

Standardized Screening and Assessment of Older Emergency Department Patients: A Survey of Implementation in Quebec*

Jane McCusker,^{1,2} Josée Verdon,^{3,4} Nathalie Veillette,⁵ Katherine Berg,⁶ Tina Emond,¹ and Eric Belzile¹

RÉSUMÉ

Des méthodes efficaces ont été développées pour aider le personnel des départements d'urgence (DU) à s'ajuster au nombre croissant de patients âgés, leur procurant des outils de dépistage et d'évaluation permettant d'identifier les patients plus à risque ainsi que les besoins spécifiques à ceux-ci. Ce sondage des informateurs-clé de tous les départements d'urgence ($n=111$) de la province de Québec porte sur l'implantation de ces outils ainsi que sur les barrières à leur implantation. Les questionnaires (complétés soit par téléphone ou auto-administrés) incluaient : les caractéristiques du département d'urgence (DU), les caractéristiques des répondants, l'utilisation d'outils ainsi que le mode d'implantation. Les barrières à l'implantation de ces outils sont : le manque de ressources pour dépister et faire le suivi, la méconnaissance de la différence entre outils de dépistage et d'évaluation et enfin, la nécessité d'adapter les outils aux contextes locaux. La formation des intervenants et des essais préalables sont nécessaires à l'implantation fructueuse.

ABSTRACT

Cost-effective methods have been developed to help busy emergency department (ED) staff cope with the growing number of older patients, including quick screening and assessment tools to identify those at high risk and note their specific needs. This survey, from a sample of key informants from all EDs ($n=111$) in the province of Quebec (participation rate of 88.2%), investigated the implementation of these tools and barriers to implementation. Questionnaires (administered either by telephone or by self-completion) included characteristics of the ED, characteristics of the respondent, use of tools, and method of implementation. Barriers to the implementation of these tools included lack of resources for screening and follow-up, misunderstandings of the difference between screening and assessment tools, and need for adaptation of the tools to the local context. Education of staff and pre-implementation adaptation and testing are needed for successful implementation.

1 Department of Clinical Epidemiology and Community Studies, St. Mary's Hospital Centre

2 Department of Epidemiology, Biostatistics, and Occupational Health, McGill University

3 McGill University Health Centre, Royal Victoria Hospital

4 Division of Geriatrics, McGill University

5 Institut universitaire de gériatrie de Montréal, Université de Montréal

6 Department of Physical Therapy, University of Toronto

* The authors are grateful to Dr. Alain Vadeboncoeur and Sylvie Berger of the Quebec Ministry of Health and Social Services, for making the working documents on the ED classification available to us. We also appreciate the assistance provided by Karine St-Denis in the data collection. This study was funded by a grant from the Inter-University Group on Emergency Research (Groupe interuniversitaire de recherche sur les urgences—GIRU).

Manuscript received: / manuscrit reçu : 13/06/05

Manuscript accepted: / manuscrit accepté : 05/12/06

Mots clés : vieillissement, dépistage, service des urgences, mise en oeuvre, sondage

Keywords: aging, screening, emergency department, implementation, survey

Requests for offprints should be sent to: / Les demandes de tirés-à-part doivent être adressées à :

Jane McCusker, M.D., Dr.P.H., St. Mary's Hospital Centre, Department of Clinical Epidemiology and Community Studies
3830 Lacombe Avenue Montreal, QC H3T 1M5 (jane.mccusker@mcgill.ca)

Introduction

Older adults use hospital emergency departments (EDs) at higher rates than do younger adults,¹ are more likely to make a return visit,² stay longer in the ED and use more resources,³ and subsequently experience high rates of functional decline⁴ and of health services utilization.^{5,6} The aging of the population has therefore contributed substantially to increased use and crowding of EDs in many countries.⁷ Deficiencies in the quality of services provided to older ED patients include failures to recognize problems that could benefit from more careful assessment (either in the ED or in another setting), to refer patients to appropriate community services, and to communicate information from the ED visit to the primary physician.^{5,8–11} Thus, interventions directed at older ED patients that help to identify those at high risk and to optimize post-hospital care are of great importance.

