip fractures averted through 8 years	834	750	667	584	500	417
	Other fractures averted through 8 yrs	455	409	364	318	273	227
Savings at 8 years*	Cost savings	\$17,872,695	\$16,085,426	\$14,298,156	\$12,510,887	\$10,723,617	\$8,936,348
	Acute care bed days freed up	19,173	17,256	15,339	13,421	11,504	9,587
	LTC admissions averted - low estimate	125	113	100	88	75	63
	LTC admissions averted - high estimate	208	188	167	146	125	104

*from averted hip fractures alone

TABLE 5: NEW BRUNSWICK - Impact of FLS on hip fracture costs, related acute care bed days, and LTC admissions

		100% coverage	90% coverage	80% coverage	70% coverage	60% coverage	50% coverage
Approximate number of FTE required		4.8	4.3	3.8	3.3	2.9	2.4
Results at one year							
	Patients screened in first year (2015)	5,399	4,859	4,319	3,779	3,239	2,699
	Hip fractures averted in 1 year	32	29	26	23	19	16
Savings at one year*	Cost savings	\$694,488	\$625,039	\$555,590	\$486,141	\$416,693	\$347,244
	Acute care bed days freed up	745	671	596	522	447	373
	LTC admissions averted - low estimate	5	4	4	3	3	2
	LTC admissions averted - high estimate	8	7	6	6	5	4
Results at 8 years							
	Patients screened through 8 years	44,520	40,068	35,616	31,164	26,712	22,260
	Hip fractures averted through 8 years	490	441	392	343	294	245
	Other fractures averted through 8 years	267	240	214	187	160	134
Savings at 8 years*	Cost savings	\$10,499,625	\$9,449,662	\$8,399,700	\$7,349,737	\$6,299,775	\$5,249,812
	Acute care bed days freed up	11,264	10,137	9,011	7,885	6,758	5,632
	LTC admissions averted - low estimate	73	66	59	51	44	37
	LTC admissions averted - high estimate	122	110	98	86	73	61

*from averted hip fractures alone

TABLE 6: NEWFOUNDLAND AND LABRADOR - Impact of FLS on hip fracture costs, related acute care bed days, and LTC admissions

		100% coverage	90% coverage	80% coverage	70% coverage	60% coverage	50% coverage
Approximate number of FTE required		3.2	2.9	2.6	2.3	1.9	1.6
Results at one year							
	Patients screened in first year (2015)	3,654	3,288	2,923	2,558	2,192	1,827
	Hip fractures averted in 1 year	22	20	18	15	13	11
Savings at one year*	Cost savings	\$469,998	\$422,999	\$375,999	\$328,999	\$281,999	\$234,999
	Acute care bed days freed up	504	454	403	353	303	252
	LTC admissions averted - low estimate	3	3	3	2	2	2
	LTC admissions averted - high estimate	5	5	4	4	3	3
Results at 8 years							
	Patients screened through 8 years	30,420	27,378	24,336	21,294	18,252	15,210
	Hip fractures averted through 8 years	335	301	268	234	201	167
	Other fractures averted through 8 yrs	183	164	146	128	110	91
Savings at 8 years*	Cost savings	\$7,174,284	\$6,456,855	\$5,739,427	\$5,021,999	\$4,304,570	\$3,587,142
	Acute care bed days freed up	7,696	6,927	6,157	5,387	4,618	3,848
	LTC admissions averted - low estimate	50	45	40	35	30	25
	LTC admissions averted - high estimate	84	75	67	59	50	42

*from averted hip fractures alone

TABLE 7: NOVA SCOTIA - Impact of FLS on hip fracture costs, related acute care bed days, and LTC admissions

