The Elder-Friendly Emergency Department Assessment Tool: Development of a Quality Assessment Tool for Emergency Department–Based Geriatric Care

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OBJECTIVES: To develop and conduct a preliminary validation of selected subscales of an elder-friendly emergency department (ED) assessment tool.

DESIGN: Content validation of tool by an international panel. Construct validation using care ratings of ED lead physicians and nurses.

SETTING: Quebec, Canada.

PARTICIPANTS: The international panel comprised 34 clinicians, administrators, and researchers. The construct validation was based on a 2006 survey of ED lead physicians and nurses at all 103 EDs in the province, of whom 68 (66%) supplied complete data.

MEASUREMENTS: The initial tool included five subscales: ED staffing, screening and assessment, discharge planning, community services, and care philosophy. Differences in subscale scores were examined according to ED size, and of these scores were correlated with care ratings made by lead physicians and nurses.

RESULTS: The average scores for three subscales (ED staffing, discharge planning, and community services) varied according to ED size. After adjustment for ED size, three subscales (screening and assessment, discharge planning, and community services) were correlated with ED nurse or physician care ratings. A preliminary tool, taking into account all factors, is proposed.

CONCLUSION: This study provides preliminary evidence of the validity of three subscales of the proposed elder-friendly ED assessment tool. Results suggest that ED size should be considered in interpreting these subscales. Further evaluation and validation of the proposed tool will be needed to further its utility in helping to focus the quality improvement efforts of clinicians, managers, and administrators related to the care they provide older adults. **J Am Geriatr Soc 60:1534–1539, 2012.**

Key words: aged; emergency department; quality of care

The growing number of visits being made by older adults, who present with a greater level of complexity and urgency more often than younger individuals, use more resources and stay longer during a visit in the ED, and are more likely to be admitted to the hospital or to experience higher rates of adverse health outcomes (e.g., return visits after discharge), are increasingly challenging emergency departments (EDs).[1–6] A mounting body of international research has demonstrated that the quality and outcomes of ED-based geriatric care can be improved through ED-based interventions with linkages to community-based services.[7,8] Reviews and consensus panels have recommended a broad spectrum of components of high-quality ED-based geriatric care.[8–15] Although many EDs are developing ways to improve the care they provide for older adults, there are currently no validated tools to help EDs assess the quality of this care.

The goal of the current study was to develop and validate a preliminary version of an elder-friendly ED assessment tool that could be used to assess and plan the

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delivery of ED-based geriatric care and to assist in quality improvement initiatives.[1,9,16] This work builds on proposals for "elder-friendly hospital" care, defined as care that is responsive to the developmental needs of older adults,[17] and for "senior-friendly health services"[18] that are being implemented in Canada and elsewhere. Although criteria for elder-friendly hospital care often include care provided in the ED for elderly adults awaiting hospital admission, criteria for the care of older adults who are discharged to the community (e.g., assessment, discharge planning, and linkage with community services) have generally not been addressed. ED quality improvement teams and accreditation bodies might use such a tool.

The aims of this study were to develop and assess the content validity of several potential subscales for this tool, examine the relationship between subscale scores and ED size, and assess the validity of the subscale scores in relation to lead clinician perceptions of the quality of ED-based geriatric care.

METHODS

This study comprised three steps: development of five tool subscales, computations of subscale scores according to ED size, and validation of the subscale scores. The research ethics committee of St. Mary's Hospital, Montreal, approved the study.

Data Source and Measures

Data collected in a 2006 survey of lead physicians and nurses at all 103 EDs in the province of Quebec, Canada, were used.[19] Different questionnaires were used for the physicians and nurses, who reported on the aspects of staffing and services with which they were more familiar. If available, the person responsible for coordinating geriatric services assisted the lead nurse with answering relevant sections of the questionnaire. Data were used from the 68 EDs (66%) that supplied complete physician and nurse data. These EDs were similar to the 35 EDs with incomplete data with respect to their size and the characteristics of their older users.[19]

A multidisciplinary team comprising a geriatrician with substantial ED experience (JV), an ED physician (AV), a nurse experienced in ED care, and two ED researchers (JM) developed the content of the questionnaire. The content was based on published reports of aspects of ED care that might contribute to the safety of discharge to the community and included questions on ED staffing, screening, assessment, discharge planning, and links to community services.[7,8,10–12] The perceptions of participants of the responsibility of the ED for three aspects of geriatric care were assessed using three items with 4-point Likert response scales (strongly agree to strongly disagree): screen elderly adults at risk; assess the social, psychological, and medical needs of elderly adults; and ensure follow-up of services prescribed for elderly adults during an ED visit. These items were dichotomized (agree versus disagree) to develop the care philosophy subscale. (See Step 1, below.)

