ORIGINAL RESEARCH

Canadian Inpatient Orthogeriatric Models of Care: A Mixed Methods Survey of Facilitators and Barriers

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ABSTRACT

Background

Fragility fractures are a serious and common consequence of falls in older adults. Orthogeriatric models of care reduce mortality and morbidity, but, despite this evidence, orthogeriatric programs (OGPs) are not standardized across Canada. The aim of this study was to better understand the facilitators and barriers of OGPs across Canada.

Methods

Data on OGPs across Canada were gathered via email survey to all Canadian Geriatric Society (CGS) members and distributed April 1st to May 1st 2021. Respondents answered 15 questions, using SKIP LOGIC, and data analysis was conducted with Qualtrics^{XM} software.

Results

62 CGS members completed the survey. Respondents came from nine provinces/territories, with most being physicians from academic centres. 77% respondents indicated an existing OGP at their site, commonly an optional or automatic geriatrician consult. 23% indicated no formal OGP, of which 56% had an alternative service automatically consulted for older adults with fragility fracture, commonly internal medicine or a hospitalist. Responders indicated the most important factor in establishing an OGP is clinical leadership (56%, 10/18), and the most common barriers are lack of hospital prioritization and lack of funding (41%, 62/153).

Conclusions

The survey found that clinical leadership, hospital prioritization, and available funding are imperative to establishing OGPs. Limitations include the survey being distributed only to CGS members, a lower response rate, and respondents predominantly from academic centres in Ontario. Further qualitative data from other specialties (for example, orthopedics) and greater representation from community hospitals would be helpful to understand additional perceived barriers and facilitators.

Key words: older adults, fragility fractures, orthogeriatric programs, care models, osteoporosis

INTRODUCTION

Fragility fractures are a serious and common consequence of orthopaedic trauma in older adults. Elderly patients experience huge loss in quality of life, chronic pain, loss of mobility, and loss of independence. Fragility fractures are associated with increased morbidity and mortality, and heavy medical and economic burden.(1) Hip fractures, one of the most severe fragility fractures, are associated with a 25–35% mortality rate at one year after the incident fracture.(1) The incidence of fragility fractures is rising due to the ageing world population. The worldwide burden of disease and individual impact of fragility fracture are also expected to increase. Therefore, there's a global urgent need to improve fragility fracture care.(2)

Orthogeriatric models of care, where there is combined orthopaedic and geriatric medicine collaboration, are particularly beneficial for older patients with hip fracture. Orthogeriatric models are the standard of care in many countries. In the UK, clinical governance, national audit data, and financial incentives are driving change to more integrated models of care, which evidence shows results in improvements in quality indicators and outcomes.(3) The National Institute for Health and Care Excellence (NICE) has developed a guideline on the

management of hip fracture in adults in England.[4] In Scotland, the Scottish Standards of Care for Hip Fracture Patients were developed, and the Scottish Intercollegiate Guidelines Network (SIGN) has developed a guideline on the management of osteoporosis and prevention of fragility fractures.[5,6] Other health-care systems may benefit from adopting similar models of care from the UK experience.

Despite this evidence, orthogeriatric programs (OGPs) are not well-established or widespread in North America. Organized geriatric hip fracture programs are relatively new and there has been a recent growing interest in their implementation, but there are very few studies on barriers to implementation. One study that surveyed surgeons and physicians involved in geriatric fracture care in the United States identified such barriers as "lack of medical and surgical leadership, need for a clinical case manager, lack of anaesthesia department support, lack of hospital administration support, operating room time availability, and difficulty with cardiac clearance for surgery", as well as other important issues and ways to mitigate or overcome barriers.[7]

There's growing recognition around the importance of implementation of OGPs in Canada. A Canadian narrative review outlined challenges in post-hip fracture orthogeriatric care and strategies to meet quality indicators in care, which are anticipated to reduce recurrent fractures, improve mobility and outcomes, and reduce costs.[8] The 2023 Canadian guidelines for osteoporosis diagnosis and management focus on care for patients at high risk of fragility fractures. It highlights that osteoporosis management should be guided by the patient's absolute risk of fractures, assessment must consider that fracture increase the risk of further fractures, and treatment plan components like lifestyle modification and pharmacologic therapy should be individualized.[9]

Our study intends to establish a baseline knowledge of current care model practices in Canada. We aim to better understand the facilitators and barriers to establishing care models, to help inform program implementation and provide evidence-based practice across Canada. Our team created a nationwide mixed-methods survey with the primary aim to better understand existing OGPs and models of care across Canada, and perceived facilitators and barriers to program implementation. The survey's secondary aim was to collect information on osteoporosis diagnosis and treatment, as well as delirium and falls management in older adults' post-hip fracture.

