

A service model of short-term case management for elderly people at risk of hospital admission

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Abstract

This article presents the model of a short-term case management program focused on reducing emergency department presentations and unplanned hospital admissions for a targeted group of older people with complex care needs. As a semi-integrated health care program, Treatment Response and Assessment for Aged Care (TRAAC) is implemented by short-term case managers located in a variety of community agencies as well as acute and sub-acute hospital settings. The article discusses the features of the model including case finding, early intervention and risk screening, combined with the rapid mobilisation of specialised geriatric assessment services. The model has the potential to contribute to positive results in managing the complex health needs of this group. Evaluation outcomes including reductions in hospital use for the target group, and positive client and staff perceptions of the service model are discussed in relation to the unique features of the intervention program.

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What is known about the topic?

The boundary between hospital and community care has changed over the last decade with a number of clinical, pharmaceutical and social service needs now safely managed in the community. Some emergency presentations can be prevented with the provision of alternative models of care and support.

What does this paper add?

This article discusses a short-term case management model that is semi-integrated across acute and community services, for aged persons at risk of a hospital presentation. Evaluation has indicated some success in reducing hospital usage for this cohort. Staff and clients perceive the model positively.

What are the implications?

This model has indicated some positive outcomes. Development and evaluation of a fully integrated model is the next step, but this must be supported by the broader health system.

CASE MANAGEMENT AS A MEANS of meeting the needs of older people with chronic health problems and complex needs has had a long history of practice.¹ The holistic, “client-centred” focus of case management intervention is well suited to the needs of chronically ill older people who need highly skilled geriatric assessment and care planning, effective advocacy and intensive assistance with the coordination of a complex array of services. The skills of the case manager are particularly called on to reach out to “hard to engage” unwell clients, whose avoidance of services may place them at additional risk of serious health breakdown. The role of the case manager to integrate care, monitor goals and evaluate outcomes over a defined time period has been evident in a range of settings, including the acute and the community sectors.¹

However, research literature indicating the efficacy of case management to achieve predicted

I Evaluation methods

Program objective

Evaluation method

Reduction of avoidable emergency department presentations and hospital admissions for the client group, at St Vincent's Health Melbourne.

"Before/after" design was used to measure:

- Total emergency department presentations
- Total elective acute hospital admissions
- Total acute bed-days used

A count of emergency presentations and admissions to the acute care hospital for recruited Treatment Response and Assessment for Aged Care (TRAAC) clients was provided up until June 30, 2005. The data for the client cohort compared a selected period from the initial recruitment date with the same number of days in the period before recruitment, ie, the equivalent pre/post recruitment time.

Cohorts were reviewed at 3 months, 6 months and 12 month intervals in a selected period. The data included clients with "emergency" and "acute" admission type codes regardless of diagnosis.

The data excluded clients with incomplete electronic data and clients who had died. The difference in mean pre/post totals was examined using a Wilcoxon rank sum test. P values less than 0.05 were considered statistically significant.

To provide a service that is acceptable to patients and carers and assists them to meet their needs.

A short survey was developed and sent to clients over a 2-month period following their discharge from the program.

Respondents were asked to rate characteristics of the program using a scale of "strongly agree" to "strongly disagree"; there was also the opportunity for extended response.

Percentage scores for response to each question were calculated and thematic analysis was undertaken for open questions.

To understand staff perceptions of progress with the current approach to service delivery and service integration.

A staff survey focusing on staff perceptions of service delivery and integration across health services was developed in collaboration with the Centre for Development and Innovation in Health at the Australian Institute for Primary Care (AIPC).

Key themes for the survey were developed from focus groups with independent analysis of the results undertaken by AIPC.

The survey was administered in December 2004 to staff from three of the established Hospital Admission Risk Program services at St Vincent's Health that fund staff in local agencies in acute care and community settings (TRAAC was one of these services).