The lead physician and nurse at each ED independently rated the quality of geriatric care in their ED by answering three questions on the care of elderly adults discharged to the community: "Does the ED meet the needs [of elderly adults]? Has the ED developed collaborations with other departments within the hospital? Has the ED developed collaborations with services in the community?" A 5-point response scale was used, from 1 (not at all) to 5 (completely). The Cronbach alpha coefficients[20] for the care ratings were 0.80 for the nurse and 0.76 for the physician. The correlation between the nurse and physician care ratings was low (correlation coefficient = 0.12), indicating poor agreement on the quality of ED-based geriatric care. Separate care ratings were therefore computed for the nurses and physicians, defining a positive care rating as an average score of 4 or more. These care ratings were used as the outcome measures in the validation. (See Step 3, below.)

ED size was a composite variable with three categories (large, medium, small) based on number of ED beds, university affiliation, level of care, and rural versus urban location.[19]

Step 1: Development of Five Subscales

Five subscales were constructed that grouped items from the 2006 ED survey into the following domains: (A) ED staffing, (B) screening and assessment, (C) discharge planning, (D) community services, and (E) care philosophy (Table 1). An international panel of 34 clinicians, administrators, and researchers rated the appropriateness of these five subscales and items and two other potential subscales that were not measured in the 2006 survey: evaluation and monitoring and ED physical environment.

Step 2: Computations of Subscale Scores According to ED Size

The revised subscales were evaluated using data from the 2006 ED survey. Subscale scores were computed and then compared according to ED size. Linear regression models were used to study the effect (trend) of ED size on each subscale score,[21] with ED size considered as an ordinal predictor (1 [smaller] to 3 [larger]); all linear models were compared with the corresponding analysis of variance model to check for linearity.

Step 3: Validation of Subscale Scores

The construct validity of the tool was evaluated by testing the hypothesis that subscale scores would be associated with the care ratings that important informants made. Logistic regression models[22] were constructed for each of the five subscale scores as predictors and nurse and physician ratings as binary outcomes (total of 10 models). Odds ratios and 95% confidence intervals were computed for each model, adjusting for ED size. A quadratic term was added to test for nonlinearity for each ordinal subscale variable. Partial least square regression was used to explore whether individual items might be more important predictors of the care ratings;[23] a variance important in the projection of more than 1 was used as a measure of item importance.[23] This analysis allowed the most important items that one ED clinical leader reported to be

Table 1. Elder-Friendly Emergency Department (ED) Tool Subscales and Items: Endorsement by International Panel (n = 34) and Frequencies in 68 Quebec EDs According to Size[a]