High-risk geriatric screening has been conducted in various settings (including general practice and community settings^{12–15} and at hospital admission¹⁶), but not, until recently, in the ED. Two screening tools were recently developed and validated for screening older adults in the ED. The Identification of Seniors at Risk (ISAR) questionnaire (Table 1), developed in Quebec, is a six-item self-report screening test, validated by its ability to predict functional decline and health services utilization.^{6,17–19} The Triage Risk Screening Test (TRST), similar to the ISAR tool, developed shortly afterwards in the United States, was validated by its ability to predict health services utilization.²⁰

Screening has been used as the first step in an ED-based case-finding approach. High-risk patients identified by screening receive a clinical assessment and referral intervention, usually from a nurse.

In 2001, the results were reported of a randomized trial, conducted in four Montreal hospitals, of a two-step intervention for patients aged 65 and over who were to be discharged from the ED.²¹ High-risk patients (score of 2 or more out of 6) were referred to a nurse, who performed a brief, standardized evaluation of unmet needs (step 2) and prepared a discharge plan to optimize the use of community services. The two-step intervention (ISAR-2) significantly reduced the rate of functional decline apparent 4 months after the ED visit and was cost-effective.^{21,22} A trial in the United States tested a similar intervention in both high-risk and low-risk patients, based on the TRST tool.²³ The intervention, which reduced nursing home admissions and increased satisfaction with care, appeared to be more effective among high-risk patients. Clinical trials in Australia and the United Kingdom of one-step interventions (without screening as the first step and limited to age 75 and over) also had beneficial effects on subsequent physical and cognitive function.²⁴

As a whole, this body of research provides evidence for the effectiveness of targeted case-finding interventions with older ED patients, using standardized screening and assessment tools. We were interested in the extent to which these tools were being used in Quebec EDs, in particular those tools used in the ISAR-2 intervention, which had been locally developed in French and English, evaluated, and disseminated. In addition to publication in the scientific literature,^{21,22,25} methods of dissemination included presentations at local, national, and international conferences; distribution of a printed summary of the main results to Quebec hospitals and local community health and social service centres (CLSCs); and posting of electronic versions of the ISAR tool and the results of the trial on the project Web page.

Table 1: Identification of Seniors at Risk (ISAR) questionnaire

Before the illness or injury that brought you to the emergency department, did you need someone to help you on a regular basis? (yes = 1, no = 0)

Since the illness or injury that brought you to the emergency department, have you needed more help than usual to take care of yourself? (yes = 1, no = 0)

Have you been hospitalized for one or more nights during the past 6 months (excluding a stay in the emergency department)? (yes = 1, no = 0)

In general, do you see well? (yes = 0, no = 1)

In general, do you have serious problems with your memory? (yes = 1, no = 0)

Do you take more than three different medications every day? (yes = 1, no = 0)

The score is the sum of the individual question scores (range = 0–6).

Although there has been some prior research on implementation of screening tools (e.g., cancer screening tests, depression screening),²⁶ no one, to our knowledge, has investigated geriatric screening in the ED. We therefore undertook this study of the implementation of standardized screening and assessment tools for older ED patients. Specific objectives were (a) to identify contextual factors associated with use of ISAR and other tools, including type and size of ED, university affiliation, and availability of staff to assess older patients; (b) among users, to describe methods of use (when, by who, what follow-up); and (c) to identify potential barriers to and facilitators of implementation. We planned to use the results to recommend changes in the intervention tools and/or instructions and to provide guidelines for implementation for potential users.

Methods

The primary study sample comprised the 111 general adult EDs in Quebec (29 in acute-care hospitals and 32 in non-hospital settings (excluding EDs in two children's hospitals and two psychiatric institutions). All facilities are public, not-for-profit; a list was provided by the Quebec Ministry of Health and Social Services (MSSS). Six of the Montreal hospitals had participated in the original research to develop the ISAR tool and/or the ISAR-2 trial.^{17,21} A research assistant attempted to contact the head of geriatric medicine or, if the hospital had no geriatric service, the ED head nurse. Initial contacts were by telephone and/or mail and respondents were invited to complete the questionnaire over the telephone or by mail. Non-responders were followed up several times in an effort to increase the response rate. The study protocol was approved by the St. Mary's Hospital Research Ethics Committee.

