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GERIATRIC EMERGENCY CARE: POLICY RECOMMENDATIONS

This document emanates from a "think-tank" held in conjunction with the Geriatric Program, International Interdisciplinary Conference on Emergencies, Montreal, June 29th 2005 (IICE 2005)

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ABSTRACT

Today, the special features of an aging population challenge many health authorities in western developed countries. Hospital emergency services have become a major focus of public concern. Media attention has highlighted emergency department (ED) backlogs, and long waits for in-patient beds and diagnostic tests and procedures. This has raised concern about patient safety, the timeliness of ED services, and the quality of care provided in this acute care treatment setting.

A geriatric program took place at the first International Interdisciplinary Conference on Emergencies (IICE) held in Montreal in June 2005 that recognized the special features that an aging population brings to emergency services. A public round table discussion was followed by a think-tank session that involved interdisciplinary experts knowledgeable in geriatric emergency service from six countries. Recommendations for best practice to advance ED care and service delivery to older adults were developed using a nominal group process. This was followed by several rounds of input to develop consensus in the rankings, and input from outside experts. Seven categories of recommendations were developed: education, integration and coordination of care, resources, ED physical environment, evidence based practice, research and evaluation, and advocacy. These recommendations may assist researchers, administrators, policy-makers, and clinicians on future directions for improving emergency care and service delivery.

INTRODUCTION

Today, the special features of an aging population challenges many health authorities in western developed countries. Hospital emergency services have become a major focus of public concern. Media attention has highlighted emergency department (ED) backlogs, and long waits for in-patient beds and diagnostic tests and procedures. This has raised concern about patient safety, the timeliness of ED services, and the quality of care provided in this acute care treatment setting.

The ED is a conduit in the flow of patients through the hospital system and is an important link between an in-patient hospital admission and the community (1). The literature recognizes older adults (2) as a distinct population group that have multiple unmet needs (i.e., medical, functional, cognitive, and social support) necessitating a coordinated emergency geriatric interdisciplinary response (3-6). Not only does this population require a different approach to care, their vulnerability to adverse outcomes and functional decline may perpetuate dependence on the health care system (1, 7, 8).

The first International Interdisciplinary Conference on Emergencies (IICE) held in Montreal in June 2005 recognized the special features that an aging population brings to emergency services. At this conference, a special geriatric program took place, which brought researchers, clinicians, and administrators from different countries together for the first time to dialogue on issues pertaining to older adults in the ED.

Part of the geriatric program included a public round table discussion and think-tank session sponsored by Fraser Health in British Columbia, Canada (See Appendix A). This activity involved interdisciplinary experts knowledgeable in geriatric emergency service from multiple countries. This session attempted to extend the work done by the

American Geriatric Society research agenda setting activity (RASP): "New Frontiers in Geriatrics Research: An Agenda for Surgical and Related Medical Specialties" (9). The aim was to develop policy recommendations to advance ED care and service delivery to older adults (4). This paper describes the process participants underwent to identify policy categories and reports the recommendations that emerged from the think tank event. Substantiating evidence provides the rationale for the recommendations.

BACKGROUND TO POLICY DIRECTIONS

Older adults are frequent users of hospital services and are more likely than younger adults to use such services (10). For example, national trends in 1997/98 indicated that older adults accounted for 35% of the 3 million discharges from Canadian hospitals and 52% of the 21 million patient days, and nearly one-third of all primary diagnostic and surgical procedures performed in hospitals during this time (11).

The demand for emergency services is related to numerous and concurrent factors that include increased age of the population with increased acuity, limited access to primary care physicians, and lack of community-based alternatives (12, 13). Compared to younger ages, older people not only use hospital EDs at higher rates, they use more resources during a visit, have greater level of urgency, stay longer in the ED, and are more likely to make a return visit (2, 7, 14). Older adults also experience higher rates of adverse health outcomes after discharge (7) and when asked older people report need for more information and improved communication with ED professionals (15).

Canadian Institute for Health Information (CIHI) data indicate that 18.3% of women and 15.1% of men who utilized the ED in 2001 were over the age of 65, they

were triaged at levels requiring significant acute care interventions, and most were discharged to return to their place of residence in the community. Overall, available data suggest that the numbers of older adults (65+) who come to the ER are acutely ill, have high levels of morbidity, and are more often admitted to hospital (See Appendix B – Tabulated CIHI Data).

