

An Emergency Medical Technician Administered Falls-Assessment Protocol to Safely Identify Elderly Adults with Non-Urgent Conditions that may Avoid Transport to Emergency Department



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ABSTRACT

Background

Approximately two-thirds of patients transported to emergency departments (ED) for a fall are discharged from the ED without urgent treatment. This pilot study tests the feasibility of implementing a pre-hospital falls-assessment protocol performed by emergency medical technicians (EMTs) to determine whether a patient who fell needs an ED assessment or could be referred safely to a community resource.

Methods

The protocol was administered by trained EMTs to adults aged ≥ 65 after a fall between October 2019 and March 2020 in Sherbrooke (QC). All patients were transported to ED regardless of protocol outcome (transport recommended/not recommended). The objective was to assess if EMTs could complete the protocol and make the appropriate decision concerning the transport to ED. Secondary objectives aimed to assess the accuracy in identifying patients who do not require transport, and to measure the impact on avoidable ambulance transports.

Results

A total of 125 EMTs interventions were carried out: 17 patients were in the transport not recommended group, representing 14% of transport to hospital for falls-related EMTs calls that could be possibly avoided. Of these, 110 were transported to ED. Mean duration of on-site EMTs interventions was of 31 minutes. Forty-seven patients were admitted, mostly for

infections and fractures, including four in the transport not recommended group.

Conclusions

This study showed that EMTs can administer a falls-assessment protocol aimed at identifying patients that need an ED evaluation. Results permitted to amend the protocol before the second phase of the project evaluating the safety of the protocol.

Key words: prehospital, redirection, falls, seniors

INTRODUCTION

Falls are the leading cause of injuries in older adults.⁽¹⁾ In Canada, 20 to 30% of older adults (≥ 65 years old) fall at least once per year.⁽²⁾ While falls can be the manifestation of a life-threatening condition, most of them are not associated with urgent conditions.⁽³⁾ Among older adults who consult for a potential fall-related injuries, 67% are treated in an emergency department (ED).⁽²⁾ However, up to 70% of these patients are discharged from the ED without further treatment.^(1,4) These short visits to the ED are associated with potential iatrogenic risks, such as delirium, immobilization and exposition to painful procedures, and add a considerable societal and financial burden on a strained health system.^(5,6) It has been postulated that this subset of patients without urgent medical conditions could be better served by community-based resources such as dedicated fall assessment clinics or primary care physician visits.⁽⁶⁾

Paramedics are frequently the first medical contact after a fall.⁽⁷⁾ Elsewhere in the world, programs have been implemented to integrate alternative care pathways in which paramedics orient patients to different resources (ED or community-based resources) after a fall.⁽⁸⁻¹⁰⁾ However, these programs mostly involve paramedics who have received advanced training, including some geriatric-specific content. Their applicability in the province of Quebec—in which pre-hospital care is delivered by emergency medical technicians (EMT)s who have a less extended training oriented towards life-threatening emergencies—is unknown.

With a multidisciplinary team, we developed an EMT falls-assessment protocol that could potentially be implemented to identify which older adults have a low risk of requiring urgent medical assessment after a fall in the community, and who can be safely referred to a community resource after the EMT assessment.

This was a pilot study to describe the elaboration of an EMT-administered falls-assessment protocol and test the feasibility of application by the EMTs. The primary objective of this study was to determine if EMTs could carry out the protocol and establish the appropriate decision (transport recommended or not recommended). The secondary objectives were to obtain preliminary data on the safety of not recommending transport (i.e., no conditions leading to hospitalization and/or death), and to measure the potential impact of the new protocol on lowering ambulance transportation. The results of this study will be used in the second phase of the project which will assess the safety of the utilization of the falls-assessment protocol in a wider-scale implementation.

METHODS

Study Setting

In the province of Quebec, there is a single number to request emergency assistance (911). If the emergency is of a medical nature, two EMTs are thereafter deployed to intervene. Pre-hospital care is delivered by primary care EMTs with a collegiate-level training. Their role, in contrast to more advanced paramedics elsewhere in the world, is one of assessment, stabilization, and transportation. Assessments and management are protocolized under the supervision of a medical regional director. Transport to an ED is currently the standard of care following any emergency medical services (EMS) intervention, the only exception being if the patient explicitly refuses to be transported. Of about 30,000 EMS transports to ED annually, roughly 10% in Sherbrooke are for falls. Local EMS has approximately 160 EMTs on staff and operates in an urban and suburban setting. The study was conducted in Sherbrooke, Québec, Canada, as a partnership between the EDs of the Centre Hospitalier Universitaire de Sherbrooke and local EMS.