Survey Questionnaire

The survey questionnaire was developed by the authors, three of whom are health professionals with substantial experience in the multidisciplinary assessment of older adults in the ED (JV, NV, KB). The questionnaire contained open- and close-ended questions, grouped into sections on implementation of tools and characteristics of the ED and of the respondent (see below). The questionnaire was not formally evaluated for validity and reliability. However, the study coordinator first pilot-tested the questionnaire with five physicians and nurses who had been involved with our group in previous studies of ED care of older patients. Following the pilot-testing, small revisions were made to clarify the questions. The first author and the study coordinator

(TE) subsequently reviewed all completed questionnaires to clarify incomplete, inconsistent, or unclear responses; if necessary, the respondent was re-contacted.

1. *Implementation*: EDs were classified, using a close-ended question, into one of three categories with respect to implementation of the ISAR tool: (a) *had not considered using*, (b) *had considered using but not used* (including those who had decided not to use and those currently considering use) and (c) *users* (currently and previous). Respondents were also asked whether they were using other screening or assessment tools. Current and previous users of ISAR and current users of other tools were asked questions about the characteristics of patients targeted (age, stretcher or ambulatory, patients admitted or discharged), and method of administration (when, by whom, during which days and shifts). Additional, open-ended questions, asked if applicable, included: reasons for various implementation decisions, modifications made to ISAR, and the method of clinical follow-up after administration of the screening or assessment tool.
2. *Emergency department characteristics*: Characteristics of the ED included daily number of visits of patients aged 65 and over (<10, 10–49, 50+) and availability of ED staff specialized in the care of older people (*liaison nurse, social worker, geriatric consultation, psychogeriatric consultation, other*).
3. *Characteristics of respondent*: Respondents were asked for their professional background (*profession, level of involvement in care of the elderly, and level of involvement in the ED*).

Other data

One hundred of the 111 Quebec EDs were classified—based on an unofficial working document that considered the resources available (e.g., diagnostic, specialist care)—into four categories: tertiary, secondary, and primary acute-care hospital EDs, and stabilization centres located in health centres outside hospitals. The 11 unclassified EDs were categorized in a fifth category: other health centres (not in acute care hospitals). The number of ED stretchers was obtained from the MSSS. Presence of an acute geriatric unit was obtained from a recent survey.²⁷ Rural versus urban location of the ED was determined from the postal code.

Results

Among the 111 Quebec EDs in the sample, questionnaires were completed by key informants for 98 (88.2%). Considering those variables defined from other data (see “Methods”), significantly

lower participation was found in tertiary-level EDs (Table 2). Respondents included nurses (88.7%, usually the ED head nurse) and physicians (7.2%), and the remainder were other health professionals (data not shown).

Use of ISAR Tool

The ISAR screening tool had been implemented in 13 (13.3%) EDs; seven were currently using it, and six had discontinued. A further 12 EDs (12.2%) had considered using ISAR but were not doing so at the time of the survey. There was no apparent link among the 13 current or prior users (e.g., location, network). Notably, although two of the six Montreal hospitals that were involved in either the validation of the ISAR

tool or the ISAR-2 intervention had used ISAR in the past, none were currently using either ISAR or any other standardized tool.

ISAR implementation was significantly related to four inter-related ED characteristics: level of ED, university affiliation, number of stretchers, and number of visits by patients age 65 and over. We created a composite variable with four categories based on level of ED and university affiliation: *tertiary level* (all were university-affiliated); *primary or secondary EDs with university affiliation*; *primary or secondary EDs without university affiliation*; and *other EDs* (only 3 of 30 were university-affiliated). This composite variable was significantly associated with ISAR implementation (Table 3). We did not consider these factors further because number of visits by patients age 65 and over were highly correlated with this composite variable.

There was also a significant relationship between the availability of any geriatric staff and the decision to use ISAR. However, the sample size precluded further analysis to determine whether this effect was independent of the effect of type of ED.