METHODS

Study Design

Data were gathered via survey distribution. The list of email recipients was obtained through the Canadian Geriatric Society (CGS), an organization whose main membership consists of geriatricians, care of the elderly (COE), medical students and residents, other physicians, and allied health professionals focused on the health care of older adults. The survey was distributed via email to all 428 current members of the CGS with an outline of the research project purpose and investigators, for voluntary completion. All members must be health-care providers currently working in a hospital that provides inpatient care for patients 65 years and older admitted with fragility hip fracture. Once participants clicked on the link, they were brought to the Qualtrics^{XM} software website and asked to provide one-time consent prior to proceeding with the survey. The survey was active from April 1st to May 1st 2021 (four weeks). Respondents received one reminder email to complete the survey.

Data Collection

The survey was managed using Qualtrics^{XM} software (Qualtrics^{XM}, Provo, UT; www.qualtrics.com) and composed of 15 questions total. Questions were a combination of multiple choice or select all options that apply. The survey started by asking demographic questions about the respondent, their workplace, and qualitative information on OGPs. Next, the survey asked whether an OGP existed at the respondent's site or not. Depending on the answer, the next 13 questions were answered using SKIP LOGIC. Respondents who said 'yes' received questions about facilitators; respondents who said 'no' received questions about barriers. Lastly, the survey asked questions regarding osteoporosis diagnosis and treatment along with delirium and falls management of all respondents. Upon completion, the survey was closed to the participant. Incomplete surveys resulted in a reminder email sent weekly after initiation to complete the survey.

Data Analysis

Qualtrics^{XM} software provided data analysis of the survey responses with the primary outcome of gathering quantitative and qualitative information about OGPs across Canada. Qualitative data were individually analyzed by DT.

RESULTS

Demographics and General Values

Five hundred and ten (510) CGS members read the email invitation to participate in the survey. Of the 69 (13.5%, 69/510) CGS members who initiated the survey, 62 (90%, 62/69) completed the survey and were included in the data analysis. Respondents came from nine out of the 13 provinces and territories in Canada, with 50% of all respondents coming from Ontario. Eighty-four per cent (84%, 52/62) of respondents were geriatricians or care-of-the-elderly physicians and 92% were from academic centres (Table 1). Ninety-seven per cent (97%) of all respondents felt orthogeriatrics and falls and delirium prevention/assessment were very important or important.

Facilitators

Seventy-seven per cent (77%, 48/62) respondents indicated at least one existing OGP at their site ("select all that apply" question), commonly an optional or automatic geriatrician consult. Additional OGPs identified were expedited transfer to

specialized geriatric rehab units, transfer to other rehab units, and fracture liaison service or shared care between orthopedics and geriatric medicine. Multiple participants indicated more than one existing OGP. Eighty-eight per cent (88%, 16/18) of respondents were very or somewhat satisfied with their institution's OGP. Respondents also provided qualitative feedback about what they liked most about their program and areas of improvement in their program. Common positive themes were the automatic geriatric medicine consultation, early and close collaboration between orthopaedics and geriatrics, and optimization of patient care. Some areas of improvement included expanding beyond hip fractures, ensuring therapy for osteoporosis is continued after discharge, and adding additional osteoporosis medications to hospital formulary. Fifty-six per cent (56%, 10/18) of respondents felt the most important facilitator in establishing an OGP was clinical leadership. Other facilitators included hospital initiative, hiring of a fracture liaison coordinator, evidence-based medicine practices, among others (Table 2).

Barriers

Twenty-three per cent (23%, 14/62) of respondents indicated no formal OGP program at their workplace. Of these, 56% (39/70) had an alternative service automatically consulted for older adults with fragility fracture ("select all that apply" question), commonly internal medicine or a hospitalist, for older adults with fragility fracture. Forty-four per cent (44% 31/70) had no alternative service automatically consulted for older adults with fragility fracture. About 41% (62/153) of respondents believed the most common barriers preventing OGPs ("select all that apply" question) were lack of hospital prioritization and lack of funding. This was followed by lack of collaboration between orthopaedic surgery and geriatrics, and lack of personnel to fill the champion role. Other barriers were lack of leadership, lack of expertise in program implementation, lack of surgical availability, and conflicting guidelines in orthogeriatric care. Some comments by respondents include "challenges in maintaining a program", "lack of understanding re: specialized geriatric care", "hospital administration unaware of benefits", "lack of Geriatricians", "challenges with competing services and funding", "fear of orthopaedics to lose bed management decisions", "not enough staff trained in specialized geriatric services", "busy core programs and lack of autonomous providers". Both questions asking alternative services and details about barriers to OGPs were "select all that apply" questions (Table 3).