Although older adults in the ED are a heterogeneous group, evidence indicates that they experience a preponderance of chronic health needs in conjunction with advancing age. Heart disease, hypertension and stroke, respiratory illness, diabetes, digestive problems, and arthritis are among the most prevalent chronic conditions (11, 16, 17) In 1996, 82% of all older adults living at home had a chronic health condition and 28% were limited in at least some activities because of the chronic condition (17). In addition, 25% of all older adults living at home and 45% of those aged over 85 had a long-term disability (17, 18). Up to 67% of direct health care costs in British Columbia, Canada are spent on these chronic conditions (19).

The trend for chronic illnesses to accumulate with advancing age leads to deterioration in functioning and a rise in disability, and dependence (3). Evidence indicates that responding to the needs of older people requires coordinated, comprehensive and integrated community based health, rehabilitation, and social services (7, 9).

Predictors of ED visits in older people are primarily related to need and include medical diagnoses, cognitive ability, functional ability, number of medications and co-morbid problems, and previous visits to the ED or an overnight hospitalization (5, 20-24). In addition to need, problems with access to and continuity of primary care contribute to

increased ED utilization (5). Potentially avoidable adverse events following an ED visit in this population include functional decline, return ED visits, hospitalization, nursing home admission, and death (25).

Controlled trials conducted in several countries – Canada (26), United States (27), United Kingdom (28), Australia (29) – have reported that some adverse events can be prevented or ameliorated by ED based geriatric interventions (e.g., nurse liaison and discharge planning). However, the degree to which these approaches are adopted by hospitals and their effects on patient safety are not well understood. Furthermore, the contextual factors that may affect these outcomes (hospital and community) require further investigation. Specific components of the organization of hospitals that require investigation include: availability and deployment of resources; linkages and communication to and from the ED with community physicians and home care services.

Other intervention studies have been conducted to reduce the frequency of in patient admissions, repeat visits, and inappropriate visits to the ED. The interventions have ranged from multidisciplinary teams located in the ED to consultative models integrating case finding and referral processes with community based deployment of resources (30-36). Appendix C contains a list of relevant intervention studies; differences in study methodology, type of intervention and target populations have yielded variable results.

The busy, often hectic ED environment promotes a focus on rapid treatment and disposition of patients. A failure to address the special features of an aging population may contribute to premature discharge and increased rates of return visits and other adverse outcomes that affect patient safety. Challenges to safety are of critical

importance to the ED and the care of older patients, whose higher levels of comorbidity, physical and cognitive impairment, and polypharmacy make them particularly vulnerable. Policy direction is needed to focus efforts to: (a) improve ED response to the aging population at both the hospital and community level, and (b) determine the efficacy of innovations in home care services, types and availability of primary care services, and the integration of services between hospital ED and home.

METHODS

Round table discussion

Attendees at the session heard presentations from eight expert panelists. Each panelist presented from the perspective of their discipline and their professional experience in the field of geriatric emergency, their views on two questions:

1. What are the gaps between current and best practices?
2. What is needed to achieve best practice?

Attendees of the round table discussion were also given the opportunity to respond to the same questions. Scribes collected the comments and questions made by attendees and the panelists' responses.

Think tank session

In the think tank session, the expert panelists joined other invited participants to continue the discussions begun at the round table session. The purpose of the think-tank was to introduce an interdisciplinary and international dimension to the medically based RASP document (9) by striving for consensus on policy recommendations. The policy recommendations offered future directions to advance interdisciplinary best practice for

geriatric emergency care and service delivery. As background information, participants reviewed the RASP article before the think tank session to be familiar with previous research, and to provide their discipline's perspectives to the deliberations.

A nominal group (NG) technique (37) was chosen as the approach best suited for problem exploration and knowledge sharing to arrive at group consensus. This technique is defined as a consensus planning tool that helps prioritize issues. The NG technique followed five steps.

Step 1: Silent generation of ideas in writing

Think tank participants divided into smaller groups. Participants spent several minutes in silence privately considering their answer to this question: *What policy recommendations are needed to bridge the gap and advance geriatric best practice in the emergency department?* Once silently generating ideas, each group brainstormed answers to the question; a facilitator kept the discussion moving and on topic while a participant took discussion notes.

Step 2: Round-robin recording of ideas on flipchart

While in groups, ideas were shared in round-robin style (one at a time) and responses recorded on flipchart. The process continued until each participant offered his or her first priority choice. This was following by small group discussion.

