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Transport outcomes and dispatch determinants in a paramedic long-term care program: a pilot study

Jan L. Jensen, ACP, MAHSR*†; Andrew H. Travers, MD, MSc*†‡; Darrell J. Bardua, ACP*; Thomas Dobson, ACP, MPH*; Bruce Cox, ICP, EMD*; Jennifer McVey, MSc, MD*†‡; Ed Cain, MD†‡; Robert Merchant, ACP*; Alix J.E. Carter, MD, MPH*†‡

ABSTRACT

Objectives: Long-term care (LTC) patients are often sent to emergency departments (EDs) by ambulance. In this novel extended care paramedic (ECP) program, specially trained paramedics manage LTC patients on site. The objective of this pilot study was to describe the dispatch and disposition of LTC patients treated by ECPs and emergency paramedics.

Methods: Data were collected from consecutive calls to 15 participating LTC facilities for 3 months. Dispatch determinants, transport rates, and relapse rates were described for LTC patients attended by ECPs or emergency paramedics. ECP involvement in end-of-life care was identified.

Results: Of 238 eligible calls, 140 (59%) were attended by an ECP and 98 (41%) by emergency paramedics. Although the top three determinants were the same in each group, the overall distribution of dispatch determinants and acuity differed. In the ECP cohort, 98 of 140 (70%) were treated and released, 33 of 140 (24%) had ''facilitated transfer'' arranged by an ECP, and 9 of 140 (6%) were immediately transported to the ED by ambulance. In the emergency paramedic cohort, 77 of 98 (79%) were immediately transported to the ED and 21 of 98 (21%) were not transported. In the ECP group, 6 of 98 (6%) patients not transported triggered a 911 call within 48 hours for a related clinical reason, although none of the patients not transported by emergency paramedics relapsed.

Conclusion: ECP involvement in LTC calls was found to reduce transports to the ED with a low rate of relapse. These pilot data generated hypotheses for future study, including determination of appropriate populations for ECP care and analysis of appropriate and safe nontransport.

RÉSUMÉ

Objectif: Les personnes résidant dans des établissements de soins prolongés (SP) sont souvent transportées en ambulance aux services des urgences (SU). Dans le cadre d'un nouveau programme de soins paramédicaux prolongés (SPP), des ambulanciers paramédicaux spécialement formés évaluent, sur place, l'état de résidants d'établissements de SP. L'étude pilote dont il sera question ici visait à faire état de l'aiguillage et du sort de résidants d'établissements de SP, examinés par des ambulanciers spécialisés en SPP ou par des ambulanciers paramédicaux d'urgence.

Méthode: Il y a eu collecte de données à partir d'appels consécutifs, faits dans 15 établissements de SP participants, sur une période de 3 mois. Suivent une description des déterminants de l'aiguillage de résidants d'établissements de SP, examinés par des ambulanciers spécialisés en SPP ou par des ambulanciers paramédicaux d'urgence, ainsi que le calcul des taux de transport et de rechute. Les interventions relatives aux SPP en fin de vie ont également été notées.

Résultats: Sur 238 appels recevables, 140 patients (59 %) ont été examinés par des ambulanciers spécialisés en SPP et 98 patients (41 %), par des ambulanciers paramédicaux d'urgence. Bien que les trois principaux déterminants étaient les mêmes dans chacun des groupes, la répartition générale des déterminants de l'aiguillage et le degré de gravité différaient. Dans la cohorte des ambulanciers spécialisés en SPP, 98 patients sur 140 (70 %) ont été traités puis libérés; 33 patients sur 140 (24 %) ont profité d'une « mutation facilitée », organisée par un ambulancier spécialisé en SPP; et 9 patients sur 140 (6%) ont été transportés immédiatement en ambulance, dans un SU. Dans la cohorte des ambulanciers paramédicaux d'urgence, 77 patients sur 98 (79 %) ont été transportés immédiatement dans un SU; et 21 patients sur 98 (21 %) n'ont pas été transportés. Dans le groupe d'ambulanciers spécialisés en SPP, 6 patients non transportés sur 98 (6%) ont fait un appel d'urgence au cours des 48 heures suivantes pour un problème clinique lié, tandis qu'aucun des patients non transportés par les ambulanciers paramédicaux d'urgence n'a fait de rechute.