Protocol Development

To integrate fall assessment into the existing local EMT protocol framework, a multidisciplinary round-table

committee was formed to develop a standardized falls-assessment evaluation protocol. It was named TRAU-6, in accordance with the existing provincial intervention protocol repertoire. The committee included a geriatric internist, three emergency physicians, a physiotherapist, a paramedic instructor, and two patient-partners.

Validation Process

Methodologic standards for the development of emergency clinical decision rules warrant scientific derivation based on pre-existing tool.⁽¹¹⁾ However, the absence of robust pre-hospital data relevant to our clinical context rendered such a process impossible. Thus, the following steps were taken to validate the protocol: A narrative literature review was undertaken to identify pertinent interventions to include in the protocol. Subsequently, draft versions were reviewed three times by the committee in round-table sessions until a unanimous consensus was obtained.

The final version of TRAU-6 was based on fall-evaluation guidelines and included a 12-lead ECG and screening for orthostatic hypotension, hypoglycemia, delirium using the CAM,⁽¹²⁾ neurologic deficits with the Cincinnati scale,⁽¹³⁾ gait abnormality with a modified Timed-Up and Go (TUG),⁽¹⁴⁾ a history of previous falls within the last seven days, head trauma or any other condition suggesting another protocol would be more appropriate. Sociodemographic information, type of domicile, and the use of a walking aid were also collected. The duration of the on-site EMS intervention before transport was also collected.

Participant Selection and EMT Training

A group of 36 EMTs, identified by their supervisors as showing interest in advanced training, was selected to receive training on the TRAU-6 protocol. They attended a one-day seminar in October 2019 which included a half day of courses given by members of the expert committee on falls risk factors and frequent associated conditions, as well as a half day of simulation workshops with patient actors to practice and standardize protocol administration.

Eligible Patients

The protocol targets all adults aged 65 or older who have called 911 for EMS assistance following a fall from standing in the community. In the presence of defined instability or potential instability criteria, such as hypotension, cyanosis, respiratory distress, chest pain, bleeding, altered level of consciousness or suspected stroke, patients were automatically classified as requiring hospital transport and were excluded from TRAU-6 administration. Patients undergoing palliative care were also excluded.

Data Collection and Processing

Trained EMTs administered the falls-assessment protocol to all eligible patients. After administering the protocol, the EMTs determined if the patients needed to be transported in the ED or could be referred to a community falls prevention

program (transport not recommended group) according to protocol criteria. In the presence of one abnormal finding, or if the patient's situation changed during the assessment, the TRAU-6 protocol was interrupted and the EMT switched for a protocol meeting the patient's needs, or the patient was immediately brought to ED. Data were recorded by EMT. Thereafter, all patients were transported to the ED regardless of protocol outcome.

The following relevant in-hospital data pertaining to the related ED visit were collected retrospectively: ED length of stay, ED disposition (discharge from ED or hospital admission), disposition at discharge from hospital and in-hospital mortality. Clinical data such as the Charlson comorbidity index, antiplatelet and anticoagulant use, the presence of neurocognitive disorders, imaging and laboratory tests prescribed during ED visit, diagnosis at discharge from ED or hospital admission, as well as the presence of an urgent medical condition requiring timely treatment (acute coronary syndrome, sepsis, hypoglycemia, stroke, fracture, etc.) were collected. Finally, 30-day mortality and subsequent EMS transport in the seven days following the fall were recorded. We collected in-hospital data to evaluate the safety of the falls-assessment protocol in detecting time-sensitive conditions requiring urgent transport to the ED. All medical data were collected using an anonymous identifier using the REDCap platform (Research Electronic Data Capture [REDCap], www.project-redcap.org) and stored on secured servers.

Study Period and Data Analysis

Data were collected from October 2019 and it was planned to collect until October 2021 in order to have sufficient data for safety analysis. Due to the COVID-19 pandemic, the use of the TRAU-6 protocol was stopped prematurely in March 2020, to avoid increased EMT exposure relative to the extended evaluation necessary to complete the protocol. Data already collected were used to calculate descriptive statistics and to determine the feasibility of wider-scale implementation of the EMT assessment protocol. Data are presented using means, medians, and frequency measures, where appropriate.

Ethics Approval

The Comité d'éthique du CIUSSS de l'Estrie—CHUS have reviewed and approved the study protocol (project no. MP-31-2021-3528). The need for consent was waived by the approving ethics committee.

