Impact of acute geriatric services for nursing home residents on emergency department presentation and hospitalisation

ORIGINAL ARTICLE

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ABSTRACT

Background. Prior to May 2015, our hospital provided only non-urgent geriatric services for nursing home residents. Thereafter, the Connecting Care Programme was introduced to provide acute geriatric services, including administration of intravenous antibiotics and fluids and a variety of other procedures. This audit aimed to investigate the impact of acute geriatric services for nursing home residents on emergency department presentation and hospitalisation.

Methods. Medical records of nursing home residents who presented to the Bankstown-Lidcombe Hospital before (from May to August 2014) and after (from May to August 2015) the Connecting Care Programme were retrospectively reviewed. The two groups were compared in terms of emergency department presentation and discharge rates.

Results. Respectively for the group before and after the programme, of all presentations to the emergency department, 276 and 318 involved nursing home residents (6.1% vs 7.1%, p=0.056). Of these, 106 and 167 were discharged from the emergency department (38.4% vs 52.5%, odds ratio=1.76, 95% confidence interval=1.2-2.4, p=0.0008). The Connecting Care Programme increased the discharge rate in those with a diagnosis of fall without fracture (70% vs 88%, p=0.021), respiratory (11% vs 31%, p=0.020), gastrointestinal (34% vs 50%, p=0.025), or cardiovascular (24% vs 60%, p=0.010) complaints.

Conclusion. The Connecting Care Programme resulted in an increased discharge rate and decreased hospital admission rate for nursing home residents who presented with fall without fracture, respiratory, gastrointestinal, or cardiovascular complaints. The programme may enable better utilisation of healthcare resources.

Key words: Emergency service, hospital; Health services for the aged

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INTRODUCTION

In Australia in 2015, about 270,559 people aged ≥65 years were residents of residential care facility, and most of whom required high-level care.[1] They are usually frail with multiple chronic diseases and have dementia.[2] They frequently present to the emergency department and need hospitalisation.[3] However, most of such presentations and subsequent

hospitalisations can be avoided,[4] especially if alternative specialist care is available.[5,6]

The Hospital in the Home Programme aims to prevent or substitute in-hospital care. It provides personal and clinical support and management of medical conditions, usually for medically stable patients who do not require a high level of clinical support.[7] The care setting is usually the patient's own home or residential care facility.[8] The programme provides a safe alternative for selected patients who require acute hospital-level care.[9,10] The care cost of the programme is less than half of that of inpatient care,[11] and yet provides better patient and carer satisfaction.[12-14]

Since May 2015, the Bankstown-Lidcombe Hospital has introduced the Connecting Care Programme. We evaluated the programme's source of referral and immediate patient outcome, the impact on emergency department presentation, and the discharge rate from the emergency department (hospital admission avoidance).

METHODS

This study was approved by the Research and Ethics Committee at the South Western Sydney Local Health District Office in 2015 (LNR/15/LPOOL/415). The Bankstown-Lidcombe Hospital is a principal referral hospital, with tertiary affiliations with the University of New South Wales, University of Sydney, and Western Sydney University. It has 454 beds and serves a population of 195,481.[15,16] Its emergency department handles over 50,000 patients per year.[17]

Prior to May 2015, the hospital provided only non-urgent services for referrals from 16 nursing homes. Typical referrals were for management of behavioural and psychological symptoms of dementia, comprehensive geriatric assessment, and follow-up for certain complicated hospital discharges.

Since May 2015, in addition to non-urgent referral services, the hospital has provided acute geriatric services for urgent medical conditions (**Table 1**), except for emergency resuscitation and blood transfusion. Two consultant geriatricians share one full-time equivalent job, and a community nurse provides assistance to administer intravenous/subcutaneous therapy. The Connecting Care Programme operates only during business hours (8:30 to 17:00), not in the evening or at weekends. The geriatricians can review the nursing home residents within 2 to 4 hours of referral, except when consent from patients and/or family is lacking.

Table 1
Services provided by the Connecting Care Programme

Services provided by the Connecting Care Programme
Immediate and direct clinical review
Intravenous antibiotics
Intravenous and subcutaneous fluids
Bladder catheterisation
Delirium diagnosis and management
Anticoagulation
Fall prevention and management
Gastroenteritis outbreak management
Referral for radiology
Blood collection for the purpose of diagnosing acute illness
Acute pain management
Management of behavioural and psychological symptoms of dementia (also provided previously)
End of life care
Staff education and training

Referrals were made to the geriatricians by direct phone calls from general practitioners, nursing home, and emergency department staff. Rarely, referrals also come from an inpatient medical team to facilitate early discharge. The geriatricians attend the emergency department every morning to identify patients who do not require admission and transfer them to the Connecting Care Programme. These patients will be discharged and then treated in the nursing home by a consultant geriatrician with follow up by a general practitioner. The programme does not offer post-emergency follow-up.