Respondents were asked to rate scales to reflect their response to a range of questions throughout the survey and mean scores were calculated. There was also the opportunity for extended response which was analysed thematically. Independent analysis was undertaken by AIPC.

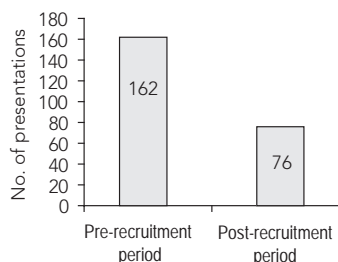
outcomes for those who have been "case managed" is a relatively recent phenomenon. In the past, the expected outcomes of case management, as practised by a range of disciplines, notably social work and nursing, related to better service navigation and measures of improvement in individual health and wellbeing. Recently, case management has been the intervention of choice for programs seeking health improvements and a

reduction in the use of expensive hospital inpatient resources.

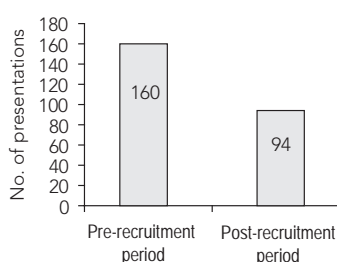
The literature on multiple hospital admissions for older people reveals that different but related approaches have been implemented to reduce preventable hospital care for this cohort. These range from involvement of a single clinic nurse to facilitate discharge planning, readmission risk assessment, service coordination and clinic fol-

2 Total presentations to the emergency department at 3, 6 and 12 month intervals for TRAAC clients

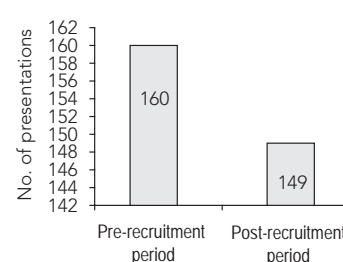
A: 3 months (N = 228; clients recruited after 1/7/2004)



B: 6 months (N = 148; clients recruited after 1/7/2004)



C: 12 months (N = 111; clients recruited after 1/01/2004)



D: Presentations to the emergency department (ED)

	No. presentations to ED	Total patients
3-month period pre recruitment (N=228)	162	97
3-month period post recruitment (N=228)	76	52
% change	53% decrease	46% decrease
Wilcoxon signed ranks test ; <i>P</i> value	$Z = -5.127; P < 0.001$	–
6-month period pre recruitment (N=148)	160	70
6-month period post recruitment (N=148)	94	46
% change	41% decrease	34% decrease
Wilcoxon signed ranks test ; <i>P</i> value	$Z = -3.044; P = 0.002$	–
12-month period pre recruitment (N=111)	160	72
12-month period post recruitment (N=111)	149	51
% change	7% decrease	29% decrease
Wilcoxon signed ranks test ; <i>P</i> value	$Z = -1.496; P = 0.135$	–

low-up,² the assignment of a visiting nurse to act as case manager,³ and the use of fully integrated health care models which provide intensive in-home support in an integrated acute and community care model.⁴

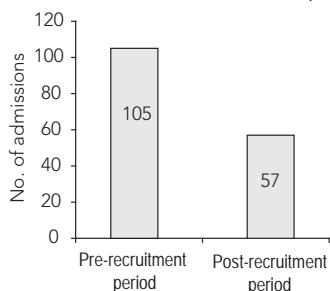
These studies used a number of indicators to measure the success of their intervention to reduce unplanned hospital use. Hospital readmissions over time, combined rates of death and readmission, emergency department presentations over time, admissions to wards from emergency departments, and length of hospital stays have been reported and criticised.^{5,6} Other indicators include use of non-hospital resources (eg,

use of outpatient and community resources) and client outcomes such as quality of life measures, client and carer satisfaction ratings and client overall health status over time.