Step 3: Serial discussion for clarification

Small groups reported their first four priorities and provided explanations as needed. All participants debated the relevance of the priorities to current practice. Notes from these discussions were compiled on large format flip-charts, which later served as visual tools for the voting process.

Step 4: Preliminary vote on item of importance

Participants ranked, in order of importance, the ideas recorded on the flipchart. Flipchart sheets were collected and results tabulated in conjunction with participant feedback from the small group discussions. Voting was done by giving all participants colored stickers (i.e., gold, silver, red and blue) denoting different point values (i.e., 4, 3, 2, and 1 respectively). Participants placed these stickers on flipcharts that displayed the recommendations. For example, a gold sticker was awarded four points, while a blue sticker was awarded one point. The prioritizing of recommendations and the point scoring method permitted the group to give some topics more point value when there was a tie in the score. Table one displays first round voting results:

Table One: Round One Voting Tabulations

Rank	Recommendation	Gold	Silver	Red	Blue	**TOTAL**
1	Education	16	9	10	5	40
2	Integration/coordinated care	12	15	10	3	40
3	Basic resources	20	6		1	27
4	Micro-environment	4	15	4	4	27
5	Evidence-based practice	12		10	2	24
6	Research	4	6	4	5	19
7	Government and policy commitment	16		2		18
8	Informatization	4	3	2	1	10
9	Access to geriatric specialists in the ED		3		3	
10	Resources in the ED		3			3
11	Allocate budgets		3			3
12	Advocacy/lobbying			2	1	3
13	Process and systems					

Step 5: Discussion of the preliminary vote

Clarification of preliminary vote was discussed briefly with the goal being to achieve consensus. Participants debated the results and provided further justification for

their views. This resulted in a final vote for the session. Step 4 was repeated after the session once all information was tabulated; the final vote was conducted electronically.

Data Management and Analysis

At the conclusion of the event, the information compiled from the working groups and public round table presentations was reconstructed using a constant comparative analysis method (38). The reconstruction followed these steps: (a) transcribing of flip-charts and scribed notes, (b) validating and integrating participant feedback; and (c) analyzing and categorizing to eliminate obvious duplication and redundancy.

Participants electronically validated the resulting documents. Descriptive attributes for the categories were organized into recommendation statements. Several categories were collapsed in round two of the nominal group process to form a single category, thereby reducing the numbers to seven, from thirteen. Each category had a corresponding definition. At the conclusion of the round nominal group process, participants nominated an external reviewer to provide feedback and validate the final policy recommendations. Eleven people were nominated and four accepted the invitation to be an external reviewer.

RESULTS: POLICY RECOMMENDATIONS

The categories represent policy issues that participants identified as critical to improving or achieving best practice in emergency services for older adults. The categories and corresponding recommendations are rank ordered (most important to least important). Prioritization of the categories and recommendations remained constant throughout the process. Noteworthy however, was that academic and clinical experts

prioritized differently; academic participants placed greater emphasis on generating new knowledge while clinicians and administrators focused more attention on operational aspects of care and service delivery. Both groups saw the transfer of new knowledge into operations as critical. The following categories and recommendations are a synthesis of all participants' contributions.

POLICY CATEGORIES AND RECOMMENDATIONS

CATEGORY ONE: EDUCATION

Working definition:
Formal activities that:

(a) increase the skill and knowledge of professionals practicing in emergency and gerontological fields;
(b) foster interdisciplinary collaboration and promote role clarity; and
(c) foster independent self care in the citizenry.

1.1 Education

Recommendations

1.1.1 Lobby accrediting educational organizations and professional associations for curriculum changes requiring interdisciplinary gerontology.

1.1.2 Lobby educational institutions to implement interdisciplinary gerontological curriculum in undergraduate, graduate and postgraduate health programs.

1.1.3 Develop interdisciplinary geriatric core competencies.

1.1.4 Develop and provide focused professional education to increase the skill and knowledge level of ED personnel.

1.1.5 Develop and provide educational self-care materials for interested and able older adults and their families.

CATEGORY TWO: INTEGRATION & COORDINATION OF CARE

Working definition:
The combining of hospital and community activity; a fluid and responsive system that acts in a harmonious whole.