Conclusions: Les interventions en SPP dans les établissements de SP se sont soldées par une diminution du nombre

From *Emergency Health Services and †Division of mergency Medical Services, Department of Emergency Medicine, Dalhousie University; ‡Capital District Health Authority, Halifax, NS.

Correspondence to: Dr. Jan L. Jensen, Emergency Health Services and Division of Emergency Medical Services, Dalhousie University, 239 Brownlow Avenue, #300, Dartmouth, NS B3B 2B2; jan.jensen@emci.ca.

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de transports aux SU et un faible taux de rechute. Ces données provenant de l'étude pilote ont donné lieu à la formulation d'hypothèses à vérifier dans de futures études, notamment la détermination des populations appropriées, susceptibles de recevoir des SPP, et l'analyse de la pertinence et de la sûreté du non-transport de patients.

Keywords: long-term care, health services, paramedics

Residents of long-term care (LTC) facilities occasionally access emergency medical services (EMS), which usually results in patient transfer to the emergency department (ED) and may contribute to protracted wait times, ambulance offload delay, and ED overcrowding.[1,2] Optimizing the health care of LTC patients includes reducing the need to transfer patients from the LTC facilities to the ED.[3,4] Transfer to the ED is associated with negative consequences to the patient,[5] including discomfort, disruption of routine, unfamiliar surroundings, missed medications, and the increased risk of infection.[6] On reviewing the needs in our community, it was postulated that a collaborative program between EMS and LTC could be considered in which some aspects of ED care could be brought to the LTC facility. By training advanced care paramedics in extended roles, patients could conceptually be managed on site and not transported or managed more effectively by coordinating the ED care plan of the patient.

The purpose of this pilot study was to describe 1) the dispatch call profile for extended care paramedics (ECPs) versus standard emergency paramedic crews, 2) the ED transport rate for each, and 3) the relapse rate for patients not transported for each group. The number of calls in which ECPs were requested to assist with end-of-life care in LTC facilitiess is also reported. Through this pilot study, we sought to better understand the care delivered to LTC patients in this novel program to inform future research and policy development around the optimal use of the program.

METHODS

This observational pilot study was conducted in Halifax, Nova Scotia. Nova Scotia is served by an integrated provincial EMS system (Emergency Health Services [EHS]) and medical communications centre. In the 2010–2011 fiscal year, EHS responded to 48,764 emergency calls, serving a population of nearly 1 million. In Halifax, which has a population of 400,000, EHS responded to 19,304 emergency calls (personal communication, EHS systems analyst, October 31, 2011). Emergency paramedic crews in Halifax consist of a mix of primary care and advanced care paramedics with a small number of intermediate and critical care paramedics. Seven experienced advanced care paramedics were hired into the new ECP program. These ECPs received additional specialized training in the following "extended care" roles: 1) geriatric assessments and management, 2) end-of-life care, 3) primary wound closure techniques (suturing, tissue adhesive), and 4) point-of-care testing. Medical oversight was provided by a dedicated online medical oversight physician (OLMOP) available to the ECPs and established offline protocols. The ECP program started on February 2, 2011, and was available from 0900h to 2100h 7 days of the week as this matched the highest call volume from the LTC facility in a comparative sampling period prior to implementation. ECPs work alone, responding to LTC facilities in a nontransport capable unit. Prior to the ECP program launch, all calls to LTC facilities were transported to an ED unless the patient or decision maker refused transport. With the introduction of this new program, care could be provided on site.

All calls from the LTC facility were screened by emergency medical dispatchers, and assignment of a determinant and acuity was made using the Advanced Medical Priority Dispatch System (AMPDS) (Table 1).[7] In contrast to emergency paramedics, who were generally dispatched as determined by the AMPDS algorithm, ECPs were dispatched through a variety of mechanisms: 1) emergency medical dispatchers may dispatch the ECP based on a predetermined list of low-acuity dispatch determinants; 2) ECPs may be dispatched as a result of specific request from the LTC facility staff (based on their clinical judgment, for any clinical reason or acuity); 3) emergency paramedics may recognize a LTC call as appropriate for the ECP to manage and may request the ECP after consultation with the OLMOP; 4) the ECP may arrange a follow-up visit; and 5) the ECP may be added to a call as an extra resource after emergency paramedics were already assigned. The predetermined dispatch list was derived by expert consensus during design of the ECP program. The list included the following determinants, all at the