Subscales and Items and Source[b]	Endorsement, (n = 34) %	ED Size		
		Large (n = 18)	Medium (n = 22)	Small (n = 28)
A. ED Staffing (eight points)	94			
A.1. Specialized nurses are available for assessment of seniors	85			
A.1.a. Liaison nurse, % (N)		100	96	54
A.1.b. Geriatric nurse clinician, % (N)		50	32	14
A.2. A social worker is available, % (N)	88	100	86	96
A.3. A pharmacist is available, % (N)	74	100	68	86
A.4. A physiotherapist is available, % (N)	59	61	64	64
A.5. An occupational therapist is available, % (N)	53	39	59	54
A.6. Geriatric consultation is available, % (P)	79	61	23	21
A.7. Designated professional coordinates geriatric services, % (N)	91	67	23	11
Total: mean ± SD		5.8 ± 1.1	4.5 ± 1.8	4.0 ± 1.3
Trend test[c], $P < .001$				
B. Screening and assessment (seven points)	91			
B.1. High-risk screening, % (N)	85	61	55	36
B.2. Standardized cognitive status assessment tool(s), % (N)	77	28	14	14
B.3. Standardized functional status assessment tool(s), % (N)	85	22	14	14
B.4. Medication assessment performed, % (N)	85	11	9	11
B.5. Protocol for delirium management, % (P)	85	0	5	7
B.6. Protocol for restraints, % (P)	79	61	59	54
B.7. Protocol for hip fracture or falls, % (P)	71	50	18	11
Total: mean ± SD		2.3 ± 1.5	1.7 ± 1.3	1.5 ± 1.6
Trend test[c], $P = .062$				
C. Discharge planning (seven points)	94			
C.1. Discharge planning protocol for seniors, % (N)	79	17	23	7
C.2. Professional trained in discharge planning, % (N)	85	78	68	61
C.3. Medication reconciliation of prescriptions at discharge conducted by pharmacist or physician (P) or standardized medication assessment tool(s) used, % (N)	77	72	27	14
C.4. Clinical information usually transferred to primary physician, % (P)	79	11	9	18
C.5. Mechanism to transfer information to home care services (P) or agreement with home care services to transfer information, % (N)	79	72	73	68
C.6. Written information provided at discharge, % (N)	77	56	50	43
C.7. Postdischarge telephone follow-up may be performed, % (N)	56	6	0	4
Total: mean ± SD		3.1 ± 1.3	2.5 ± 1.7	2.1 ± 1.4
Trend test[c], *P*-value = .034				
D. Community services (six points)	82			
D.1. Clinical information accessible from home care services, % (N)	91	56	59	82
D.2. Rapid evaluations by home care services accessible, % (N)	94	17	59	57
D.3. Outpatient geriatric clinic available, % (P)	94	17	5	11
D.4. Day hospital available, % (N)	82	17	32	32
D.5. Rehabilitation services available, % (P)	88	61	50	68
D.6. Clinical information on patients accessible from community physicians, % (P)	—[d]	6	23	29
Total: mean ± SD		1.7 ± 1.0	2.3 ± 1.5	2.8 ± 1.3
Trend test[c], $P = .008$				
E. Care philosophy (six points)[e]	71			
Nurse				
E.1. Screening of seniors at risk, % (N)	82	94	96	89
E.2. Assessment of psychosocial and medical needs of seniors, % (N)	85	67	68	64
E.3. Postdischarge follow-up, % (N)	53	61	23	29
Physician				
E.4. Screening of seniors at risk, % (P)		89	100	75
E.5. Assessment of psychosocial and medical needs of seniors, % (P)		50	55	43
E.6. Postdischarge follow-up, % (P)		11	36	32
Total: mean ± SD		3.7 ± 1.4	3.8 ± 1.4	3.3 ± 1.4
Trend test[c], $P = .31$				
ED characteristic,%				
Urban location		100	100	35
≥ 21 beds		83	14	0
University affiliation		78	55	11
Tertiary or specialized level of care		67	5	0

[a] ED size is a composite measure based on location, number of beds, university affiliation, and level of care.

[b] Source is shown in parentheses for each item: P = physician, N = nurse.

[c] Trend test: performed with a linear regression model.

[d] Not included in panel survey.

[e] The nurse and physician completed the three items independently.

SD = standard deviation.

validated against the independent care ratings of the other leader. All calculations were carried out in SAS 9.2 (PROC CORR, PROC REG, PROC LOGISTIC, and PROC PLS; SAS Institute, Inc., Cary, NC).

RESULTS

The subscales and items that the panel assessed and those that were measurable in the 2006 survey are shown in Table 1. The first column shows the endorsement rates by the international panel. The responses to the survey are shown in Table 1. The majority of respondents rated all the subscales and items as appropriate; more than 90% endorsed ED staffing, screening and assessment, and discharge planning; more than 80% endorsed community services; and more than 70% endorsed care philosophy. Certain items were endorsed less frequently (e.g., presence of a physiotherapist or occupational therapist in subscale A and items on postdischarge follow-up [C.7 and E.3]); 94% and 88% of panel members endorsed the two additional potential subscales, evaluation and monitoring and ED physical environment, respectively.

For items measured in the 2006 survey, a score for each subscale was obtained by adding a positive answer to each item, for a maximum score varying from 6 to 8. Larger EDs scored significantly higher on ED staffing and discharge planning, whereas smaller EDs scored higher on community services. Scores on screening and assessment and care philosophy did not differ significantly according to ED size.