		100% coverage	90% coverage	80% coverage	70% coverage	60% coverage	50% coverage
Approximate number of FTE required		5.5	5.0	4.4	3.9	3.3	2.8
Results at one year							
	Patients screened in first year (2015)	6,242	5,618	4,993	4,369	3,745	3,121
	Hip fractures averted in 1 year	37	34	30	26	22	19
Savings at one year*	Cost savings	\$802,949	\$722,654	\$642,359	\$562,064	\$481,769	\$401,475
	Acute care bed days freed up	861	775	689	603	517	431
	LTC admissions averted - low estimate	6	5	4	4	3	3
	LTC admissions averted - high estimate	9	8	7	7	6	5
Results at 8 years							
	Patients screened through 8 years	51,645	46,481	41,316	36,152	30,987	25,823
	Hip fractures averted through 8 years	568	511	454	398	341	284
	Other fractures averted through 8 yrs	310	279	248	217	186	155
Savings at 8 years*	Cost savings	\$12,180,011	\$10,962,010	\$9,744,009	\$8,526,008	\$7,308,006	\$6,090,005
	Acute care bed days freed up	13,066	11,760	10,453	9,146	7,840	6,533
	LTC admissions averted - low estimate	85	77	68	60	51	43
	LTC admissions averted - high estimate	142	128	114	99	85	71

*from averted hip fractures alone

TABLE 8: ONTARIO - Impact of FLS on hip fracture costs, related acute care bed days, and LTC admissions

		100% coverage	90% coverage	80% coverage	70% coverage	60% coverage	50% coverage
Approximate number of FTE required		68	61	54	47	41	34
Results at one year							
	Patients screened in first year (2015)	76,627	68,965	61,302	53,639	45,976	38,314
	Hip fractures averted in 1 year	460	414	368	322	276	230
Savings at one year*	Cost savings	\$9,857,355	\$8,871,620	\$7,885,884	\$6,900,149	\$5,914,413	\$4,928,678
	Acute care bed days freed up	10,575	9,517	8,460	7,402	6,345	5,287
	LTC admissions averted - low estimate	69	62	55	48	41	34
	LTC admissions averted - high estimate	115	103	92	80	69	57
Results at 8 years							
	Patients screened through 8 years	632,788	569,509	506,230	442,952	379,673	316,394
	Hip fractures averted through 8 years	6,961	6,265	5,569	4,872	4,176	3,480
	Other fractures averted through 8 yrs	3,797	3,417	3,037	2,658	2,278	1,898
Savings at 8 years*	Cost savings	\$149,236,690	\$134,313,021	\$119,389,352	\$104,465,683	\$89,542,014	\$74,618,345
	Acute care bed days freed up	160,095	144,086	128,076	112,067	96,057	80,048
	LTC admissions averted - low estimate	1,044	940	835	731	626	522
	LTC admissions averted - high estimate	1,740	1,566	1,392	1,218	1,044	870

*from averted hip fractures alone

TABLE 9: PRINCE EDWARD ISLAND - Impact of FLS on hip fracture costs, related acute care bed days, and LTC admissions

		100% coverage	90% coverage	80% coverage	70% coverage	60% coverage	50% coverage
Approximate number of FTE required		1.0	0.9	0.8	0.7	0.6	0.5
Results at one year							
	Patients screened in first year (2015)	1,118	1,006	894	782	671	559
	Hip fractures averted in 1 year	7	6	5	5	4	3
Savings at one year*	Cost savings	\$143,774	\$129,397	\$115,019	\$100,642	\$86,264	\$71,887
	Acute care bed days freed up	154	139	123	108	93	77
	LTC admissions averted - low estimate	1	1	1	1	1	1
	LTC admissions averted - high estimate	2	2	1	1	1	1
Results at 8 years							
	Patients screened through 8 years	9,241	8,317	7,392	6,468	5,544	4,620
	Hip fractures averted through 8 years	102	91	81	71	61	51
	Other fractures averted through 8 yrs	55	50	44	39	33	28
Savings at 8 years*	Cost savings	\$2,179,308	\$1,961,377	\$1,743,446	\$1,525,516	\$1,307,585	\$1,089,654
	Acute care bed days freed up	2,338	2,104	1,870	1,637	1,403	1,169
	LTC admissions averted - low estimate	15	14	12	11	9	8
	LTC admissions averted - high estimate	25	23	20	18	15	13

*from averted hip fractures alone

TABLE 10: QUÉBEC - Impact of FLS on hip fracture costs, related acute care bed days, and LTC admissions