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Table 1. Definitions of dispatch levels

	Response unit	Response mode
Omega	Closest ambulance/ECP as appropriate	Cold
Alpha	Closest ambulance/ECP as appropriate	Cold
Bravo	Closest ambulance	Hot
Charlie	Closest ambulance	Hot
Delta	Closest ambulance	Hot
Echo	Closest ambulance	Hot

ECP = extended care paramedic.
In the Advanced Medical Priority Dispatch System, the dispatch levels are generated through computerized call-taking protocols and loosely increase with the severity of the situation and the resources required. The levels indicate the type of unit to be dispatched and their response mode (lights and sirens [hot] or no lights and sirens [cold]).[18]

Alpha acuity level, unless noted in brackets: abdominal pain, allergies, assault, back pain, choking, diabetic problem, eye injuries, falls, headache, hemorrhage/lacerations, poisoning (Omega), sick person (Alpha and Omega), and traumatic injuries. Emergency paramedics were dispatched to all calls received off-hours (2100h–0900h) regardless of dispatch determinant as they had been before the program launch.

When emergency paramedics attended to an LTC patient, both before and after the introduction of the ECP program, disposition could only be immediate transport to the ED unless the patient or substitute decision maker refused transport after the paramedics' assessment or for a very limited number of conditions (e.g., hypoglycemia treated at the scene). When an ECP attended the patient, disposition could include treat and release, facilitated ED transfer, and immediate transport to the ED by emergency paramedics. In all cases when feasible, the ECP was required to consult with the OLMOP and the LTC physicians. The disposition decision was made on a case-by-case basis based on the patient's wishes, the clinical situation, treatment options on site, and likely treatment in the ED. In the treat-and-release subset of patients, patient care needs could be addressed by the ECP (e.g., wound suturing, international normalized ratio [INR] check, end-of-life care, etc.), including arranging a follow-up visit with either the LTC physician or the ECP. In the facilitated ED transport subset, the OLMOP, after consultation with the ECP, could develop a coordinated care plan with the local ED, taking into account the availability of diagnostics and consultations, crowding, and the urgency of the complaint. For example, a patient with a sore ankle after a fall could have splinting and pain relief provided on site and arrangements made for a facilitated ED visit the following morning for imaging if necessary. In the immediate transport subset, the ECP could request that emergency paramedics transport the patient to hospital.

Data from EHS dispatch and patient care record databases were collected for all ECP and emergency paramedic calls that occurred at 15 participating LTC facilities during the 3-month study period (03/15/2011–06/15/2011). The timing of the study period allowed for a 6-week run-in from the program launch date. Case selection included ECP follow-up calls but excluded scheduled transfers. Calls from assisted living locations, for LTC staff and for other people who were not LTC residents, were excluded. Data elements collected were dispatch determinants and acuity levels; if the ECP was involved in the call; how the ECP was requested; if the dispatch determinant was on the predetermined ECP dispatch list; paramedic working diagnosis; if there was documentation of advanced directives or a "do not resuscitate" order; if the call concerned an end-of-life case; and call disposition. Data were obtained through a database query, and chart reviews were collected by trained paramedic research assistants. Data were entered into *Excel* (Microsoft Corp., Redmond, WA) and were analyzed in *SPSS* 17.0 (IBM, Armonk, NY). Descriptive statistics were used to characterize the above-listed data elements. Differences in the distribution of dispatch determinants and dispatch acuity between the ECP and emergency paramedic calls were assessed with the Pearson chi-square test. The database was searched for repeat encounters within 48 hours for every patient who was not transported by either ECPs or emergency paramedics. EMS charts of both the initial and repeat call(s) were assessed by the study team; "relapse" was determined with team consensus. A relapse was defined as any unexpected repeat calls to EHS (excluding arranged follow-up visits with the ECP) within 48 hours for a clinical reason related to the clinical presentation of the nontransported case. Research Ethics Board approval was received from the Capital District Health Authority Research Ethics Board (2011-309).