Results of the regression analyses showing the relationships between the five subscales and the two outcome measures—nurse and physician care ratings—are shown in Table 2. The discharge planning and community services subscales were significantly associated with the nurse care ratings, whereas the screening and assessment and community services subscales were significantly associated with the physician care ratings. The partial least square regression indicated that nine items had substantial (variance important in the projection > 1) positive associations with one or both outcomes: availability of a social worker (A2); availability of a physiotherapist (A4); availability of geriatric consultation (A6); standardized functional status assessment (B3); medication assessment (B4); a discharge planning protocol (C1); written information provided at discharge (C6); rapid evaluations by home care services (D2); and physician rating of the responsibility of the ED to assess the social, psychological, and medical needs of elderly adults (E5). Seven of the nine items were validated against independent care ratings. For example, availability of a social worker, reported by nurses, was associated with overall better quality of care rated by doctors. Only items C6 and E5 were not validated against independent care ratings.

Table 2. Associations Between Subscale Scores and Positive Care Ratings[a] from Lead Emergency Department (ED) Nurses and Physicians (n = 68 EDs)

	Multivariate[b] OR (95% Confidence Interval)	
Subscale	Nurse Rating	Physician Rating
A. ED staffing (eight points)	1.03 (0.72–1.48)	1.12 (0.78–1.61)
B. Screening and assessment (seven points)	1.14 (0.81–1.62)	1.67 (1.12–2.47)
C. Discharge planning (seven points)	1.73 (1.13–2.65)	1.13 (0.79–1.62)
D. Community services (six points)	1.79 (1.13–2.84)	1.67 (1.07–2.62)
E. Care philosophy (six points)	0.80 (0.55–1.16)	1.33 (0.89–1.98)

[a] Positive care rating is average score of 4 or more on three questions with a 5-point response scale (see text).

[b] Adjusted for ED size. The odds ratios (ORs) are for a 1-point increase in the subscale score.

DISCUSSION

Preliminary validation studies were developed and conducted on five subscales of an elder-friendly ED assessment tool to assess ED-based geriatric service provisions for elderly adults discharged from the ED to the community: ED staffing, screening and assessment, discharge planning, community services, and care philosophy. These subscale items measure important characteristics of effective ED-based geriatric services.[8] The scores obtained on each subscale allow differentiation of EDs regarding different aspects of their geriatric service provision. Larger EDs had higher scores on ED staffing (indicating a greater variety of multidisciplinary staff available to the ED), whereas smaller EDs had higher scores on community services. These results underline the need to interpret the scores relative to other EDs of similar size.

After adjustment for ED size, higher scores on three of the subscales (screening and assessment, discharge planning, and community services) were correlated with better quality of geriatric ED care as perceived by ED physician and nursing leaders, providing preliminary evidence of their validity. These three subscales address different aspects of effective ED-based geriatric care processes that were identified in a previous systematic review.[8] The majority of large, mostly university-affiliated EDs have a designated professional to coordinate geriatric services, conduct high-risk screening, and have some form of medication assessment before discharge. Only a minority of these large EDs offer standardized cognitive or functional testing, protocols for the management of delirium, or discharge planning protocols. Although linking with community providers is a critical role for the ED in helping to ensure the integrity of care plans initiated in the ED—particularly for high-risk elderly adults[8]—communication with community physicians was infrequent, and postdischarge telephone follow-up was rare.

The subscale assessing community services focuses primarily on the availability of these services needed to support the safe discharge of older adults.[7] Although EDs are not directly responsible for provision of these community services, they have a responsibility to develop linkages with those services in their community to ensure that information exchange and the provision of services after discharge occurs. Community-based multidisciplinary care programs can reduce ED use.[24] Unless these services are in place and accessible, improved ED-based programs will

not achieve their full potential.[7,25] Medium-sized and small EDs tended to perform better on this subscale, perhaps because they have to interact with fewer community providers, making it easier for them to establish collaborative links.

Two subscales were not validated in this study. The expert panel rated the ED staffing subscale highly, but it was not correlated overall with physician or nurse care ratings, although presence of a social worker and availability of geriatric consultation were correlated with care ratings and, in a previous study, were associated with fewer return ED visits by elderly adults.[26] Further evaluation of this subscale is needed. ED leaders may perceive the process of ED-based geriatric care to be more important than structural aspects such as staffing. The Care Philosophy subscale was rated as less important by our international panel than the other subscales, and was not correlated with ED leader care ratings. Nevertheless, an elder-friendly ED culture may be an important facilitator of effective ED-based geriatric care;[27] it may also be useful for ED teams to assess to what degree all team members share a common care philosophy when developing ED-based geriatric care initiatives. Further work on this subscale may be warranted.