We conducted sensitivity analyses under the assumption that none of the non-responding EDs were using ISAR because the participation rate was lower among the tertiary EDs. These calculations yield the following estimates of use (current or prior)–tertiary: $5/18=28$ per cent; secondary: $3/37=8$ per cent; primary: $3/24=13$ per cent; stabilization: $2/17=12$ per cent; other health centre: $0/15=0$ per cent ($p=0.17$, Fisher's Exact test).

ISAR users (current and prior) reported some advantages (speed, simplicity, validation in ED setting, clinical relevance) and some disadvantages (false negatives, false positives) of this tool. Recommendations made on improving the tool included simplify wording, combine first two questions, increase number and detail of questions (e.g., add question on falls), include the follow-up evaluation and referrals to community services, look at test performance without items 4 and 6, allow room for judgement. Some users had made modifications corresponding to some of these recommendations.

Among Quebec EDs that had not considered using the ISAR tool or that had considered but decided against use, the main reasons were lack of resources (staff, funding, what to do with those who screened positive), characteristics of the screening tool (too broad, vague, subjective), and resistance to change (another form to fill out, attitudes towards elderly). Some of the reasons given reflected a lack of understanding of the purpose of the ISAR screening tool (e.g., the tool is not comprehensive enough).

Table 2: Participation rate of Quebec emergency departments (EDs) by characteristics of ED (N = 111)

Characteristic ^a	Total	Participants		p-value ^b
	N	n	(%)	
Level of ED				0.03
Tertiary	18	12	(67)	
Secondary	37	33	(89)	
Primary	24	23	(96)	
Stabilization centre	17	15	(88)	
Other health centre	15	15	(100)	
Location				0.21
Urban	63	54	(86)	
Rural	45	42	(93)	
(missing)	(3)	(2)		
Number of Stretchers				0.24
0–7	22	20	(91)	
8–18	38	31	(82)	
19+	20	17	(85)	
Data not available	31	30	(97)	
Geriatric Service				0.30
Yes	62	52	(84)	
No	24	23	(96)	
Data not available	25	23	(92)	
University Affiliation				0.21
Yes	39	32	(82)	
No	72	66	(92)	
Total	111	98	(88)	

^a Source: Quebec Ministry of Health.

^b χ^2 or Fisher's Exact test.

Among six Quebec EDs that had stopped using the ISAR screening tool, three did so because follow-up resources were no longer available, two because they were required to begin using another tool (PRISMA-7, see below), and one because of problems with the method of administration (patients were unable to complete it on their own).

Use of Other Tools

The use of other tools was reported in 22 (22.4%) of Quebec EDs; none of these was currently using the ISAR screening tool but three had previously used it. Use of other tools was not associated with the type of ED, but was significantly more frequent in EDs with specialized geriatric staff. Specific tools included the PRISMA-7 (developed for the PRISMA integrated service-delivery system in one region of the province),²⁸ tools required for referral to CLSC-based case-management services, and tools developed by

ED staff for their own use. Seven of these locally developed tools were provided. Six of these were labelled “screening” tools, although the length of the tools varied between 7 and 24 items. In general, the domains covered by these tools were similar to those in the ISAR-2 step-2 assessment; in some case items had been adapted from other assessment tools.

Method of Implementation

Table 4 shows the method of implementation reported by users of ISAR (current and previous) and of other tools (current only). The majority of users limited use of the tool to assessing older patients (at least age 70) soon after their arrival in the ED. The ISAR tool was usually administered by the triage nurse, whereas other tools were often administered by a liaison nurse or social worker. Follow-up of positive ISAR results was usually in hospital in-patient units or in the

Table 3: Characteristics of Quebec emergency departments related to use of ISAR and other tools (n = 98)