We compared the first 4 months (May to August 2015) of the programme with the same 4 months in 2014 to avoid possible seasonal variation in the emergency presentations. There were no other acute nursing home services or programmes at the same time in the Bankstown-Lidcombe Hospital. Activity of the programme was obtained from the geriatricians. Medical records of patients aged 65 years

and older who presented during the study periods was obtained from the Emergency Department Data Manager, and those for nursing home residents were selected. Data from the emergency department were crosschecked with Connecting Care activity records.

Emergency department discharge diagnoses were classified as behavioural and psychological symptoms of dementia, respiratory illness, end-of-life care, urinary problem, cardiac illness, cerebrovascular/seizure, fall with fracture, fall without fracture, cellulitis, dehydration, gastrointestinal illness, or other miscellaneous diagnoses included non-traumatic exacerbation of chronic pain, hyponatraemia, anticoagulation management, hyperglycaemia, and unwell with non-specific symptoms.

A patient was considered 'admitted' to the hospital when an in-patient hospital bed was needed, and considered 'discharged' when an in-patient bed was not needed. For the purpose of this study, a patient who died in the emergency department was considered to have been 'admitted'. Emergency department presentation and discharge rates were calculated. Reasons for not returning to the nursing home after presentation to the emergency department were not examined.

The two groups were compared using the Student's *t* test for continuous variables or the Pearson Chi-square test for categorical variables. All p values were two-sided, and a p value of <0.05 was considered statistically significant. No adjustment for multiple statistical testing was made.

RESULTS

Of the 175 cases referred to the Connecting Care Programme over the first 4 months (May to August 2015), 34% were from general practitioners, 33% from nursing homes, 26% from the emergency department, and 7% from in-patient wards. Of these, two were transferred to the emergency department for further management.

Respectively for the group before and after the programme, 4520 and 4475 presentations to the emergency department were by patients aged ≥65 years. Of these, 276 and 318 involved nursing home residents (6.1% vs 7.1%, p=0.056, **Table 2**). Of these, 106 and 167 were discharged from the emergency department (38.4% vs 52.5%, odds ratio=1.76, 95% confidence interval=1.2-2.4, p=0.0008). Of the 167 nursing home residents discharged, 46 were assisted by the Connecting Care Programme.

The Connecting Care Programme increased the discharge rate in those with a diagnosis of fall without fracture (70% vs 88%, p=0.021), respiratory (11% vs 31%, p=0.020), gastrointestinal (34% vs 50%, p=0.025), or cardiovascular (24% vs 60%, p=0.010) complaints (**Table 2**).

DISCUSSION

Referral

The Connecting Care Programme reduced the number of hospital admissions but not emergency presentations. Of 175 cases referred to the programme, 26% were by the emergency department and 74% were by general practitioners, nursing homes, or in-patient wards. The programme did not appear to have an impact on either emergency presentation or admission. The geriatricians in the programme also handle non-acute referrals. Some referrals were not strictly hospital avoidance, for example patients with behavioural and psychological symptoms of dementia. If a better referral pathway and triage system were in place and the programme could focus on acute referrals only, the results might have been different. Two of 175 patients were transferred to the emergency department for further care: one deteriorated beyond the capacity of the programme and another withdrew consent to be treated by the programme.

Emergency presentation and hospitalisation

Over the first 4 months of the programme, the percentage of emergency presentations by nursing home residents did not decrease. This may be because the programme operated only during business hours (8:30 to 17:00) and not at the weekend. The programme was new to the nearby nursing homes and was not widely publicised to the primary care services in the community. Health practitioners and nursing home residents and their families may lack confidence in the programme. Other likely factors associated with slow uptake of the programme include inadequate care planning, lack of advanced care planning,[18] legal concerns,[19] bureaucracy and conflicting stakeholder preferences.[20,21] Nonetheless, the programme resulted in more nursing home

Table 2
Discharge rates of nursing home residents from the emergency department before and after the Connecting Care Programme

Variable	May to August 2014	May to August 2015	p Value	May to August 2014 (n=276)	May to August 2015 (n=318)	p Value
No. of presentations to emergency department by patients aged ≥65 years	4520	4475	-	-	-	-
No. (%) of presentations to emergency department by nursing home residents	276 (6.1)	318 (7.1)	0.056	-	-	-
No. (%) of nursing home residents discharged from emergency department	-	-	-	106 (38.4)	167 (52.5)	0.0008
Mean±SD age, y	85.6±7.4	84.0±8.6	-	-	-	-
Male:female ratio	1:1.22	1:1.19	-	-	-	-
No. (%) of discharges in those with a diagnosis of						
Fall without fracture	50 (18)	58 (18)	0.969	35 (70)	51 (88)	0.021
Respiratory	45 (16)	45 (14)	0.465	5 (11)	14 (31)	0.020
Urinary/renal	37 (13)	54 (17)	0.228	11 (30)	25 (46)	0.112
Gastrointestinal	32 (12)	34 (11)	0.727	11 (34)	17 (50)	0.025
Cardiovascular	25 (9)	25 (8)	0.600	6 (24)	15 (60)	0.010
Behavioural and psychological symptoms of dementia	21 (8)	17 (5)	0.261	8 (38)	5 (30)	0.574
Cellulitis	13 (5)	9 (3)	0.226	5 (38)	6 (66)	0.193
Fall with fracture	9 (3)	17 (5)	0.215	3 (33)	2 (12)	0.184
Stroke	7 (3)	10 (3)	0.657	2 (29)	3 (30)	0.949
Palliative	0 (0)	4 (1)	0.062	0	4 (100)	1
Others	37 (13)	45 (14)	0.793	20 (54)	25 (56)	0.891

residents being discharged from the emergency department. Nursing home residents were 76% more likely to be discharged back to the nursing home, particularly those with a diagnosis of fall without fracture, respiratory, gastrointestinal, or cardiovascular complaints.