2.1 Infrastructure, systems and processes (i.e., strengthen the community response for vulnerable older populations).

Recommendations

2.1.1 Establish local acute care hospital operational mechanisms to aid prioritization of access to services in the flow between ED, hospital in-patient, and community.

2.1.2 Increase the repertoire of ED service options (e.g., deploy short-term community home support from the ED, expand community options for early intervention).

2.1.3 Establish joint ED – community service collaboratives to develop innovations in the managing transition and continuity of care in the older frail population (i.e., integrated chronic disease management pathways for older people).

2.1.4 Establish mechanisms for early detection of remediable problems (i.e., high risk screening and surveillance processes in the community and ED) to ensure the right geriatric services are deployed at the right time and in the right location from the ED.

2.1.5 Develop community-based mental health programs and resources.

2.1.6 Conduct innovative pilot projects to determine efficacy of other models of service delivery (i.e., post-triage geriatric ED, assessment and observation units, Seniors' specific ED).

2.1.7 Develop shared-care models and new linkages in community provider partnerships (i.e., nurse practitioners, paramedic, community, pharmacists, case managers, and other first responders).

2.1.8 Develop mechanism for 24 hour access to primary care physicians.

2.2 Communication

Recommendations

2.2.1 Improve communication and information exchange between services, partners in integrated networks, and amongst interdisciplinary team members (i.e., primary care providers, the ED and older people and their families).

2.2.2 Conduct interviews with older people and families to determine the effectiveness of ED services.

2.2.3 Establish mechanisms for troubleshooting issues of concern.

2.2.4 Utilize information technology to support inter and intra service delivery across the continuum.

2.3 Information Systems

Recommendations

2.3.1 Establish timely access to data base information in ED amongst various interdisciplinary providers.

2.3.2 Strengthen the role of the primary care practitioner by improving reciprocal access to information to and from family physicians and the ED.

CATEGORY THREE: RESOURCES

Working definition:
Anything that is required to achieve improved care and service to older people in the ED (i.e., financial and people with expertise).

3.1 Access to interdisciplinary geriatric specialist in the ED

Recommendations

3.1.1 Establish interdisciplinary staffing levels that reflect the needs of geriatric ED patient by expanding clinical expertise in the ED to include occupational therapist, physiotherapist, clinical pharmacist, geriatric nurse, social worker and geriatrician.

3.2 Local infrastructure support

Recommendations

3.2.2 Redeploy existing interdisciplinary resources to balance prevention of admission ***to*** hospital versus discharge ***from*** hospital.

3.2.3 Provide infrastructure supports to interdisciplinary team members such as computers, access to literature, customized quick assessment and reference tools, and education.

3.2.4 Establish ED systems and processes that are culturally age sensitive.

3.3 Provide additional funding

Recommendations

3.3.1 Conduct a review to make recommendations of the funding processes for ED physicians, and interdisciplinary geriatric specialist remuneration.

3.3.2 Reallocate health care resources to support innovations that maintain older people at home thereby diminishing the likelihood of non-urgent treatment in EDs.

CATEGORY FOUR: ED PHYSICAL ENVIRONMENT

Working definition:
The observable built environment of the ED; its architectural features, physical configuration, equipment, furnishings, and décor.

4.1 ED Physical Environment

Recommendations

4.1.1 Establish a physical environment that supports safety and promotes independent function. Key elements include furniture, lighting, signage/wayfinding, and appropriate equipment.

4.1.2 Provide ED with appropriate equipment and physical design features to support functional ability in older patients.

4.1.3 Conduct research to establish evidence on physical environment improvements to determine the efficacy of design interventions.

CATEGORY FIVE: EVIDENCE BASED PRACTICE
(closely linked to research category)

Working definition:
This category focuses on knowledge translation into the work place. Therefore, evidence is information and knowledge acquired through scientific evaluation of practice. The continuous use of the best available interdisciplinary knowledge in geriatric and emergency clinical decision making involves the incorporation of evidence from research, clinical expertise, and older adult preferences that inform decisions about older people in the ED.

5. 1 Evidence Based Practice

Recommendations

5.1.1 Enhance knowledge translation from research to build evidenced based practice (EBP) for geriatric conditions, syndromes and disease management.

5.1.2 Implement clinical tools based on clinical practice guidelines and best practice standards.

5.1.3 Develop geriatric ED best practice standards for all disciplines.

5.1.4 Establish continuous quality improvement (CQI) incorporating principles of geriatric best practice.

5.1.5 Establish core competencies for assessment and diagnosis of atypical presentations of disease and illnesses (i.e., abdominal pain, cognitive impairments, infection).