		100% coverage	90% coverage	80% coverage	70% coverage	60% coverage	50% coverage
Approximate number of FTE required		47	42	38	33	28	23
Results at one year							
	Patients screened in first year (2015)	53,052	47,747	42,442	37,137	31,831	26,526
	Hip fractures averted in 1 year	318	286	255	223	191	159
Savings at one year*	Cost savings	\$6,824,646	\$6,142,182	\$5,459,717	\$4,777,252	\$4,094,788	\$3,412,323
	Acute care bed days freed up	7,321	6,589	5,857	5,125	4,393	3,661
	LTC admissions averted - low estimate	48	43	38	33	29	24
	LTC admissions averted - high estimate	80	72	64	56	48	40
Results at 8 years							
	Patients screened through 8 years	438,660	394,794	350,928	307,062	263,196	219,330
	Hip fractures averted through 8 years	4,825	4,343	3,860	3,378	2,895	2,413
	Other fractures averted through 8 yrs	2,632	2,369	2,106	1,842	1,579	1,316
Savings at 8 years*	Cost savings	\$103,453,585	\$93,108,227	\$82,762,868	\$72,417,510	\$62,072,151	\$51,726,793
	Acute care bed days freed up	110,981	99,883	88,785	77,687	66,589	55,490
	LTC admissions averted - low estimate	724	651	579	507	434	362
	LTC admissions averted - high estimate	1,206	1,086	965	844	724	603

*from averted hip fractures alone

TABLE 11: SASKATCHEWAN - Impact of FLS on hip fracture costs, related acute care bed days, and LTC admissions

		100% coverage	90% coverage	80% coverage	70% coverage	60% coverage	50% coverage
Approximate number of FTE required		8	7	6	5	5	4
Results at one year							
	Patients screened in first year (2015)	8,510	7,659	6,808	5,957	5,106	4,255
	Hip fractures averted in 1 year	51	46	41	36	31	26
Savings at one year*	Cost savings	\$1,094,701	\$985,231	\$875,761	\$766,291	\$656,821	\$547,351
	Acute care bed days freed up	1,174	1,057	939	822	705	587
	LTC admissions averted - low estimate	8	7	6	5	5	4
	LTC admissions averted - high estimate	13	11	10	9	8	6
Results at 8 years							
	Patients screened through 8 years	70,197	63,178	56,158	49,138	42,118	35,099
	Hip fractures averted through 8 years	772	695	618	541	463	386
	Other fractures averted through 8 yrs	421	379	337	295	253	211
Savings at 8 years*	Cost savings	\$16,555,365	\$14,899,829	\$13,244,292	\$11,588,756	\$9,933,219	\$8,277,683
	Acute care bed days freed up	17,760	15,984	14,208	12,432	10,656	8,880
	LTC admissions averted - low estimate	116	104	93	81	69	58
	LTC admissions averted - high estimate	193	174	154	135	116	97

*from averted hip fractures alone

TABLE 12: TERRITORIES - Impact of FLS on hip fracture costs, related acute care bed days, and LTC admissions

		100% coverage	90% coverage	80% coverage	70% coverage	60% coverage	50% coverage
Approximate number of FTE required		0.3	0.3	0.2	0.2	0.2	0.1
Results at one year							
	Patients screened in first year (2015)	327	294	261	229	196	163
	Hip fractures averted in 1 year	2	2	2	1	1	1
Savings at one year*	Cost savings	\$42,039	\$37,835	\$33,631	\$29,427	\$25,224	\$21,020
	Acute care bed days freed up	45	41	36	32	27	23
	LTC admissions averted - low estimate	0	0	0	0	0	0
	LTC admissions averted - high estimate	1	0	0	0	0	0
Results at 8 years							
	Patients screened through 8 years	2,670	2,403	2,136	1,869	1,602	1,335
	Hip fractures averted through 8 years	29	26	23	21	18	15
	Other fractures averted through 8 yrs	16	14	13	11	10	8
Savings at 8 years*	Cost savings	\$629,791	\$566,812	\$503,833	\$440,854	\$377,875	\$314,896
	Acute care bed days freed up	676	608	540	473	405	338
	LTC admissions averted - low estimate	4	4	4	3	3	2
	LTC admissions averted - high estimate	7	7	6	5	4	4

*from averted hip fractures alone

References

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