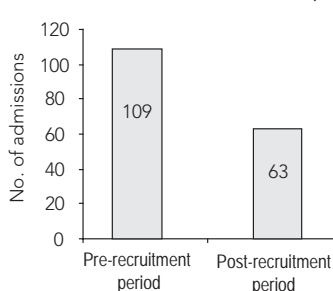
Success rates of different interventions have been variable. The hospital-based nurse, visiting nurse, or nurse case-manager model reported in several studies did not result in reduction in readmission rates or emergency department presentations as well as other measures.^{1,3,7} Brand et al² have discussed some possible explanatory factors for this failure to demonstrate the expected results. These authors have questioned whether readmission rates as an indicator may

3 Total emergency admissions at 3, 6 and 12 month intervals for TRAAC clients

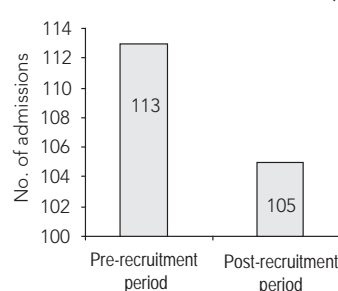
A: 3 months (N = 228; clients recruited after 1/7/2004)



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C: 12 months (N = 111; clients recruited after 1/01/2004)



D: Admissions via the emergency department (ED)

	No. presentations to ED	Total patients
3-month period pre recruitment (N=228)	105	70
3-month period post recruitment (N=228)	57	42
% change	46% decrease	40% decrease
Wilcoxon signed ranks test ; P value	Z = -3.447; P = 0.001	–
6-month period pre recruitment (N = 148)	109	56
6-month period post recruitment (N = 148)	63	38
% change	42% decrease	32% decrease
Wilcoxon signed ranks test ; P value	Z = -2.777; P = 0.005	–
12-month period pre recruitment (N = 111)	113	63
12-month period post recruitment (N = 111)	105	42
% change	7% decrease	33% decrease
Wilcoxon signed ranks test ; P value	Z = -1.053; P = 0.292	–

not be appropriate for multifactorial intervention programs because the health status of the chronically ill may necessitate hospital admission regardless of treatment intervention. Alternatively, they suggest that reducing readmissions “may require higher levels of community support for acute disease exacerbations.”² (p. 282)

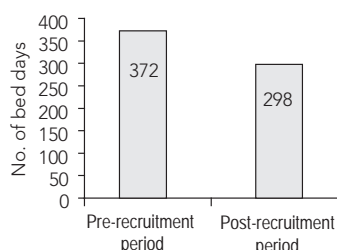
Leung and colleagues⁸ did find significant reductions in utilisation of health services in a randomised controlled trial of frail elderly people who participated in case management provided by community-based nurse case managers. The experimental group demonstrated reductions in number of hospital admissions, number of bed-

days and number of presentations to outpatient departments. Corbett et al⁹ also found positive results in fewer hospital admissions from emergency department presentations and improved quality of life measures for elderly patients receiving a hospital-based care coordination service provided by a multidisciplinary team of care coordinators.

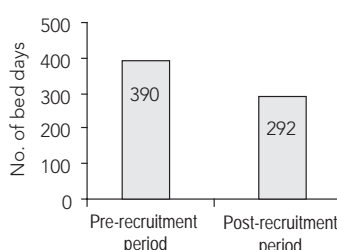
The studies that demonstrate success in minimising hospital admissions and readmissions for elderly people tend to have a number of factors in common. A key feature is the integration of medical and social care by an interdisciplinary team.^{10,11} This integration enables the mobilisa-

4 Total acute bed days used at 3, 6 and 12 month intervals for TRAAC clients

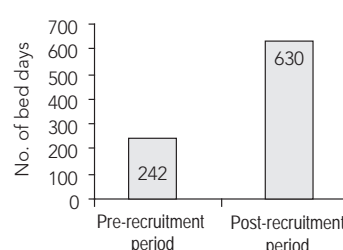
A: 3 months (N = 228; clients recruited after 1/7/2004)



B: 6 months (N = 148; clients recruited after 1/7/2004)