RESULTS

We initially identified 265 calls in the database; 26 were excluded because they occurred in assisted living units and 1 was excluded because the patient was a LTC facility employee, leaving 238 calls for analysis (Figure 1).

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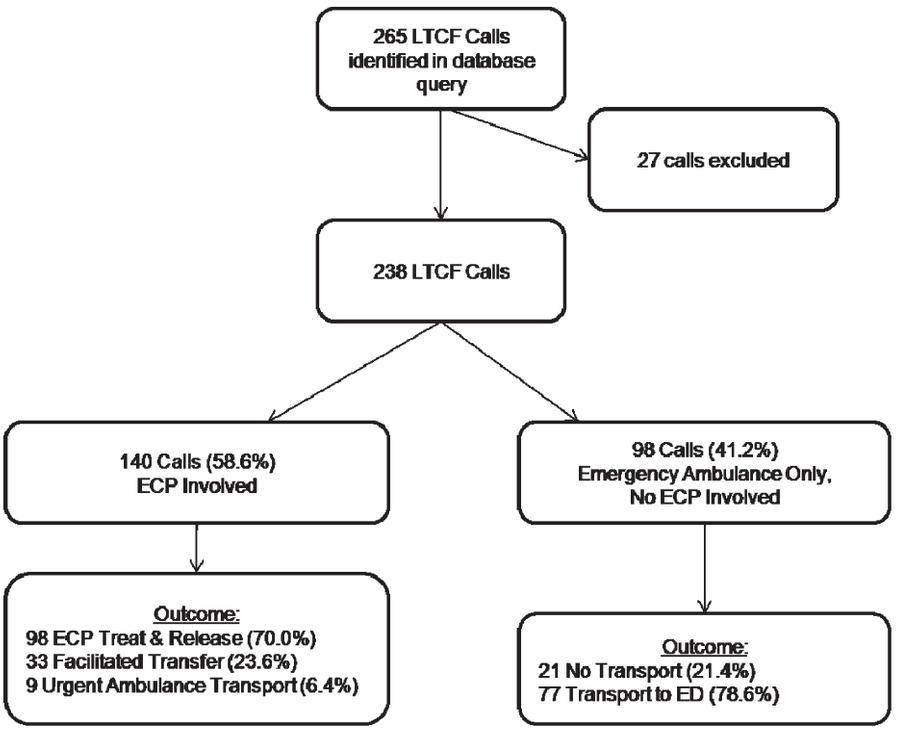

Figure 1. Long-term care facility (LTCF) calls included in the sample. ECP = extended care paramedic; ED = emergency department.

The top three most common dispatch determinant problems were the same for both ECP and emergency paramedic calls: sick person, falls, and breathing problems (Table 2).[7] However, the overall distribution of dispatch problems and acuities was found to be different between the ECP and emergency paramedic groups (both $p = 0.03$) (see Table 2 and Table 3).

ECPs were most often dispatched to calls as a result of a specific request for their services from the LTC

Table 2. Dispatch determinant problems for ECP and emergency paramedic LTCF calls

Problem	ECP, *n* (%) (*n* = 140)	Emergency paramedic, *n* (%) (*n* = 98)
Sick person	51 (36.4)	29 (29.6)
Falls	29 (20.7)	18 (18.4)
Booked ECP follow-up	19 (13.6)	0
Breathing problems	18 (12.9)	12 (12.2)
Abdominal pain/problems	6 (4.3)	3 (3.1)
Hemorrhage/lacerations	4 (2.9)	4 (4.1)
Traumatic injuries	3 (2.1)	1 (1.0)
Unconsciousness/fainting	3 (2.1)	6 (6.1)
Diabetic problems	2 (1.4)	2 (2.0)
Psychiatric/abnormal behaviour/suicide attempt	2 (1.4)	4 (4.1)
Chest pain	1 (0.1)	7 (7.1)
Convulsions/seizures	1 (0.1)	3 (3.1)
Stroke	1 (0.1)	2 (2.0)
Back pain	0	2 (2.0)
Cardiac/respiratory arrest	0	2 (2.0)
Heart problems	0	3 (3.1)

ECP = extended care paramedic; LTCF = long-term care facility.