Factors

All respondents ranked the importance of factors in implementing an OGP (Figure 1; 1=most important and 7=least important). On average, the factors from most to least

TABLE 1.
Demographics (N=62)

	Count	*Percentage*
Province/Territory of Work		
Ontario	31	50.00
Quebec	7	11.29
Manitoba	1	1.61
Saskatchewan	1	1.61
British Columbia	3	4.84
Alberta	5	8.06
Nova Scotia	7	11.29
Newfoundland and Labrador	3	4.84
New Brunswick	4	6.45
Prince Edward Island	0	0.00
Nunavut	0	0.00
Yukon	0	0.00
Northwest Territories	0	0.00
Hospital Affiliated With Academic Institution		
Yes	57	91.94
No	5	8.06
Type of Health-Care Provider		
Nurse (NP, RN, RPN)	1	1.61
Primary Care Physician	2	3.23
Care of Elderly Physician	11	17.74
Geriatrician	41	66.13
Allied Health (OT, PT, SLP)	2	3.23
Pharmacist	1	1.61
Other	4	6.45

TABLE 2.
Existing orthogeriatric programs and their facilitators

	Count	*Percentage*
Existing OGPs		
Optional Geriatric consult	33	33.33
Automatic Geriatric consult	17	17.17
Orthopaedic & Geriatric share care (shared MRP)	5	5.05
Expedited transfer to specialized geriatric rehabilitation unit	9	9.09
Expedited transfer to other rehab unit	8	8.08
No formal program	14	14.14
Other	5	5.05
Fraction Liaison Service	8	8.08
Details About Facilitators of Current Orthogeriatric Programs (total N=18)		
Satisfaction		
Very satisfied	10	55.56
Somewhat satisfied	6	33.33
Neutral	2	11.11
Somewhat dissatisfied	0	0.00
Very dissatisfied	0	0.00
Most Important in Helping to Establish Orthogeriatric Programs		
Clinical leadership	10	55.56
Hospital initiative	2	11.11
Evidence based medicine practices	1	5.56
Other	3	16.67
Hiring of a fracture liaison coordinator	2	11.11
Patient interest	0	0.00

important are harm reduction, quality improvement, resources required, readmission prevention, cost to hospital, and competing hospital initiatives (Table 4).

TABLE 3.
Alternative services and barriers to orthogeriatric programs in workplaces without formalized programs

	Count	*Percentage*
Service Automatically Consulted for Older Adults With Hip Fracture		
Internal Medicine	9	12.86
Hospitalist	10	14.29
Care of the Elderly Physician	3	4.29
Physiatry	0	0.00
Nurse Practitioner	4	5.71
None	31	44.29
Other	13	18.57
Details About Barriers to Orthogeriatric Programs		
Belief Preventing Orthogeriatric Programs		
Lack of leadership	15	9.80
Lack of expertise in program implementation	10	6.54
Lack of collaboration between Orthopedic surgery and Geriatrics	23	15.03
Lack of funding	30	19.61
Not a hospital priority	32	20.92
Other	15	9.80
Conflicting guidelines on orthogeriatric care	2	1.31
Lack of personnel to fill champion role	23	15.03
Lack of surgical availability	3	1.96

Osteoporosis, Delirium, and Falls

Ninety-five per cent (95%, 58/61) of all respondents were very confident or confident in their ability to diagnose osteoporosis in the setting of a fragility fracture. The most common barriers to prescribing osteoporosis treatment in hospitals ("select all that apply" question) were uncertainty of when to initiate treatment post-fracture and continuity of treatment post-discharge. This was followed by medication side effects, uncertainty of which medication to use, and incomplete blood work. Some comments by respondents about barriers to initiating pharmacologic treatment for osteoporosis post-hip fracture include "cost of alternatives", "lack of comfort/knowledge on initiating therapy", "attitude of not my problem/lack of ownership of prescribing responsibilities", "medicine physicians not routinely involved in care", "lack of expertise from ortho and not enough implication from geriatrics", "no preventative care