5.1.6 Develop ED mechanism for routine risk screening (i.e., falls, elder abuse).

5.1.7 Establish national geriatric ED quality standards.

CATEGORY SIX: RESEARCH AND EVALUATION

Working Definition:
A systematic approach to answering questions relevant to the health and welfare of older people in the ED.

6.1 Research and Evaluation

Recommendations

6.1.1 Establish an international interdisciplinary research agenda on ED best practice in geriatrics, health services, and clinical research.

6.1.2 Establish standards, ED interdisciplinary geriatric-specific measurable outcomes that are attainable and realistic.

6.1.3 Establish appropriate measurable geriatric emergency medicine specific outcomes.

CATEGORY SEVEN: ADVOCACY

Working Definition:
The initiation and supporting of action to meet the needs of older people visiting the ED.

7.1 Advocacy

Recommendations

7.1.1 Develop a coordinated plan to sensitize and raise awareness, lobby for policy development and funding in the political sphere (i.e., government, non government [seniors] organizations (NGO), citizenry).

7.1.2 Develop networks, coalitions and linkages with decision makers for political support.

7.1.3 Establish alliances with existing professional organizations.

Summary

Generally all think tank participants and external reviewers agreed to the ranking and categorizing of recommendations with the exception of two categories. One participant believed that Category Five: Evidenced Based Practice should be ranked first before all others because in their opinion, all other recommendations must flow from evidenced based practice. An external reviewer argued that Category Four: Physical Environment should be ranked seventh. The following additional recommendations were suggested and incorporated in the document:

Category One: Education - Provide professional education for geriatric health care professionalism about emergency medical care and educate patients about the appropriate use of the EMS system and ED;

Category Two : Communication – A need to include information on transfers between EDs and skilled Nursing Facilities;

Category Three: Resources – A need for ED and EMS resources for a prepared surge in increased capacity suggesting that "the EMS system and ED in many communities are facing serious issues of overcrowding and limited resources. In the future, resources must be available to meet the significant increased ED use as the number of elder patients increase in many countries. This will further strain our limited capacity" (External Reviewer 2).

Category Five: Research and Evaluation – Increase funding for geriatric EM research to advance quality care.

CONCLUSION

An ED visit by an older person is a sentinel event often associated with new needs for treatment and/or services. The appropriate management of this event may have important implications for long-term safety, morbidity and ongoing utilization. Focused attention and coordinated efforts are required to advance the clinical care and organizational health services.

The paper has compiled the best practice evidence presented at the round table and think tank session during Geriatric Program at the IIEC '05 conference, and formulated recommendations that emanated from these two events. The synthesis of this information could potentially assist researchers, administrators, and clinicians on future directions for improving emergency care and service delivery.

APPENDIX A

Fraser Health (FH) is a geographically large area representing 22 municipalities and is the fastest growing health region in British Columbia. Every year the population grows by about 25 000 people more than half the total growth of the province. Currently FH serves 1.5 million people and by 2020 the population is expected to rise to 1.91 million.

The demand for health services in FH is expected to increase and become more complex due to growth and demographic shifts. Currently 13% of the population is 65 years old and by 2010 the over 65 population is expected to increase by 23% or 41 500 people.

Population projections show the 65+ age group by 2010 to total 210 000 people with 30 000 being over the age of 85 and 70 000 over the age of 75. This has significant implications to all elements of health care services.

As a health region, FH has responsibility for prevention, mental health, home and community care, residential and acute care services. FH has twelve acute care hospital sites, and over 7 000 residential care beds. FH has over 22 000 direct and contracted employees.

APPENDIX B

Tabulated Data from the Canadian Institute for Health Information (CIHI)

Data Source

- National Ambulatory Care Reporting System (NACRS) - CIHI -2001. The data were abstracted from the CIHI website in www.cihi.ca

Methodology Notes

- Emergency Department (ED) visits for fiscal 2001 (April 1st, 2001 - March 31st, 2002) are included; fiscal 2001 is the first complete year of data for the NACRS database.

- Ontario hospitals are mandated by the Ontario Ministry of Health and Long Term Care to submit emergency visits to the NACRS database; also included is data from one facility from Nova Scotia and one from British Columbia.

Interpretation of Data

Data presented represent the number of ED visits by age at time of registration and gender.