Characteristic	Total N	ISAR			Other Tools	
		Considered (%)	Use ^a (%)	p-value*	Use ^b (%)	p-value ^c
Total	98	12.2	13.3		22.4	
Type of ED				0.01		0.37
3°/ University-affiliated	12	25.0	41.7		25.0	
1° or 2°/ University-affiliated	17	17.6	17.6		17.6	
1° or 2°/ Not university affiliated	39	7.7	7.7		30.8	
Non-hospital ED ^d	30	10.0	6.7		13.3	
Location				0.10		0.08
Urban	54	16.7	16.7		29.6	
Rural	42	7.1	7.1		14.3	
(missing)	(2)					
Staff Specialized in ED						
Nurse	38	18.4	15.8	0.18	23.7	0.92
Social worker	21	9.5	19.1	0.71	52.4	<0.01
Geriatric consultant	26	19.2	23.1	0.06	38.5	0.03
Psychogeriatric consultant	6	0.0	16.7	1.00	50.0	0.13
Other	5	0.0	0.0	1.00	40.0	0.33
Any of the above	56	16.1	19.6	0.02	32.1	0.01
None of the above	39	5.1	5.1		10.3	
(missing)	(3)					

a Current or prior use.

b Current use only.

c χ^2 or Fisher's Exact test.

d Three were university-affiliated.

Table 4: Type of implementation of ISAR and other tools

Characteristic	ISAR ^a (n = 13) ^a		Other Tools (n = 22)	
	n	%	n	%
Administered by				
Triage nurse	9	69	10	46
ED nurse	2	15	3	14
Liaison nurse	1	8	5	23
Social worker	1	8	4	18
Age Group				
85+	0	0	1	5
75+	7	54	8	36
70+	3	23	2	9
65+	3	23	10	45
Not specified	0	0	1	5
When Administered				
Soon after arrival	10	77	19	86
Other	3	23	3	14
Follow-up (more than one)				
Assessment in ED	5	38	14	64
Assessment on ward	6	46	3	14
External assessment ^b	12	92	20	91

a Includes seven current and six prior users.

b CLSC, home care, day centre, other community agency.

community. None of the users had adopted the step-2 standardized nursing assessment.

Discussion

In this study, we investigated the use of screening and assessment tools for older ED patients, including the recently developed and validated ISAR tool,²⁹ in a sample of Quebec EDs. The results show, first, that the decision to use a standardized tool is related to the availability of geriatric staff in the ED. The decision to deploy these staff to the ED reflects the older ED population's perceived importance in the eyes of the institution; these staff play an important role in determining the services to be provided to older patients. Second, the use of ISAR (but not other tools) is related to the complexity of ED care and university affiliation. This effect may be due to the validation studies of the ISAR that were published and disseminated in other ways. In larger, more academically oriented EDs, the staff may attend more professional conferences and be more familiar with the medical literature. Thus, the intervention may be more

compatible with the beliefs and practices of these staff.³⁰

Although there has been little prior relevant research, the rate of implementation of the standardized screening and assessments tools in this study was consistent with the range of rates of implementation of other types of screening tests in primary care settings.²⁶ Three main barriers to implementation were identified in this survey: availability of resources, confusion about the goals of screening *versus* assessment tools, and lack of an adaptation process.

1. *Availability of resources:* Most respondents focused on the resources needed to conduct screening; a few also mentioned the resources required to follow-up on positives. Greater use in tertiary-level EDs may reflect the greater availability of resources to conduct follow-up. However, even many EDs with specialized staff were not using ISAR. The real issue may not be what resources are available but how those resources are deployed. The advantage of a systematic approach using a screening tool is that it enables the direction of

these resources to those at greatest risk, who might otherwise slip through the cracks. This is particularly important in the busy environment in many EDs. While administration of the ISAR screening tool requires a few additional questions, these can easily be incorporated into the triage process. EDs that wish to reduce further the resources required may choose to limit which patients are screened (e.g., to age 75 and over) and/or to set the cut-point for a positive screen at three or more instead of two or more positive responses. The implications of these decisions are illustrated in the original study of the ISAR screening tool.¹⁷