Several limitations of this study should be considered. First, this work is based on a 2006 survey and incorporates important components of ED-based geriatric care that had been published at that time. Second, although the survey questions were pretested, their reliability was not formally tested. Services reported as available may not be used optimally or appropriately. Third, the opinions of the panel who rated the content validity of the tool may not have been representative. Fourth, the subscale scores were validated against ED leaders' assessments of the quality of care measured in the same survey. However, the eight items that had substantial associations with these ratings were independently associated with the care rating by an individual who did not report on the presence of the item. Care ratings of physician and nurse leaders were poorly correlated in this study. The reasons for this should be investigated. Fifth, this work has focused on the quality of care of elderly adults who are discharged to the community. Additional measures may need to address the care of elderly adults who are admitted to the hospital or transferred to other institutional settings.

Despite these limitations, this study provides preliminary evidence of validity for three aspects of ED-based geriatric care processes (screening and assessment, discharge

Table 3. A Proposed Elder-Friendly Emergency Department (ED) Assessment Tool

Education of ED staff in elder-friendly ED care
Educational initiatives exist for nursing and allied health professionals
Educational initiatives exist for ED physicians
Elder-Friendly physical environment and design principles
Prepared environment (e.g., clutter-free environment, noise-reduction methods, appropriate lighting and signage)
Adaptive furniture that promotes function and safety (e.g., low stretchers, thick mattresses, upright and reclining chairs)
Access to adaptive equipment (e.g., walkers, canes, hearing amplifiers)
Presence of staff with geriatrics expertise
Designated clinical coordinator or team leader for ED-based geriatric care—on site
Advanced practice nurse or nurse clinician providing geriatrics assessment and management support—on site
Social worker—on site
Physiotherapist or occupational therapist—available
Pharmacist—available
Geriatrics consultation service—available
Presence of geriatric screening and assessment protocols for vulnerable elderly adults using validated tools
High-risk screening tools to identify vulnerable elderly adults
Cognitive, functional, and mobility assessments
Medication review and reconciliation
Standardized protocols for identification, prevention, and management of delirium, falls, functional decline, dehydration, incontinence, and pain
Discharge planning of vulnerable elderly adults from ED to community
Nurse or nurse clinician for supportive discharge planning
Medication reconciliation at discharge
Transfer of clinical information to primary care physician
Transfer of clinical information to home care services
Key information given in writing/explained to older patients and caregivers at discharge
Linkages between ED and relevant community care and services to ensure service delivery occurs after discharge to community and appropriate information exchange occurs
Primary care physicians
Home care services
Rehabilitation and convalescence services
Geriatric outpatient clinic or day hospital services
Evaluation and monitoring of ED-based geriatric care processes
Hospital admission rate
ED and hospital lengths of stay
ED repeat visits and subsequent hospital admission rate
Patient, caregiver, and provider satisfaction with service

planning, and linkages to community services). Further development of the tool will require the incorporation of components prioritized in this project, as well as in other published consensus reports and reviews (e.g., education of ED staff, quality improvement and monitoring, and adaptation of the physical environment).[8,10–15,17]

A proposed tool that synthesizes what was learned in this study with research evidence and best practices reported in the literature is shown in Table 3: the Elder-Friendly ED Assessment Tool. This tool is designed to be used as a checklist for quality assurance and service development in relation to geriatric care in the ED. The tool will require research on its reliability (e.g., agreement between multiple raters) and validity (e.g., further assessment by ED staff of the relevance and importance of the proposed items and tool) and studies on the relationship between tool scores and relevant outcomes, including unplanned return ED visits, and patient and family member perceptions of problems experienced.[28] The tool also will need to be adapted for use in different contexts because of interregional, interprovincial, and international differences in the function and organization of ED services and in the availability of resources within a given hospital, ED, and community. The Elder-Friendly ED Assessment Tool is a first attempt to provide a method for clinicians, managers, and administrators to focus their quality improvements efforts related to the care they provide to older adults.

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Author Contributions: JM designed and led the study, obtained funding, and drafted the manuscript. JV helped to develop the original questionnaires and designed the subscales. DL, DR, and AV helped to obtain funding and assisted with the design of the questionnaires. JV, DL, DR, AV, JFL, and SS helped to revise the manuscript. KYK designed and administered the expert survey. EB conducted the statistical analysis. All authors approved the final manuscript for submission.

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