RESULTS

During the study period, a total of 125 EMT interventions for falls were carried out using the protocol TRAU-6. Characteristics of all included patients depending on whether EMTs would have recommended transport to the ED or consultation with community-based falls prevention resources are presented in Table 1. The average patient was aged 84.3 years and 64.8% were males. Most patients lived alone in private dwellings, and over half used a walking aid.

Patients' pre-hospital information is presented in Table 2. Mean EMT evaluation duration was 31.4 minutes (SD = 11.4 min) for all patients. Mean intervention times were 30.9 minutes in the transport recommended group and 25.1 minutes in the transport not recommended group. Following the evaluation, transport to hospital would have been recommended in 86% of the patients (n=108) and reference to community-based resources would have been recommended in 14% of the patients (n=17). A total of 14 patients (11.2%) refused transport to the hospital, respectively, seven in each group.

All patients in the transport recommended group had abnormal findings on EMT evaluation. Of the 17 patients in the transport not recommended group, two had abnormal findings on EMT evaluation and were thus misclassified by EMTs. For the 119 patients for whom the information was available, six required another EMS intervention in the following seven days respectively, five in the transport recommended group and one in the transport not recommended group. Within the 30 days following the initial EMS intervention, eight patients in the transport recommended group and two in the transport not recommended group died.

Among the 47 patients admitted to hospital, four were in the transport not recommended group (Table 3). Another patient in the transport not recommended group was transferred from the ED to a trauma centre for admission. Principal ED diagnoses prompting admission were infection (nine hospitalized) followed by fractures (six hip fractures and 15 other fractures). Three patients were admitted for orthostatic hypotension and syncope, three for multifactorial falls, two for acute stroke, and two for acute coronary syndrome.

Upon further analysis of each case, it was determined that two patients had abnormal findings on pre-hospital assessment and thus were misclassified erroneously by the EMTs and transport should have been recommended. Thus, correct recommendation was given by EMTs in 98.6% of cases.

In the transport not recommended group, five patients were ultimately admitted to hospital (including one after interhospital transfer), and two of these died in the 30 days following admission. Upon further examination of ED and hospital information, it was determined that one patient had a fever at the ED though no temperature had been taken during pre-hospital intervention. This patient died of complications of pneumonia. Another of this subgroup was admitted for diabetic emergency and had a capillary glucose of 27.9 mmol/l on pre-hospital assessment.

As for the two other patients in this group who were admitted to hospital, one was admitted for pelvic fracture. On review of evaluation, pelvic pain limited pre-hospital assessment, which is a criterion for transport, and as such should have been classified as "transport recommended". Another was admitted for hypertensive intracerebral hemorrhage and, upon review of pre-hospital assessment, patient was noted to have altered mental status but final evaluation of EMS technicians was "transport not

recommended". Care will be taken to emphasize the need for transport if any anomaly is detected during protocol administration in the following phase of our study for safety analysis. The future final version of the evaluation will be embedded in the electronic system of the EMS, the classification will be done then automatically according to what has been previously entered by EMTs, avoiding this kind of error. The remaining patient was admitted for decompensated heart failure, and unfortunately contracted influenza during hospitalization and died. A thorough examination of the pre-hospital assessment revealed no clues suggestive of this condition which was identified only by the ED physician evaluation.

DISCUSSION

This study, though based on similar interventions elsewhere in the world,^(9,15) is the first of its kind in the province of Quebec. More comprehensive EMT assessment has the potential to implement change in pre-hospital care trajectories for elderly persons after a fall.

EMT intervention lasted an average of 31 minutes, which is 12 minutes more than median local intervention time for minor trauma.⁽¹⁶⁾ However, we believe that if this increased intervention time on-site can prevent a costly and time-consuming ED visit, it is a net benefit to the patient and the health-care system. However, our study was not