2. *Screening versus assessment tools:* Screening in a clinical context such as the ED is the first step of a *case-finding program* ("secondary prevention through early detection of cases among persons using health services for other reasons, e.g., checking blood pressures of patients who attend a physician's office"³¹). The purpose of screening is the "presumptive identification of unrecognized disease or defect by the application of tests, examinations, or other procedures which can be applied rapidly".³¹ Screening tests are not intended to be definitive, diagnostic, or comprehensive. A useful ED-based high risk screening tool for older ED patients is characterized by its brevity, simplicity, and ability to categorize individuals into two groups: those that may be at increased risk of adverse outcomes (who require a clinical assessment) *versus* those that are not. Because definitive and/or comprehensive clinical assessment may not be feasible during an ED visit, the goal of the clinical assessment should be to determine the type and location of follow-up required by the patient (e.g., pain control in the ED, hospital admission to investigate delirium, referral to the primary physician to evaluate causes of unsteadiness, referral for new or different home care services). The distinction between screening and assessment tools did not appear to be understood well by most survey respondents. Some respondents rejected the ISAR screening tool because it was not comprehensive (did not contain questions on all areas thought to be important in the assessment of older patients). These individuals apparently wanted a one-step assessment tool. Interestingly, none of the users of the ISAR screening tool appeared to be using step-2 (standardized clinical assessment) or a comparable standardized assessment tool.
3. *Adaptation process:* Some EDs decided not to use ISAR because of the wording of some of the questions or because patients could not complete the tool alone. However, clinical tools often need to be adapted to the local context. Changes in the format or wording of questions may be required to make them understandable to patients and/or acceptable to ED staff. The ISAR items were designed to be suitable for self-administration, but, even in the original study, many patients preferred to be asked in an interview format. Although the ISAR questions were carefully pre-tested both in English and French in the population of older patients in Montreal EDs where the original studies were conducted, this does not guarantee that they

will be understood similarly in other contexts. While researchers are often cautioned against making changes in previously validated instruments, appropriate adaptation may be preferable to deciding not to adopt an otherwise useful tool. Warburton et al., for example, used a series of audits to evaluate the process of implementation of ISAR in several EDs in British Columbia.³² In an incremental process, they identified questions either that were not well understood by nurses and patients, that resulted in a miscoding of items, or that required updating to reflect current practice (e.g., to reflect the increase in number of medications prescribed to this population in the last few years, the question "Do you take more than three different medications every day?" was replaced by "Do you take six or more medications every day?").

Strengths of this survey include the high participation rate among Quebec EDs. There are two main limitations. First, although we used a standardized approach to identify an appropriate respondent, the type of respondent (e.g., geriatrician vs. ED head nurse) may have influenced responses to the survey. Second, we used an unvalidated questionnaire to obtain information on implementation of screening and assessment tools. Some respondents may have been unaware of details of implementation or may have wished to present their ED in a positive light.

Conclusions/Recommendations

Better methods are needed to assist EDs in implementing methods to improve the care of their older patients. Before planning implementation strategies, it is important to do a systematic assessment of the practice environment and of potential users.³³ Strategies for successful implementation may require staff training and in-service updates, partnerships with EDs that have implemented these tools, adaptation of the tools, and pre-implementation testing.³² Resources need to be made available to conduct and follow-up on assessments and to monitor implementation. Linkages with other members of the health care network need to be created (geriatric services, in-patient care teams, primary care, home care, and other community services).

Efforts to increase the implementation of evidence-based tools in various health care settings should include multifaceted strategies to influence providers and policy makers. Approaches that have been successful in changing provider behaviour include educational outreach visits (e.g., academic detailing)³⁴ and use of local opinion leaders.³⁵ Strategies that may increase research use among policy makers include the use of brief documents, with relevant information highlighted (e.g., contextual factors that may affect

local application and information on benefits, risks, and costs).³⁶

Attention should also be paid to the information to be collected in the second step, the brief clinical assessment. The main goals of this assessment are to identify unmet needs that require follow-up and to transmit the results and follow-up recommendations to concerned individuals, whether in the hospital (for patients admitted) or in the community (for those discharged). The specific follow-up will vary by the local context and must take into account the availability of services. In Quebec, for example, good linkages are required with the CLSC, both for patients known and not previously known to the CLSC, for reassessment or initial assessment, respectively. Follow-up by the patient's primary physician is at least as important but harder to standardize and challenging to implement in areas that lack access to primary medical care.²⁵ It is important to know what information is needed by the physician and in what format. In transmission of information, a common language is an asset. Thus, in situations where home care services use standardized assessment tools, adaptations of these tools using similar definitions may facilitate communication. For patients admitted to hospital, appropriate follow-up may involve early discharge planning or referral to geriatric or psycho-geriatric consultation, again depending on the services available.