TABLE 4.
Factors in establishing an orthogeriatric program

	Mean	*SD*	*Var*
Importance in Establishing an Orthogeriatric Programs			
Cost to hospital	4.33	1.43	2.06
Resources required	3.18	1.28	1.65
Quality improvement	2.67	1.59	2.52
Readmission prevention	3.38	1.36	1.84
Harm reduction	2.37	1.41	2.00
Competing hospital initiatives	5.15	1.45	2.09
Other	6.92	0.64	0.41

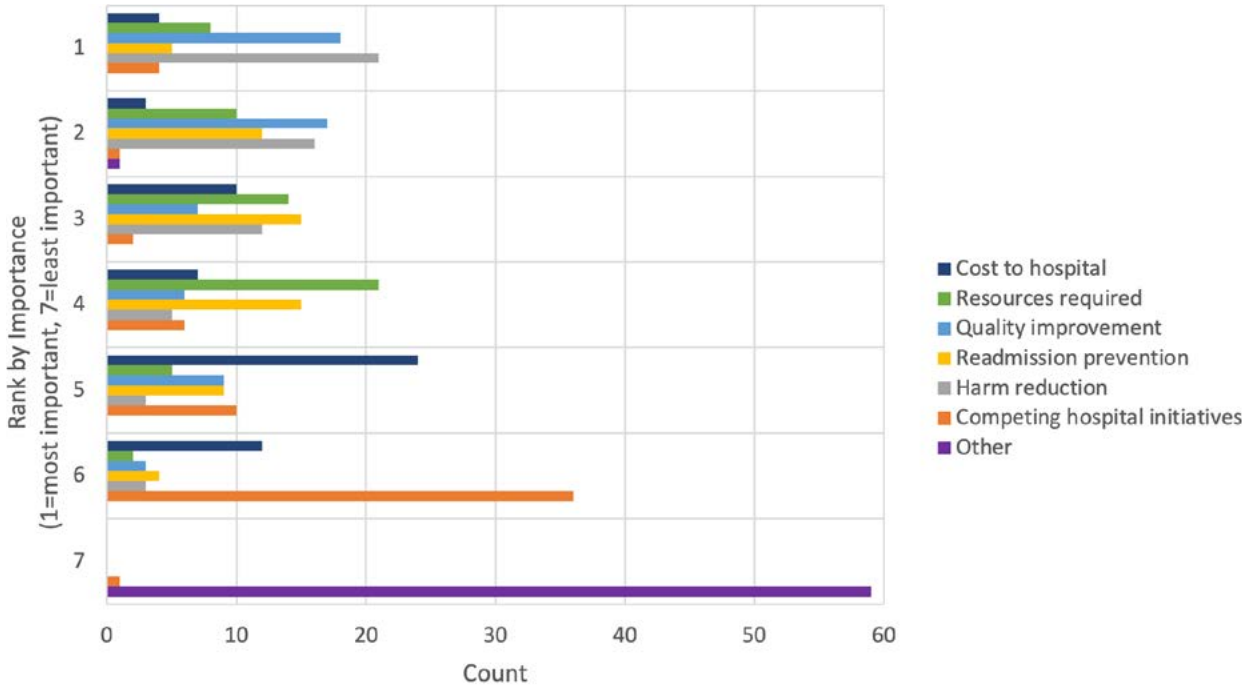

FIGURE 1. Factors in establishing an orthogeriatric program
1-Most important, 7-Least important.

pathways", "CKD results in contraindication to meds", "concern for rebound effect if medication stopped", "barriers to appropriate administration of bisphosphonates", and "lack of Denosumab or Risedronate DR on formulary". Additionally, respondents felt the most appropriate service to initiate osteoporosis treatment in hospital was orthopaedics or geriatric medicine (Table 5). Ninety-seven per cent (97%) of all respondents felt it was very important or important to receive delirium prevention while in hospital. Seventy-four per cent (74%) felt it was very important or important to receive falls risk assessment while in hospital.