Visit disposition refers to one of the following types of separation from the ED:

1. Admitted as inpatient (includes admitted to critical care unit or operating room)
2. Deaths (includes death in emergency and death on arrival
3. Discharged to place of residence
4. Left against medical advice /refused treatment
5. Other (includes client not seen by health care provider, transfers to other facilities and transfers to day surgery, emergency of clinics in the same facility)

The following five **levels of triage** for ED visits were developed by the Canadian Association of Emergency Physicians (CAEP) with definitions as per the Canadian Emergency Department Triage and Acuity Scale (CTAS).

1. Resuscitation - conditions that are threats to life or limb (or imminent risk of deterioration) requiring immediate aggressive interventions.
2. Emergent - conditions that are a potential threat to life, limb, or function, requiring rapid medical intervention or delegated acts.
3. Urgent - conditions that could potentially progress to a serious problem requiring emergency intervention. May be associated with significant discomfort or affecting ability to function at work or activities of daily living.
4. Less-urgent - conditions that related to patient's age, distress, or potential for deterioration or complications that would benefit from intervention or reassurance within 1-2 hours.
5. Non-urgent - conditions that may be acute but non-urgent as well as conditions which may be part of a chronic problem with or without evidence of deterioration. The investigation or interventions for some of these illnesses or injuries could be delayed or even referred to other areas of the hospital or health care system.

Table 1 Number of ED visits by age and sex

	Total		Female		Male	
	n	%	n	%	n	%
All ages	4,782,288	100.0	2,413,540	100.0	2,368,748	100.0
<65	3,982,703	83.3	1,972,076	81.7	2,010,627	84.9
65-74	359,601	7.5	181,480	7.5	178,121	7.5
75-84	315,683	6.6	178,630	7.4	137,053	5.8
85+	124,301	2.6	81,354	3.4	42,947	1.8

Table 2 Number of ED visits by main problem, age and sex

	Total		AMI		Asthma		Pneumonia		Trauma		Other	
	n	%	n	%	n	%	n	%	n	%	n	%
Total												
All ages	4,782,288	100.0	13,078	0.3	80,595	1.7	57,058	1.2	1,166,769	24.4	3,464,788	72.5
<65	3,982,703	100.0	5,357	0.1	75,370	1.9	34,727	0.9	1,050,194	26.4	2,817,055	70.7
65-74	359,601	100.0	3,187	0.9	2,912	0.8	7,290	2.0	49,458	13.8	296,754	82.5
75-84	315,683	100.0	3,048	1.0	1,810	0.6	9,326	3.0	44,021	13.9	257,478	81.6
85+	124,301	100.0	1,486	1.2	503	0.4	5,715	4.6	23,096	18.6	93,501	75.2
Female												
All ages	2,413,540	100.0	4,598	0.2	40,464	1.7	27,014	1.1	471,346	19.5	1,870,118	77.5
<65	1,972,076	100.0	1,126	0.1	37,232	1.9	15,988	0.8	399,216	20.2	1,518,514	77.0
65-74	181,480	100.0	1,140	0.6	1,684	0.9	3,371	1.9	26,603	14.7	148,682	81.9
75-84	178,630	100.0	1,438	0.8	1,199	0.7	4,362	2.4	28,503	16.0	143,128	80.1
85+	81,354	100.0	894	1.1	349	0.4	3,293	4.0	17,024	20.9	59,794	73.5
Male												
All ages	2,368,748	100.0	8,480	0.4	40,131	1.7	30,044	1.3	695,423	29.4	1,594,670	67.3
<65	2,010,627	100.0	4,231	0.2	38,138	1.9	18,739	0.9	650,978	32.4	1,298,541	64.6
65-74	178,121	100.0	2,047	1.1	1,228	0.7	3,919	2.2	22,855	12.8	148,072	83.1
75-84	137,053	100.0	1,610	1.2	611	0.4	4,964	3.6	15,518	11.3	114,350	83.4
85+	42,947	100.0	592	1.4	154	0.4	2,422	5.6	6,072	14.1	33,707	78.5