Three areas of research are important to improving best practice recommendations for older ED patients. First, validation studies are needed in different contexts of existing and adapted screening and assessment tools. Second, referral interventions that target the primary physician should be developed and evaluated. Third, comparative studies of the different ED organizational models and practices for older patients should be conducted, describing their structure, process, and outcomes.

References

1. Shah MN, Rathouz PJ, Chin MH. Emergency department utilization by non-institutionalized elders. *Acad Emerg Med* 2001;8(3):267–273.
2. Brown EM, Goel V. Factors related to emergency department use: results from the Ontario Health Survey 1990. *Ann Emerg Med* 1994;24(6):1083–1091.
3. Béland F, Lemay A, Philibert L, Maheux B, Gravel G. Elderly patients' use of hospital-based emergency services. *Med Care* 1991;29(5):408–416.
4. Denman SJ, Ettinger WH, Zarkin BA, Coon PJ, Casani JA. Short-term outcomes of elderly patients discharged from an emergency department. *J Am Geriatr Soc* 1989;37(10):937–943.
5. McCusker J, Ardman O, Bellavance F, Belzile E, Cardin S, Verdon J. Use of community services by seniors before and after an emergency visit. *Can J Aging* 2001;20(2):193–209.
6. McCusker J, Bellavance F, Cardin S, Belzile E, Verdon J. Prediction of hospital utilization among elderly patients during the six months after an emergency department visit. *Ann Emerg Med* 2000;36(5):438–445.
7. Adams JG, Gerson LW. A new model for emergency care of geriatric patients (Commentary). *Acad Emerg Med* 2003;10(3):271–274.
8. Currie CT, Lawson PM, Robertson CE, Jones A. Elderly patients discharged from accident and emergency departments: their dependency and support. *Arch Emerg Med* 1984;1(4):205–213.
9. Hedges JR, Singal BM, Rousseau EW, Sanders AB, Bernstein E, McNamara RM. Geriatric patient emergency visits, part 2: perceptions of visits by geriatric and younger patients. *Ann Emerg Med* 1992;21(7):808–813.
10. Brookoff D, Minniti-Hill M. Emergency department-based home care. *Ann Emerg Med* 1994;23(5):1101–1106.
11. Gerson LW, Rousseau EW, Hogna TM, Bernstein E, Kalbfleisch N. Multicenter study of case finding in elderly emergency department patients. *Acad Emerg Med* 1995;2:729–734.
12. Dalby DM, Sellors JW, Fraser FD, Fraser C, van Ineveld CHM, Pickard L, et al. Screening seniors for risk of functional decline: results of a survey in family practice. *Can J Public Health* 1999;90(2):133–137.
13. Bowns I, Challis D, Tong M. Case finding in elderly people: validation of a postal questionnaire. *Br J Gen Pract* 1991;41:100–104.
14. Pacala JT, Boulton C, Boulton L. Predictive validity of a questionnaire that identifies older persons at risk for hospital admission. *J Am Geriatr Soc* 1995;43(4):374–377.
15. Hébert R, Bravo G, Korner-Bitensky N, Voyer L. Predictive validity of a postal questionnaire for screening community-dwelling elderly individuals at risk of functional decline. *Age Ageing* 1996;25:159–167.
16. McCusker J, Kakuma R, Abrahamowicz M. Predictors of functional decline in the hospitalized elderly: a systematic review. *J Gerontol A Biol Sci Med Sci* 2002;57A(9):M569–M577.
17. McCusker J, Bellavance F, Cardin S, Trépanier S, Verdon J, Ardman O. Detection of older people at increased risk of adverse health outcomes after an emergency visit: the ISAR screening tool. *J Am Geriatr Soc* 1999;47(10):1229–1237.