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Table 3. Dispatch acuity levels of ECP and emergency paramedic LTCF calls

Acuity level	ECP, *n* (%) (*n* = 140)*	Emergency paramedics, *n* (%) (*n* = 98)
Omega	4 (33.1)	5 (5.1)
Alpha	62 (51.2)	31 (31.6)
Bravo	12 (9.9)	10 (10.2)
Charlie	19 (15.7)	16 (16.3)
Delta	24 (19.8)	34 (34.7)
Echo	0	2 (2.0)

ECP = extended care paramedic; LTCF = long-term care facility.
*Nineteen ECP follow-up calls were not assigned an acuity level.

facility, followed by ECPs arranging a follow-up visit (Table 4). In only 12% of cases were ECPs sent on a call as a result of dispatchers identifying the call as suitable for the ECP based on the predetermined dispatch determinant list. Of the ECP calls, 89 (63.4%) had determinants that do not appear on the ECP dispatch list (Table 5). The most frequent ECP calls that were not on the dispatch list were breathing problems (Delta), sick person (Charlie), and ECP follow-up and falls (Bravo). The most common dispatch problems from the predetermined list that ECPs attended were sick person (Alpha) and falls (Alpha).

LTC patients treated by ECPs remained at the LTC facility in 98 of 140 (70%) cases, compared to 21 of 98 (21.4%) of emergency paramedic calls (see Figure 1). All six patients (five sick person, one fall; one Omega, two Charlie, and three Delta) who were not transported but subsequently triggered a 911 call within 48 hours for a medical condition related to the original call were in the ECP cohort. The ECP patient care reports were examined for evidence of an advanced directive and/or a do not resuscitate order, which was found in 85 (60.7%). Eleven of these ECP cases (three breathing problems, five sick person, three ECP follow-up call) were considered end of life.

DISCUSSION

LTC residents are a vulnerable patient population. They often suffer from dementia and/or complex medical conditions[8] and may not be able to communicate their wishes for care. The motivation to develop the ECP program was to decrease the discomfort, disorientation, and disrespect of patient wishes that result from avoidable ED transports. During this study, we observed a decreased transport rate with the ECP program. Several other interesting findings came to light.

In this program, ECPs were assigned to calls differently than emergency paramedics were. We identified that the predetermined ECP dispatch list was not predictive of the calls that ECPs attended. Most ECPs were assigned to calls as a result of LTC facility staff specifically requesting their services. This is consistent with a previously published study illustrating the challenges in seeking expert consensus on a list of dispatch determinants for which it was best not to send an ambulance or to delay EMS response.[9] The author concluded that the list must be validated against real-world data to determine its utility. Although triage and ambulance assignment by emergency medical dispatchers using the AMPDS is fairly sophisticated, it may be a less valuable tool to dispatch

Table 4. Method of ECP unit request

Method	*n* (%)
LTC staff called and specifically requested ECP	84 (60.0)
Arranged as ECP follow-up*	25 (17.9)
EMD sent ECP based on ECP dispatch list	17 (12.1)
ECP sent as extra resource after emergency paramedics dispatched	10 (7.1)
Emergency paramedics requested ECP	4 (2.9)

ECP = extended care paramedic; EMD = emergency medical dispatcher; LTC = long-term care.
*Six ECP follow-up calls were assigned a dispatch determinant.

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Table 5. ECP calls that were not on the predetermined list (n = 89)

Dispatch problem	Acuity	*n* (%)
Sick person (*n* = 23)	Alpha	7 (7.8)
	Charlie	10 (11.2)
ECP follow-up calls (*n* = 19)	—	19 (21.3)
Breathing problems (*n* = 18)	Charlie	6 (6.7)
	Delta	13 (14.6)
Falls (*n* = 15)	Alpha	6 (6.7)
	Bravo	9 (10.1)
Unconscious/fainting (*n* = 3)	Alpha	2 (1.2)
	Delta	1 (1.1)
Hemorrhage/lacerations (*n* = 2)	Bravo	1 (1.1)
	Delta	1 (1.1)
Psychiatric/abnormal behaviour/suicide attempt (*n* = 2)	Bravo	2 (2.2)
Stroke (*n* = 1)	Charlie	1 (1.1)
Chest pain (*n* = 1)	Delta	1 (1.1)
Convulsions/seizures (*n* = 1)	Delta	1 (1.1)
Diabetic problems (*n* = 1)	Delta	1 (1.1)