TABLE 1.
Patients' characteristics

	<i>Transportation Recommended</i>	<i>Transportation not Recommended</i>	<i>All Patients</i>
	<i>N=108</i>	<i>N=17</i>	<i>N=125</i>
Age, years: mean (SD)	83.9 (7.9)	84.9 (7.7)	84.3 (7.9)
Sex, n (%)			
F	37 (34.3)	9 (52.9)	45 (36.0)
M	70 (64.8)	8 (47.1)	78 (62.4)
Unknown/missing	1 (0.9)	0	2 (1.6)
Charlson Score, mean (SD)	6.2 (2.0)	7.7 (2.4)	6.4 (2.0)
Score missing, n	7	6	
Living Arrangement, n (%)			
Live alone	68 (62.9)	9 (52.9)	77 (61.6)
Live with spouse/family/friend	27 (25.0)	3 (17.7)	28 (22.4)
Unknown/missing	12 (11.1)	5 (29.4)	17 (16.0)
Type of Domicile, n (%)			
Private dwelling	50 (46.3)	7 (41.2)	57 (45.6)
Residence for independent seniors	29 (26.9)	4 (23.5)	33 (26.4)
Residence for dependent seniors	24 (22.2)	6 (35.3)	30 (24.0)
Long-term care centre	4 (3.7)	0	4 (3.2)
Unknown/missing	1 (0.9)	0	1 (0.8)
Use of Walking Aid, n (%)			
Yes	56 (51.9)	7 (41.2)	63 (50.4)
No	23 (21.3)	3 (17.6)	26 (20.8)
Unknown/missing	29 (26.8)	7 (41.2)	36 (28.8)
Use of Antiplatelet, n (%)			
Yes	38 (35.2)	4 (23.5)	42 (34.4)
No	62 (57.4)	7 (41.2)	69 (56.0)
Unknown/missing	7 (6.4)	6 (35.3)	13 (9.6)
Use of Anticoagulant, n (%)			
Yes	29 (26.9)	2 (11.8)	31 (24.8)
No	73 (67.6)	9 (52.9)	82 (65.6)
Unknown/missing	6 (5.5)	6 (35.3)	12 (9.6)
Presence of Polypharmacy, n (%)			
Yes	80 (74.1)	9 (52.9)	89 (71.2)
No	19 (17.6)	2 (11.8)	21 (16.8)
Unknown/missing	9 (8.3)	6 (35.3)	15 (12.0)

sufficiently powered to determine whether this represents a significant difference.

Of the 111 patients assessed and who were transported to ED, 17 would have been referred to a community-based falls prevention resource rather than being transported to the ED. This means that 154% of transports to hospital for falls-related EMS calls would have been avoided. This reduction is considerably lower when compared to a 2018 USA-based

study,⁽¹⁷⁾ where a EMT clinical decision tool helped to avoid 66% of ambulance transports for falls. However, several key differences may explain this discrepancy. The aforementioned study was conducted among residents of assisted-living facilities only, which represented only a minority (25%) of subjects in our study. Many care facilities have policies for mandatory EMS calls for falls, whereas older adults living in the community may be less likely to report a fall or seek

TABLE 2.
Patients' pre-hospital information

	<i>Transportation Recommended</i>	<i>Transportation Not Recommended</i>	<i>All Patients</i>
	<i>N=108</i>	<i>N=17</i>	<i>N=125</i>
Duration of Intervention (minutes), mean (SD)	30.9 (11.4)	25.1 (14.5)	31.4 (11.4)
Missing data, n	1	3	
Occurrence of the Fall			
Inside dwelling	96 (88.9)	15 (88.2)	111 (88.8)
Public place	2 (1.9)	0	2 (1.6)
Outside	8 (7.4)	0	8 (6.4)
Unknown/missing	2 (2)	2 (11.7)	4 (3.2)
Fall Height			
Bed	12 (11.1)	1 (5.9)	13 (10.4)
Chair	5 (4.6)	1 (5.9)	6 (4.8)
Person's height	82 (75.9)	13 (58.8)	95 (76)
> Person's height	4 (3.7)	0	4 (3.2)
Other	1 (0.9)	0	1 (0.8)
Unknown/missing	4 (3.7)	2 (11.7)	6 (4.8)
Capillary glycaemia (mmol/L), mean (SD)	7.6 (3.2)	9.4 (5.8)	7.9 (6.9)
<i>Items From The EMTs Evaluation</i>			
Criteria of Instability, n (%)			
None	88 (81.4)	10 (58.8)	98 (78.4)
At least one criteria met	13 (12.0)	1 (5.9)	14 (11.2)
Unknown/missing	7 (6.5)	6 (35.3)	13 (10.4)
Criteria for Immobilization, n (%)			
None	81 (75)	11 (64.7)	92 (73.6)
At least one criteria met	20 (18.5)	0	20 (16.0)
Unknown/missing	7 (6.5)	6 (35.3)	13 (10.4)
ECG completed, n (%)	103 (95.4)	15 (88.2)	118 (94.4)
Presence of atrial fibrillation	16	0	16
Neurologic deficits with Cincinnati score, n (%)	4 (3.7)	0	4
Suspicion of delirium with CAM +, n (%)	9 (8.3)	0	9
TUG-m, n (%)			
Test - normal	31 (28.4)	12 (70.6)	43 (34.4)
Test- abnormal	13 (12.0)	0	13 (10.4)
Test not completed	64 (59.3)	5 (29.4)	69 (55.2)
Orthostatic Hypotension, n (%)			
No significant decrease in blood pressure	21 (19.4)	8 (47.1)	29
Significant decrease in blood pressure	12 (11.1)	1 (5.9)	13 (10.4)
Orthostatic changes not measured	75 (69.4)	8 (47.1)	83
Previous fall within the last 7 days, n (%)	26 (24.1)	2 (11.8)	28 (22.4)