18. McCusker J, Cardin S, Bellavance F, Belzile É. Return to the emergency department among elders: patterns and predictors. *Acad Emerg Med* 2000;7(3):249–259.
19. Dendukuri N, McCusker J, Belzile E. The Identification of Seniors at Risk screening tool: further evidence of concurrent and predictive validity. *J Am Geriatr Soc* 2004;52(2):290–296.
20. Meldon SW, Mion LC, Palmer RM, Drew BL, Connor JT, Lewicki LJ. A brief risk-stratification tool to predict repeat emergency department visits and hospitalization in older patients discharged from the emergency department. *Acad Emerg Med* 2003;10(3):224–232.
21. McCusker J, Verdon J, Tousignant P, Poulin de Courval L, Dendukuri N, Belzile E. Rapid emergency department intervention for elders reduces risk of functional decline: results of a multi-centre randomized trial. *J Am Geriatr Soc* 2001;49(10):1272–1281.
22. McCusker J, Jacobs P, Dendukuri N, Latimer E, Tousignant P, Verdon J. Cost-effectiveness of a brief 2-stage emergency department intervention for high risk elders: results of a quasi-randomized controlled trial. *Ann Emerg Med* 2003;41(1):45–56.
23. Caplan GA, Williams AJ, Daly B, Abraham K. A randomized controlled trial of comprehensive geriatric assessment and multidisciplinary intervention after discharge of elderly from the emergency department: the DEED II study. *J Am Geriatr Soc* 2004;52(9):1417–1423.
24. Runciman P, Currie C, Nicol M, Green L, McKay V. Discharge of elderly people from an accident and emergency department: evaluation of health visitor follow-up. *J Adv Nurs* 1996;24:711–718.
25. McCusker J, Dendukuri N, Tousignant P, Verdon J, Poulin de Courval L, Belzile E. Rapid two-stage emergency department intervention for seniors: impact on continuity of care. *Acad Emerg Med* 2003;10(3):233–243.
26. Hulscher M, Wensing M, van der Weijden T, Grol R. Interventions to implement prevention in primary care. *Cochrane Database of Systematic Reviews* 1997;(1).
27. Fournier MA, Leclerc C, Contandriopoulos AP, Kergoat MJ, Latour J, Lebel P, et al. Les unités de courte durée gériatriques au Québec: portrait de la situation. Montréal, QC: Groupe de recherche interdisciplinaire en santé (GRIS); 1999. p. R99–R108.
28. Hébert R, Durand PJ, Dubuc N, Tourigny A. Frail elderly patients. new model for integrated service delivery. *Can Fam Physician* 2003;49:992–997.
29. Goldberg T, Chavin S. Preventive medicine and screening in older adults. *J Am Geriatr Soc* 1997;45:344–354.
30. Rogers E. Diffusion of innovations. 5th ed. New York: Free Press; 2003.
31. Last JM. A dictionary of epidemiology. New York: Oxford University Press; 2001.
32. Warburton RN, Parke B, Church W, McCusker J. Identification of seniors at risk: process evaluation of a screening and referral program for patients aged 75 and over in a community hospital emergency department. *Int J Health Care Qual Assur* 2004;17(6):339–348.
33. Logan J, Graham ID. Toward a comprehensive interdisciplinary model of health care research use. *Sci Commun* 1998;20(2):227–246.
34. O'Brien TM, Oxman A, Davis D, Haynes R, Freemantle N, Harvey E. Educational outreach visits: effects on professional practice and health care outcomes. *Cochrane Database of Systematic Reviews* 1997;(4).
35. Thomson O'Brien M, Oxman A, Davis D, Freemantle N, Harvey E. Local opinion leaders: effects on professional practice and health care outcomes. *Cochrane Library* 2000;(1):13.
36. Lavis J, Davies H, Oxman A, Denis J-L, Golden-Biddle K, Ferlie E. Towards systematic reviews that inform health care management and policy-making. *J Health Serv Res Policy* 2005;10(Supp 1):S1–S35.