AMI: Acute myocardial infarction

Table 3 Number of ED visits by triage level, age and sex

	Total		Resuscitation		Emergent		Urgent		Less-urgent		Not-urgent	
	n	%	n	%	n	%	n	%	n	%	n	%
Total												
All ages	4,782,288	100.0	16,554	0.3	248,955	5.2	1,456,483	30.5	2,092,146	43.7	968,150	20.2
<65	3,982,703	100.0	9,346	0.2	163,743	4.1	1,124,432	28.2	1,840,043	46.2	845,139	21.2
65+	799,585	100.0	7,208	0.9	85,212	10.7	332,051	41.5	252,103	31.5	123,011	15.4
Female												
All ages	2,413,540	100.0	6,513	0.3	116,936	4.8	768,145	31.8	1,053,064	43.6	468,882	19.4
<65	1,972,076	100.0	3,317	0.2	72,359	3.7	582,839	29.6	908,852	46.1	404,709	20.5
65+	441,464	100.0	3,196	0.7	44,577	10.1	185,306	42	144,212	32.7	64,173	14.5
Male												
All ages	2,368,748	100.0	10,041	0.4	132,019	5.6	688,338	29.1	1,039,082	43.9	499,268	21.1
<65	2,010,627	100.0	6,029	0.3	91,384	4.5	541,593	26.9	931,191	46.3	440,430	21.9
65+	358,121	100.0	4,012	1.1	40,635	11.3	146,745	41.0	107,891	30.1	58,838	16.4

Table 4 Number of ED visits by visit disposition, age and sex

	Total		Admitted		Death		Discharge		LMA		Other	
	n	%	n	%	n	%	n	%	n	%	n	%
Total												
All ages	4,782,288	100.0	485,663	10.2	6,246	0.1	4,052,713	84.7	129,337	2.7	108,329	2.3
<65	3,982,703	100.0	259,379	6.5	2,473	0.1	3,510,556	88.2	120,361	3.0	89,934	2.3
65+	799,585	100.0	226,284	28.3	3,773	0.5	542,157	67.8	8,976	1.1	18,395	2.3
Female												
All ages	2,413,540	100.0	249,831	10.4	2,184	0.09	2,046,307	84.8	63,535	2.6	51,683	2.1
<65	1,972,076	100.0	126,499	6.4	695	0.04	1,744,234	88.5	58,908	3.0	41,740	2.1
65+	441,464	100.0	123,332	27.9	1,489	0.34	302,073	68.4	4,627	1.1	9,943	2.3
Male												
All ages	2,368,748	100.0	235,832	10.0	4,062	0.17	2,006,406	84.7	65,802	2.8	56,646	2.4
<65	2,010,627	100.0	132,880	6.6	1,778	0.09	1,766,322	87.9	61,453	3.1	48,194	2.4
65+	358,121	100.0	102,952	28.8	2,284	0.64	240,084	67.0	4,349	1.2	8,452	2.4

LMA: left against medical advice

Table 5 Number of ED visits by triage level, age and main problem

	Total		Resuscitation		Emergent		Urgent		Less-urgent		Not-urgent	
	n	%	n	%	n	%	n	%	n	%	n	%
AMI												
All ages	13,078	100.0	1,305	10.0	6,044	46.2	5,019	38.4	549	4.2	161	1.2
<65	5,357	100.0	492	9.2	2,749	51.3	1,847	34.5	202	3.8	67	1.3
65+	7,721	100.0	813	10.5	3,295	42.7	3,172	41.1	347	4.5	94	1.2
Asthma												
All ages	80,595	100.0	284	0.4	9,435	11.7	40,803	50.6	23,637	29.3	6,436	8
<65	75,370	100.0	264	0.4	8,671	11.5	37,994	50.4	22,489	29.8	5,952	7.9
65+	5,225	100.0	20	0.4	764	14.6	2,809	53.8	1,148	22	484	9.3
Pneumonia												
All ages	57,058	100.0	267	0.5	6,452	11.3	29,133	51.1	17,310	30.3	3,896	6.8
<65	75,370	100.0	88	0.3	2,857	8.2	16,140	46.5	12,761	36.7	2,881	8
65+	5,225	100.0	179	0.8	3,595	16.1	12,993	58.2	4,549	20.4	1,015	4.5
Trauma												
All ages	1,166,769	100.0	3,118	0.3	28,718	2.5	233,768	20	652,325	55.9	248,840	21.3
<65	1,050,194	100.0	2,671	0.3	24,729	2.4	195,430	18.6	595,893	56.7	231,471	22
65+	116,575	100.0	447	0.4	3,989	3.4	38,338	32.9	56,432	48.4	17,369	14.9
Other												
All ages	3,464,788	100.0	11,580	0.3	198,306	5.7	1,147,760	33.1	1,398,325	40.4	708,817	20.5
<65	2,817,055	100.0	5,831	0.2	124,737	4.4	873,021	31	1,208,698	42.9	604,768	21.5
65+	647,733	100.0	5,749	0.9	73,569	11.4	274,739	42.4	189,627	29.3	104,049	16.1