ECP = extended care paramedic.

expanded-scope paramedics.[10] Gray and Walker suggested that it may be best to use other screening criteria to select the most appropriate calls for ECPs or send them to all LTC calls, as well as send an emergency ambulance for high-acuity calls. For example, in our study population, this would have resulted in emergency paramedics being sent lights and sirens to those breathing problem (Delta) calls that were really end-of-life situations, suggesting the need for further refinement of both dispatch criteria and the role of EMS in end-of-life care.

The emergency paramedic nontransport rate was significantly higher than expected. Nontransport by paramedic crews from LTC emergency calls have traditionally been very infrequent in our system. EHS has treat-and-release protocols only for specific clinical conditions (e.g., hypoglycemic patients).[11] The high emergency paramedic nontransport rate may have been due to several factors: emergency paramedics taking the initiative to treat and offer no transport as a result of being aware of such an option existing within the ECP program; changing expectations of LTC facility staff, patients, and family based on the ECP program; and ECPs working a shift on an emergency unit (not on the ECP unit) and finding it hard to "take their ECP hat off" when not officially working in that role.

A paramount consideration in a program such as this is patient safety. We identified all patients who had an unexpected repeat emergency call to EHS for a related reason within 48 hours of the original nontransport call. This time period was chosen because it was believed that if the acute complaint was a result of the condition that caused the initial call, the problem would make itself apparent within this time; this period has also been used in other studies.[12] A 6% rate of repeat emergency calls is close to published relapse rates for patients discharged from the ED.[13,14] Although none of the patients not transported by emergency paramedics had a repeat emergency call within 48 hours, the number of nontransports was small, and the cohorts were different at baseline, so one should not conclude that emergency paramedic nontransport is safer than ECP nontransport. Also, one must consider the complexity of this population. In one relapse case, a patient was considered an end-of-life case and the decision was made to provide comfort care in the LTC facility. The patient's family subsequently requested emergency ambulance transport a few hours later. In another case, the ECP treated a patient with low blood pressure and lethargy with a fluid bolus and cleared the scene after the patient improved. An emergency call was placed the next day that the ECP attended, and a decision was made to institute comfort care only at the LTC facility. Thus, not all repeat emergency calls represent an inappropriate disposition decision on the first call. In selected cases, a shorter interval to reassessment by either the ECP or the LTC physician

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could help ensure that care needs are met and reduce unexpected repeat emergency services activation.

One of the particularly novel situations encountered by the ECPs was their involvement in end-of-life cases. This type of care is new for paramedics and directly contradicts traditional paramedic training and response, which is to resuscitate and transport in almost all circumstances. As the population ages, end-of-life care will likely become a clinical area that paramedics will encounter more often, and they may be able to provide a much-needed resource. End-of-life is not limited to those patients in a palliative care program, but rather all patients in the dying process. Care is focused on facilitating a high quality of death.[15] End-of-life care in LTC facilities has been identified as needing improvement.[16] Burge and colleagues found an inverse correlation between the amount of family physician involvement in end-of-life cancer care and the number of ED visits.[17] The ECP program may help meet this need, provide symptom relief, and avoid unnecessary and unwanted transport to hospital.[3] This area requires further study.

This study has limitations that are inherent in uncontrolled, observational studies. Several uncontrolled variables were likely at play; as such, one must use caution when comparing the two groups in our study. The main limitation in comparing the two groups was the fundamental differences in how calls were assigned to ECP and emergency crews, as a result of which, the patients in the two groups were not identical. Many of the ECP calls resulted from LTC facility staff specifically requesting them. In addition, in 34 ECP calls, dispatchers assigned the call the "nursing home request" dispatch determinant. A communications supervisor reviewed all the notes and, in some cases, the audio recording for these calls and retrospectively assigned the dispatch protocol the call would have been if "nursing home request" was not available. This was done so that these calls could be included in our analysis in a meaningful way.