TABLE 3 (part 1 of 2).
 Patients' in-hospital information

	<i>Transportation Recommended</i>	<i>Transportation Not Recommended</i>	<i>All Patients</i>
	<i>N=100</i>	<i>N=11</i>	<i>N=111</i>
ED LOS, in hours, mean (SD)	9.5 (9.4)	9.6 (7.9)	9.5 (6.0)
Presence of fever during triage (>37.5°C), n (%)	11 (11)	1 (9.1)	16 (14.4)
Head imaging completed, n (%)	59 (59)	5 (45.5)	64 (57.6)
Spine imaging completed, n (%)	25 (25)	2 (18.2)	27 (24.3)
Other type of imaging completed, n (%)	71 (71)	6 (54.5)	77 (69.4)
Traumatic Consequences of the Fall, n (%) ^a			
None	77 (77)	8 (72.7)	85 (76.6)
Head trauma bleeding	0	0	0
Fracture requiring surgery / immobilization	12 (12.0)	0	12 (10.8)
≥3 costal fractures	1 (1)	0	1 (0.9)
Pneumothorax	0	0	0
Hemothorax	0	0	0
Intra-abdominal hemorrhage	0	0	0
Pelvic fracture	1 (1.0)	1 (9.1)	2 (1.8)
Surgery 72 h post fall	7 (7.0)	0	7 (6.3)
Intensive care 72 h post fall	2 (2.0)	2 (18.2)	4 (3.6)
Death 72 h post fall	4 (4.0)	1 (9.1)	5 (4.5)
Other	2 (2.0)	0	2 (1.8)
Conditions that Potentially Precipitated the Fall, n (%) ^a			
None	80 (80.0)	8 (72.7)	88 (80.0)
IV antibiotic to treat infection	8 (8.0)	1 (9.1)	9 (8.2)
Acute coronary syndrome	1 (1.0)	0	1 (0.9)
Acute stroke	2 (2.0)	1 (9.1)	3 (2.7)
Pulmonary embolism	0	0	0
Aortic dissection	0	0	0
Tamponade	0	0	0
Intoxication	0	0	0
Condition requiring surgery 72h post fall	2 (2.0)	0	2 (1.8)
Condition requiring intensive care admission 72h post fall	2 (2.0)	1 (9.1)	3 (2.7)
Condition leading to death 72h post fall	2 (2.0)	1 (9.1)	3 (2.7)
Other	10 (10.0)	1 (9.1)	11 (10.0)
Professionals Consulted, n (%) ^a			
None	34 (34.0)	5 (45.4)	39 (35.1)
Geriatric nurse	19 (19.0)	1 (9.1)	20 (18.0)
Liaison nurse	0	0	0
Social worker	13 (13.0)	0	13 (11.7)
Physiotherapist	57 (57.0)	6 (54.5)	63 (56.7)
Other	18 (18.0)	2 (18.2)	20 (18.0)
Post ED Diagnosis, n (%)			
Multifactorial fall	34 (34.0)	1 (9.1)	35 (31.5)
Hip fracture	5 (5.0)	0	5 (4.5)
Other fracture	14 (14.0)	1 (9.1)	15 (13.5)
Infection	12 (12.0)	4 (36.4)	16 (14.4)
Syncope	5 (5.0)	0	5 (4.5)
Orthostatic hypotension	3 (3.0)	0	3 (2.7)
Stroke	2 (2.0)	1 (9.1)	3 (2.7)
Metabolic/endocrine/electrolyte disorder	4 (4.0)	1 (9.1)	5 (4.5)
Traumatic brain injury	6 (6.0)	0	6 (5.4)
Other	15 (15.0)	3 (27.3)	18 (16.2)