AMI: Acute myocardial infarction

Table 6 Number of ED visits by visit disposition, age and main problem

	Total		Admitted		Death		Discharge		LMA		Other	
	n	%	n	%	n	%	n	%	n	%	n	%
AMI												
All ages	13,078	100.0	11,439	87.5	875	6.7	216	1.7	28	0.2	520	4.0
<65	5,357	100.0	4,698	87.7	248	4.6	98	1.8	16	0.3	297	5.5
65+	7,721	100.0	6,741	87.3	627	8.1	118	1.5	12	0.2	223	2.9
Asthma												
All ages	80,595	100.0	8,443	10.5	6	0.01	70,849	87.9	718	0.9	579	0.7
<65	75,370	100.0	7,260	9.6	5	0.01	66,847	88.7	703	0.9	555	0.7
65+	5,225	100.0	1,183	22.6	1	0.02	4,002	76.6	15	0.3	24	0.5
Pneumonia												
All ages	57,058	100.0	21,584	37.8	66	0.1	34,568	60.6	88	0.2	752	1.3
<65	75,370	100.0	7,557	21.8	15	0.04	26,596	76.6	67	0.2	492	1.4
65+	5,225	100.0	14,027	62.8	51	0.2	7,972	35.7	21	0.1	260	1.2
Trauma												
All ages	1,166,769	100.0	41,903	3.6	514	0.04	1,075,613	92.2	20,529	1.8	28,210	2.4
<65	1,050,194	100.0	22,991	2.2	395	0.04	983,563	93.7	19,629	1.9	23,616	2.3
65+	116,575	100.0	18,912	16.2	119	0.1	92,050	79.0	900	0.8	4,594	3.9
Others												
All ages	3,464,788	100.0	402,294	11.6	4,785	0.1	2,871,467	82.9	107,974	3.1	78,268	2.3
<65	2,817,055	100.0	216,873	7.7	1,810	0.1	2,433,452	86.4	99,946	3.6	64,974	2.3
65+	647,733	100.0	185,421	28.6	2,975	0.5	438,015	67.6	8,028	1.2	13,294	2.1

AMI: Acute myocardial infarction

LMA: left against medical advice

APPENDIX C

SELECTED INTERVENTIONS

Examples of published intervention studies of service models aimed at older adults in the ED (or pre-ED) include:

1. Social worker in ED to assess and council and provide referral to other services for social and mental health needs (33).
2. The application of individualized patient care plans, multidisciplinary case management and practice guidelines (30, 31, 36).
3. Monthly group visits (8 to 12 older adults) with primary care physician, pharmacist and nurse. Emphasis in group visit was self management of chronic illness, peer support and regular contact with primary care team (39).
4. Admission Avoidance Teams for rapid assessment, careful selection of patients and close liaison between community and emergency room teams (40).
5. SIGNET – the "Systematic Intervention for a Geriatric Network of Evaluation and Treatment" program. Targets case finding of at risk older people in the ER setting and to improve care planning and referral of these individuals upon discharge. This program model aims to coordinate networks of medical, nursing and social services. The geriatric resources were located in the ED setting (34).
6. Multidisciplinary care coordination team to improve ED discharge planning service. An intervention study to determine the effectiveness of interdisciplinary team assessment located in the ED aimed at facilitating patients return to or maintenance in the community (35).
7. A pre-hospital care intervention to decrease ED use by patients with non-urgent conditions. Pre-hospital care intervention - offered care at different clinically based locations that included ER, a clinic and at home (41).
8. Increased emergency physician coverage, designation of physician coordinators and new hospital policies regarding laboratory, consultation and admission procedures to affect ED over crowding (42).
9. A 2 –step intervention (ISAR-2) comprising ED screening using the validated ISAR tool (25), followed by standardized nursing assessment and referral for those screened at high risk and discharged to the community (26).
10. Geriatric Nurse located in the ED to assess older patients and provide education to ED staff (32).
11. Pharmacist in the ED (43).

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