C: 12 months (N = 111; clients recruited after 1/01/2004)



D: Total acute bed-days used

	Total acute bed-days used	Average length of stay
3-month period pre recruitment (N=228)	372	3.54
3-month period post recruitment (N=228)	298	5.22
% change	20% decrease	47% increase
Wilcoxon signed ranks test ; P value	Z = -2.085; P = 0.037	–
6-month period pre recruitment (N=148)	390	3.58
6-month period post recruitment (N=148)	292	4.63
% change	25% decrease	29% increase
Wilcoxon signed ranks test ; P value	Z = -2.079; P = 0.038	–
12-month period pre recruitment (N=111)	242	2.14
12-month period post recruitment (N=111)	630	6.0
% change	160% increase	180% increase
Wilcoxon signed ranks test ; P value	Z = -1.630; P = 0.103	–

tion of high levels of both geriatric diagnostic and treatment resources as well as the range of community supports such as community care, informal support networks and monitoring of wellbeing in the familiar environment of the person's home. With this program model, the case manager works within a multidisciplinary team with members coordinating the input of both acute and community sector expertise.

Programs may partially integrate or, less frequently, fully integrate community and hospital resources. Where full integration is part of the program design, extensive benefits and success on a range of indicators, including reductions in hospital admission and bed occupancy as well as positive patient outcomes such as high satisfac-

tion ratings and quality of life measures, are possible.⁴

Another determining factor is the degree to which the program specifically targets those chronically ill, elderly people either exhibiting, or "at risk" of repeated hospital admissions. Selection into the target group is based on a comprehensive assessment of health and social "risk" factors. Several factors are known to indicate risk for readmission, often acting in combination. These include deterioration in health, medication complication, carer issues, social isolation¹² and older age.^{13,14}

This article discusses the dimensions of a semi-integrated service model providing short-term case management for older, chronically ill

people with complex care needs. The article also presents a brief summary of key outcomes from ongoing quality evaluation that was conducted internally for the Hospital Admission Risk Program (HARP) evaluation initiated by the Victorian Department of Human Services (DHS).

The service structure

The Treatment Response and Assessment for Aged Care (TRAAC) program was set up in 2002 to provide a rapid, intensive intervention to older people at risk of emergency department attendance and/or hospital admission. It was funded as part of the HARP by the Victorian DHS. Initially, the model employed short-term case managers located in the emergency department (ED) of St Vincent's Health, a large inner-city hospital, and in the Aged Care Assessment Service (ACAS) attached to the hospital. It became obvious that case finding needed to occur at an earlier point in a person's deteriorating health situation. Stage two of this program saw its expansion, with the employment of four additional short-term case managers located in community agencies: one each in three local government authorities, and one in the Royal District Nursing Service (RDNS).

A feature of the program is the semi-integrated structure and management of TRAAC. Its structure is designed to build on existing relationships, improve communication and develop processes and systems across agencies to support more integrated service delivery. Although the acute hospital is the HARP funds holder, management of the program involves a partnership of the acute and community-based organisations through the involvement of stakeholders at all levels of program decision making.

The overall governance, strategic planning, future vision and direction for the program is carried out by the Partnership Group. The operational planning and evaluation are the responsibility of the Collaborative Planning Group. The day-to-day program management is carried out by the TRAAC program manager. Each of the

employing agencies provides on-site supervision to their respective case managers, and meets regularly to confirm the program direction.

The multidisciplinary team includes seven case managers with professional qualifications in social work, nursing and occupational therapy. In addition the team has a full-time occupational therapist that provides direct client care. The case managers do not provide direct care interventions related to their disciplines.