CONCLUSION

We describe a novel program introducing ECP care into LTC facilities. ECP involvement in LTC calls was found to reduce transports to the ED, with a low overall relapse back to the EMS system. These data will provide the platform for much-needed research that will inform the dispatch, operational, and clinical policies of extended/community paramedic programs.

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REFERENCES

1. Karim S, Carter AJE, Ferguson J, et al. The evolution of offload delay over a six year period in a provincial EMS system [abstract]. *Prehosp Emerg Care* 2009;13:91.
2. Eckstein M, Chan LS. The effect of emergency department crowding on paramedic ambulance availability. *Ann Emerg Med* 2004;43:100-5, doi:10.1016/S0196-0644(03)00747-9.
3. Clarke B, Pyra K. *From care by default to care by design: improving primary care of the elderly in Capital Health. Report of Capital Health's Primary Care of the Elderly Project.* 2006. Halifax Nova Scotia.
4. Saliba D, Kington R, Buchanan J, et al. Appropriateness of the decision to transfer nursing facility residents to the hospital. *J Am Geriatr Soc* 2000;48:154-63.
5. Ackroyd-Stolarz S, Read Guernsey J, Mackinnon NJ, Kovacs G. The association between a prolonged stay in the emergency department and adverse events in older patients admitted to hospital: a retrospective cohort study. *Qual Saf Health Care* 2011;20:564-9, doi:10.1136/bmjqs.2009.034926.
6. Quach C, McArthur M, McGeer A, et al. Risk of infection following a visit to the emergency department: a cohort study. *CMAJ* 2012;184:e232-9, doi:10.1503/cmaj.110372.
7. National Academies of Emergency Dispatch. Resources. Available at: http://www.emergencydispatch.org/ResourcesEDS (accessed October 27, 2011).
8. Rovner BW, German PS, Broadhead J, et al. The prevalence and management of dementia and other psychiatric disorders in nursing homes. *Int Psychogeriatr* 1990;2:13-24, doi:10.1017/S1041610290000266.
9. Woollard M. Emergency calls not requiring an urgent ambulance response: expert consensus. *Prehosp Emerg Care* 2003;7:384-91, doi:10.1080/10903120390936626.
10. Gray JT, Walker A. AMPDS categories: are they an appropriate method to select cases for extended role ambulance practitioners? *Emerg Med J* 2008;25:601-3, doi:10.1136/emj.2007.056184.
11. Emergency Health Services. *Medical policy, procedure & protocol manual.* 2009. Available at: http://www.gov.ns.ca/health/ehs/Medical_Director/P&P%20Manual%20Acrobat/Protocols%20Master.pdf (accessed October 27, 2011).

12. Arendts G, Sim M, Johnston S, et al. ParaMED home: a protocol for a randomised controlled trial of paramedic assessment and referral to access medical care at home. *BMC Emerg Med* 2011;11:7, doi:10.1186/1471-227X-11-7.
13. Wu CL, Wang FT, Chiang YC, et al. Unplanned emergency department revisits within 72 hours to a secondary teaching referral hospital in Taiwan. *J Emerg Med* 2010;38:512-7, doi:10.1016/j.jemermed.2008.03.039.
14. Foran A, Wuerth-Sarvis B, Milne WK. Bounce-back visits in a rural emergency department. *Can J Rural Med* 2010;15:108-12.
15. Economist Intelligence Unit. *The quality of death. Ranking end-of-life care across the world.* 2010. Available at: http://www.lifebeforedeath.com/pdf/Quality_of_Death_Index_Report.pdf (accessed October 27, 2011).
16. Oliver DP, Porock D, Zweig S. End-of-life care in U.S. nursing homes: a review of the evidence. *J Am Med Dir Assoc* 2004;5:147-55, doi:10.1016/S1525-8610(04)70107-3.
17. Burge F, Lawson B, Johnston G. Family physician continuity of care and emergency department use in end-of-life cancer care. *Med Care* 2003;41:992-1001, doi:10.1097/00005650-200308000-00012.
18. Clawson JJ, Boyd Dernocoeur K, Rose B. *Prinicples of emergency medical dispatch*. 4th edition, version 12.0. Salt Lake City (UT): Priority Press.

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