TABLE 3 (part 2 of 2).
Patients' pre-hospital information

	<i>Transportation Recommended</i>	<i>Transportation Not Recommended</i>	<i>All Patients</i>
	<i>N=100</i>	<i>N=11</i>	<i>N=111</i>
Post ED Destination, n (%)			
Left before seeing physician	1 (1.0)	0	1 (0.9)
Discharge home	42 (42.0)	6 (54.5)	48 (43.2)
Specialty consultation	13 (13.0)	0	13 (11.7)
Inter-hospital transfer	1 (1.0)	1 (9.1)	2 (1.8)
Left against medical advice	0	0	0
Dead at ED	0	0	0
Admission	43 (43.0)	4 (36.4)	47 (42.3)
Post Admission Diagnosis, n (%)^b			
Multifactorial fall	10 (21.7)	0	10 (20.0)
Hip fracture	6 (13.0)	0	6 (12.0)
Other fracture	8 (17.4)	1 (25.0)	9 (18.0)
Infection	8 (17.4)	0	8 (16.0)
Syncope	0	0	0
Orthostatic hypotension	3 (6.5)	0	3 (6.0)
Stroke	3 (6.5)	0	3 (6.0)
Metabolic/endocrine/electrolyte disorder	4 (8.7)	1 (25.0)	5 (10.0)
Traumatic brain injury	1 (2.2)	0	1 (2.0)
Other	3 (6.5)	2 (50.0)	5 (10.0)
Post Admission Discharge Orientation, n (%)^b			
Home	19 (41.3)	0	19 (38.0)
Physical rehabilitation	6 (13.0)	0	6 (12.0)
Post-acute bed	8 (17.4)	1 (25.0)	9 (18.0)
Residence for independent seniors	2 (4.3)	0	2 (4.0)
Residence for dependant seniors	1 (2.2)	0	1 (2.0)
Long-term care centre	6 (13.0)	1 (25.0)	7 (14.0)
Deceased	3 (6.5)	2 (50.0)	5 (10.0)
Repeat ambulance transport within 7 days	5 (5.0)	1 (9.1)	6 (5.4)
Death at 30 days following initial fall	8 (8.0)	2 (18.1)	10 (9.0)

LOS = length of stay; IV = intravenous.

^aA given patient may have more than one item for this question.

^bAmong the 50 patients admitted (4 for the group transport not recommended, and 46 in the group transport recommended, among them 3 patients have been admitted following specialty consultation).

assistance if no injury or illness has occurred.⁽¹⁸⁾ If we had excluded from the 125 assessed patients those who met instability or immobilization criteria, we could have avoided 25 to 30% of transports to the hospital, reducing then the gap between our performance and what was found in the literature.

Four patients required EMS transport within the seven days following initial fall. Of these, three were in the transport recommended group and one in the transport not recommended group. In all four patients, the reason for a repeat visit was a fall, and all had conditions putting them at chronic high risk of falls. No additional new medical condition was discovered upon repeat visit.

Our study had certain limitations, notably the relatively low number of included patients without abnormal findings on assessment, limiting the potential to compare the groups. In addition, several patients had missing data, either from incomplete pre-hospital forms or missing intra-hospital

data. One reason to explain missing data is that once a single anomaly was found on pre-hospital assessment, transport was required, and no further assessment was mandated to avoid slowing intervention time. Another possible bias influencing our results is the period in which data were collected, as the incidence of falls increases during winter months.⁽¹⁹⁻²¹⁾ As such, given that our data were collected in part during winter months, patients were more likely to have a severe fall and have abnormal findings on assessment. Also, as previously stated, community-dwelling older adults are less likely to seek help for a fall unless there is injury or illness. The seasonal variation will be less likely to skew results with a longer period of study, as is intended in the following phases of this study. This was a pilot study: more validation is required, especially considering that for further phases of this study, systematic temperature measurement during pre-hospital assessment, glucose measurement, and ranges to warrant

hospital transport will be added to increase sensitivity for these time-sensitive conditions.

CONCLUSION

This pilot study demonstrates that implementation of an EMT falls-assessment protocol in older adults is feasible and, with some modifications, could potentially identify patients not requiring immediate transport to the ED. It also showed the potential to reduce the number of non-essential transports to the ED in older adults following a fall, instead referring them to community-based falls-prevention services. The results of this study also permitted modifications to increase safety before a larger second phase to evaluate the safety of the protocol. This study presents a novel way of including pre-hospital care in ongoing falls prevention and management efforts in the current care model in the province of Québec, Canada.

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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 that there are no conflicts of interest.

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