Case management intervention model

An essential part of the program design is rapid access by the case managers to geriatrician services. The program funds a flexible geriatrician service to provide a specialist medical service to TRAAC clients. This flexible model enables rapid access to geriatrician consultation determined in collaboration with the case manager and the client's general practitioner, where possible. The TRAAC case managers carry out holistic assessments of health, functional, psychosocial, cultural, environmental and economic factors that determine the risk of hospital admission. The geriatrician carries out a comprehensive medical assessment of a client, which is enhanced by the pre-morbid history gathered by the case manager. The case manager and geriatrician roles complement each other. Not all clients with complex needs referred to the TRAAC program have risk factors that require geriatrician intervention.

The target group for intervention was identified by the use of a risk screen, developed collaboratively by members of the multidisciplinary team. The risk screen determines the eligibility, appropriateness and urgency for a TRAAC response. It screens for hospital presentations, medical and physical conditions, psychosocial factors and service usage. The screen is also used as a guide to complement each practitioner's professional judgment to initially categorise the client in relation to their risk level for an ED presentation.

Short-term case management is defined as up to 6 weeks duration. Following referral, contact

and screening must occur within one working day unless the person is not contactable.

The eligibility criteria are:

- 65 years and over, or has an age-related illness
- Living in the community or hostel-type residential care
- Deemed to be at risk of hospital admission due to rapid change or significant deterioration in health status and/or wellbeing.

Typically, the identified high-risk group is older with a mean age of 81 years and a median age of 82 years. The client cohort includes a number of people who are isolated, reclusive and living in poor home conditions accompanied by a degree of self-neglect.

The most common causes for referral to the program are falls, followed by carer issues, dementia-related issues, and declining function. About 50% of clients are discharged within 4 weeks of admission, 30% of clients require 5–12 weeks of support and the remainder receive case management for over 12 weeks.

The program is able to provide rapid, intensive short-term support and care planning including flexible service brokerage where necessary. Although a primary aim of the intervention is to reduce reactive, unplanned and episodic hospital presentations, TRAAC intervention can facilitate a seamless experience for the client if a hospital admission is necessary.

Evaluation methods

Evaluation was undertaken to determine performance of the program in relation to key objectives articulated by stakeholders. Ethics review and approval was not obtained, as data were collected primarily for service monitoring and quality purposes. The evaluation methods relevant to these objectives are described in Box 1.

Evaluation results

Hospital demand data

Examination of the TRAAC cohort for total presentations to the emergency department at 3 months

showed that there was a 53% decrease in total presentations used by the cohort in comparison with the same period before recruitment (Box 2). At 6 months there was a 41% decrease, and at 12 months the decrease had reduced to 7%. There was a similar trend with examination of the cohort in relation to emergency admissions (Box 3). The results indicate a greater reduction at 3 months with a decrease of 46% of the total number of emergency admissions compared with the pre-recruitment period. At 6 months the decrease was 42%, and then 7% at 12 months.

To measure the utilisation of acute bed-days by the cohort, total acute bed-days were examined at 3, 6 and 12 month intervals using the *equivalent pre/post recruitment* measure. Examination of the use of acute bed-days by the cohort showed that at 3 months there was a reduction of 20% of the total number of bed-days utilised (Box 4). At 6 months there was a decrease of 25%, however at 12 months there was a substantial increase of 160%.

An examination of the cohort at 12 months revealed that 10% of the clients generated 39% of the total admissions which accounted for 66% of the total bed-days used by the cohort (they had used 20 or more bed-days in 12 months).

Analysis of the medical records of “outlier” clients from an earlier dataset with similar results showed that these people were characterised by medically and socially complex conditions and had been highly vulnerable to adverse events. They required multiple episodes of acute care that sometimes involved a long length of stay. Many were eventually transferred into high-level residential care, which may have been yet another factor to cause delay in the acute care setting.

Client satisfaction

Over a 2-month period, 91 clients completed a satisfaction survey. There was a 37% return rate with 12% of the surveys completed by the client and 85% by carers. (One survey was not identified.) 94% of the respondents felt that the support received was what was needed, 79% responded that they were more confident in their living environment and 97% responded that they would contact TRAAC in the future when needed. The

comments received were generally positive and emphasised the responsiveness, support and care coordination offered by the case manager. The comment below indicates the impact of the TRAAC intervention for a particular client:

The speed in which the services were organised was outstanding. The case manager went out of her way to get help and services delivered as a matter of priority; her approach and support was excellent; she made things happen in a positive way.