In a study in Austria, on-demand visits by geriatricians to nursing homes resulted in fewer hospitalisations (6.1 vs 11.7 per 100 residents, $p<0.01$).[5] In another study, provision of a combined specialist nurse and physician service for nursing homes also resulted in fewer hospitalisations.[6] In a Queensland study, the Hospital in the Home Programme resulted in significantly fewer emergency presentations (a rate ratio of 0.78 per 1000 nursing home beds) and hospitalisations (a rate ratio of 0.62 per 1000 nursing home beds), despite the programme not being exclusive to a consultant geriatrician.[22] In addition, a programme to enhance primary care has shown a 17% reduction in emergency presentations ($p<0.001$)[23] and significant cost reduction in care provision.[24] However, some studies have reported no or a non-significant reduction in emergency presentations or hospitalisations.[25-27]

Our study involved only a single centre and did not evaluate nursing home residents who were referred to the ambulatory care unit for intravenous therapy or were admitted directly to a hospital ward. The aspects of bypassing emergency department were not studied. Nonetheless, these services were available in both 2014 and 2015. Furthermore, our study covered only 4 months. If the study was extended to an entire year, better seasonal representation of the impact of the Connecting Care Programme could be established to evaluate the need of the programme in less busy seasons such as spring or summer.

Mortality and morbidity

In a meta-analysis, treating nursing home residents in their familiar environment reduced mortality by 19%, compared with hospital-based treatment.[28] It

is therefore a safe alternative for selected patients who require acute hospital-level care.[10] In a randomised controlled trial of the Hospital in the Home Programme, home treatment reduced the incidence of delirium by 20%, bowel complications by 22.5%, and bladder complications by 14%.[29] In another study, the incidence of delirium was much lower in elderly people treated in their home rather than hospital (9% vs 24%).[30] Furthermore, the use of antipsychotics is significantly lower if patients are treated in their own home.[12]

Similar programme in other hospitals

There are different types of programmes for nursing home residents in different hospitals.[9] In the Sydney South-East area, the Geriatric Flying Squad has extended its hours of services to include evenings and weekends. Referrals can be seen by a specialist geriatrician or a nurse practitioner. Conditions managed by the Geriatric Flying Squad are delirium, cellulitis, urinary tract infection, anticoagulation, end-of-life care, disease outbreak management (usually gastroenteritis), and acute pain management.[31] In the Northern Hospital in Victoria, the Residential Care Intervention Programme for The Elderly (RECIPE) includes a geriatrician, geriatric trainee, and nursing staff with access to a full team of allied health practitioners.[10] Both of these services are based on hospital avoidance / replacement care model. In contrast, the War Memorial Hospital provides assessment for functionally declining patients with a multidisciplinary approach to avoid emergency presentation and hospitalisation, but it does not provide acute medical treatment.[32]

Our Connecting Care Programme was operated by two part-time geriatricians with assistance from a community nurse, with no help from nursing or allied health staff. The community nurse assists in administration of intravenous fluids and medications. Currently, there is no triage system or referral pathway, and the geriatricians are the only point of contact. Upon seeing patients in the emergency department, the consultant geriatrician decides the appropriate management and suitability of the patient for discharge to the nursing home for treatment. This can potentially speed up the discharge process. The geriatrician can assess, diagnose, and formulate a management plan for complex and multifactorial geriatric syndromes.[33] In the case of palliative care support, the geriatrician can diagnose and treat comorbidities accordingly, rather than just administer palliative medications. The ability to prescribe medications to manage end-of-life care enables higher efficiency and hence is cost saving. In Australia, nurse practitioners can prescribe medications within their area of expertise. The prescribing authority is conferred under the legislation of the state in which they practice.[34] Although nurse practitioners can make clinically appropriate prescribing decisions, the cost of drugs prescribed by them is higher, and their assessment and diagnostic skills are lacking and they order more investigations than doctors.[35] Each general practitioner provides palliative care to approximately 5 to 7 patients annually.[36-38] Some general practitioners feel uncomfortable when confronting terminally ill patients.[37] The palliative care training that they have received is insufficient.[38-40] Time is one of the major constraints in the provision of adequate care to dying patients.[38] Additional help to provide patients with palliative care is needed.

CONCLUSION

The Connecting Care Programme resulted in an increased discharge rate and decreased hospital admission rate for nursing home residents who presented with fall without fracture, respiratory, gastrointestinal, or cardiovascular complaints. The programme may enable better utilisation of healthcare resources.

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DECLARATION

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