TABLE 5.
Barriers to treatment of osteoporosis post fragility fracture

	Count	*Percentage*
Confidence in Diagnosing Osteoporosis Older Adult With Fragility Hip Fracture		
Very confident	39	63.93
Confident	19	31.15
Moderately confident	3	4.92
Somewhat confident	0	0.00
Not confident	0	0.00
Confidence in Starting Pharmacologic Treatment in Older Adult With Osteoporosis		
Very confident	36	58.06
Confident	23	37.10
Moderately confident	1	0.02
Somewhat confident	1	0.02
Not confident	1	0.02
Most Appropriate Service to Start Pharmacologic Treatment		
Geriatric Medicine	19	30.65
Other Medicine service (Internal Medicine, Hospitalist)	7	11.29
Orthopaedic Surgery	12	19.35
Rehab Unit	8	12.90
Family Doctor after discharge	7	11.29
Other	8	12.90
Not Sure	1	1.61
Barriers to Starting Pharmacologic Treatment in Hospital		
Uncertain which medication to use	16	8.89
Medication side effects	18	10.00
Uncertain when to start treatment post-hip fracture	33	18.33
Treatment futility given age/frailty	12	6.67
Difficulty obtaining consent	9	5.00
Lack of Bone Mineral Density (BMD) data	14	7.78
Concern over post-discharge continuity of treatment	26	14.44
Incomplete blood work (e.g., Vitamin D level)	16	8.89
Other	15	8.33
Medications not on formulary (please specify)	14	7.78
Patient resistance	6	3.33
Not sure	1	0.56

DISCUSSION

The importance of post-fracture care in Canada is well recognized.[8,9] Several orthogeriatric fracture care models have been described in the literature. Among this heterogenous group of studies, frequently reported outcomes were hip fracture patients' length of stay (LOS), time to surgery (TTS), activities of daily living (ADL) outcomes, complications, in-hospital mortality, and long-term mortality. The overall trend is favourable towards an integrated, multi-disciplinary model consisting of an orthopaedic ward with integrated care from a geriatrician.[10,11,12] Orthogeriatric models of care allow for a holistic assessment of the older adult including consideration of falls, polypharmacy, frailty, cognition, nutrition, pressure area care, osteoporosis assessment, and supporting rehabilitation. Evidence shows reduced LOS and mortality amongst hip fracture patients managed with a recognized model of orthogeriatric care, but interpretation of findings is limited due to the heterogeneity of studies.[11,12] Furthermore, there is currently insufficient evidence on which orthogeriatric care model type—a geriatrician consultant service or orthopedic surgeon consultant service—is superior.[11]

This study is the first to explore and aim to better understand the facilitators and barriers to implementing OGPs across Canada. Although most respondents felt orthogeriatric care was important to patient care, orthogeriatric care was not a standard of care in all hospitals. OGP models vary across Canada, with multiple different models being used. The survey found that respondents indicated the most important factor in helping to establish an OGP is clinical leadership, and the most common barriers preventing OGPs were lack of hospital prioritization and lack of funding. The next step is to identify and explore strategies to overcome these barriers. The significance and advantages of OGP models will need to be highlighted and promoted, with the goal of persuading various stakeholders and decision-makers to ultimately make change in the health-care system.

Limitations of the survey were that the survey had a low response rate, was distributed only to CGS members (limiting the population to being predominantly geriatricians from academic centres), and limited to predominantly respondents from Ontario. The data are also missing one response to the question asking about confidence in diagnosing osteoporosis older adult with fragility hip fracture.

There is still limited evidence evaluating which of the varying OGP model types and alternative services used across Canada is superior. In the future, collecting survey data from other specialties, such as orthopedic surgery and other sub-specialties involved in co-management including internal medicine and hospitalists, would be helpful to understand additional perceived barriers and facilitators, and to capture the prevalence of co-management models with further specialties in Canada.

CONCLUSION

The survey established the current role of geriatricians in OGPs in Canada, and identified facilitators and barriers to developing OGPs in a Canadian context. The survey found that clinical leadership, ensuring hospital prioritization, and available funding are imperative to establishing OGPs.

Evidence for OGPs is well-established. There is increasing movement towards implementing OGPs in Canada, initially with provincial guidelines such as *Health Quality Ontario Hip Fracture Quality Standards* and *Alberta Bone and Joint Hip Fracture Care Toolkit*. The recently published Canadian position paper advocating for orthogeriatric care post-hip fracture presents a national call to action for OGP implementation. As we move towards knowledge translation and building OGP services, knowledge of Canadian facilitators and barriers will be important for planning by policy stakeholders, administrators, and clinical leaders.

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CONFLICT OF INTEREST DISCLOSURES

We have read and understood the *Canadian Geriatrics Journal*'s policy on conflicts of interest disclosure and declare the following interests: JT has received grants and honorarium from Amgen, and is on the advisory board for Amgen. AP has received grants and honorarium from Amgen and is on the advisory board for Amgen and Paladin Labs. DT, YL and GI have no conflicts of interest to declare.

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