Staff service integration survey

This survey was administered in December 2004 and was completed by 44/66 staff members giving a 67% return rate overall. A total of 11 TRAAC staff and managers contributed to these returns. A brief excerpt of some results is presented here, indicating key areas where significant improvement was perceived, and other areas that remain issues.

Respondents were asked to use a scale range of 1–5 indicating “great deterioration” (1) through to “great improvement” (5) in response to the following themes. (The mean response to the scale is provided in parentheses.)

- Collaboration between acute and community services (4.1).
- Speed of response to client needs (4.5).
- Overall capacity to organise appropriate care for clients (4.5).
- Your understanding of the knowledge, skills and roles of professionals working in different types of agencies/different sectors (4.1).
- Having to use different databases for client records (3.3).
- Time spent travelling between sites (2.6).

Discussion

The aim of this article is to describe the TRAAC case management model as a service to support elderly people with chronic and complex care needs who are believed to be at risk of emergency department attendance and/or hospital admission. Monitoring of hospital demand over a 1-year period shows that there was a reduction both in the total number of emergency department

presentations and in the total number of hospital admissions for this group when comparing the period before entry onto the program with the same period of time following the recruitment. While the before and after comparison does not allow conclusions to be drawn about whether the short-term case management model caused the changes, the magnitude of the changes at 3 and 6 month intervals post service intervention was statistically significant and encouraging. The use of a before and after design¹⁵ for measurement of the utilisation of acute hospital services (ie, hospital presentations and admissions) has enabled some objectivity in the measurement of change in relation to the use of hospital services, however, the limitations of this approach are that the outcomes cannot be attributed to the activities of the program alone.¹⁶ Alternative events may have influenced the observed change or the change may be in part a natural progression for the cohort that would have occurred with or without the intervention. On the other hand, the complex cohort group provides its own “perfectly matched” control group, ie, “self”, for comparison purposes and may provide suggestive findings.¹⁵

The findings of a large increase in bed-days used by the cohort at 12 months following entry to the program stimulated further examination of the group. The analysis identified that the major increase in total use of acute bed-days could be attributed to a very small group of clients, 10%, who utilised 66% of the total bed-days (they had used 20 or more days in 12 months), which was almost two thirds of the variance. While this finding suggests that the program was not successful in influencing the need for acute bed-days over the longer term, it indicates that the program was successful in identifying that there is a small group of clients within the “at risk” TRAAC population whose situation requires lengthy or frequent hospital stays. Further study of the nature of their complex medical and social conditions may assist in more refined targeting of the program to this group’s needs. These findings have been noted in another study and related to the possible effects of better medical detection

and follow up, and situational factors in transitioning between hospital and nursing home.⁴

The program evaluation did not include a comparison between those clients who had received a geriatrician assessment and those who had not. This is a research question to be considered in the future. Immediate access to geriatrician assessment, where necessary, is a key factor in the preventative model of this program. Referral to the geriatrician is mediated by the case managers who have advanced case management skills. These competencies include effective engagement skills (in situations where the risk of hospital presentation is significant due to client avoidance of contact), rapid risk assessment and care planning skills. The possible application of a phone-based risk matrix tool with prompts for referral to a geriatrician would be likely to miss subtle indicators detectable only through home visits and contact with other informants, including the general practitioner.

A further research question is to investigate the impact of admission to nursing home or hostels during the intervention period. For this discussion data were not collected on the proportion of TRAAC clients admitted to alternative care to enable an investigation of whether this cohort had a lower rate of admission to ED or to hospital. Consideration of the multiple variables influencing relocation would also need to be examined.

Key strengths of the program which have the potential to contribute to successful intervention are threefold: it is preventative; it links community and acute sector resources and knowledge; and it has rapid access to geriatric advice and diagnosis. It was also heartening to see that clients and carers gave positive feedback of their satisfaction when surveyed, indicating that the delivery of care was well regarded.

The program focuses on prevention through early case finding, made possible by referrals of clients from community-based services such as council Home and Community Care (HACC) services and the RDNS, as well as self-referrals from clients and carers. Community-based TRAAC case managers can utilise community

supports and neighbourhood contacts to help engage with a client potentially “at risk” because of complex health needs and service avoidance. The location of TRAAC case managers in the ED department as well as the ACAS provides multi-site entry points. TRAAC’s emphasis on community links is shared by other programs,⁹ however it extends this by enabling not only the locating of cases in the community setting, but also the employment of staff by a range of community providers with varied expertise.

The employment of case managers in a range of locations necessitates the operation of a “virtual team”. Virtual teams have potential advantages — there is the possibility of greater understanding being gained of the roles of different agencies, the benefit of networking, and sharing knowledge and expertise in contributing to client outcomes. Systemically it offers the opportunity to develop a more integrated model of service. Baird and Rushford¹⁷ discuss the advantages and disadvantages of the virtual team which can be mirrored within the TRAAC team experience. For example, Baird and Rushford discuss the importance of communication within a virtual team environment. Effective communication within any team setting is crucial to the team’s success: within the virtual environment of the TRAAC team it is essential and a challenge that the team experiences daily. A challenge to effective communication is the diversity of the professional backgrounds and the organisational culture of the agencies in which the case managers are placed.

Regular team meetings as well as team building sessions are strategies employed to minimise the virtual team effects of isolation and multiple accountabilities.

The TRAAC program strives to integrate care across the acute and the community sector; however, it is not a fully integrated health care model because it is built on system links and protocols between partner organisations, rather than the establishment of “a single accountable organisational structure”.⁴ (p. 20) Despite this, staff perceived considerable improvements in integrated service delivery. Their capacity to be responsive to client needs, their increased understanding of

agencies in other sectors and greater collaboration between them were rated as much improved in the current service model. They also flagged some issues such as electronic information exchange and travel between sites as being difficult for them in the current model. This information was used to identify and prioritise issues that needed to be addressed in future service development in a more informed way.

The program meets four of the six key elements of fully integrated systems that we identified. The element of geriatric philosophy and focus is a feature of the program. The role of the TRAAC geriatrician is an important element in our service model to provide access to this specialised field of knowledge.

The two key elements missing from our health care model in terms of full integration, are: the provision of longitudinal care management and the capacity to pool funding streams. TRAAC clients are offered short-term case management up to the point of hospital admission, and generally, no further. This feature has proved to be a barrier to seamless client movement through hospital and community settings. In contrast to the Northern Hospital model that has no cut-off point,⁹ the TRAAC program does not retain case management responsibility once the client is admitted to hospital, whether for a short or long stay.

Conclusion

The outcomes of this service so far suggest that the short-term case management model has a contribution to make in preventing unplanned hospital presentations and admissions. The multidisciplinary, multilocation model of intervention, allied to careful targeting through risk screening and access to specialist geriatric advice and diagnosis, may prove an effective preventative approach.

Overall, it is significant to find that staff members have experienced positive changes working in the TRAAC model after 2 years of operation. Understanding the perceptions of staff and man-

agers is fundamental to understanding the successes and failures of new ways of working.

Future directions of the program are aimed at improved collaboration and capacity for multidisciplinary and multi-agency work essential for the development of a culture that supports integrated service delivery. The program works at the interface of the different cultures of the acute and the community sector — on the belief that the enhanced integration of the sectors, provides a “whole” that provides much greater benefits to the clients than the sum of the parts.

There is support and encouragement for these changes to be achieved at the local level, however there is recognition that the broader health system also impacts on the evolution and success of an integrated model.

Competing interests

The authors declare that they have no competing interests.

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