Title Page

Post–discharge geriatric evaluation and management for patients from residential care. (The Residential Care Intervention Program in the Elderly (RECIPE))

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Abstract

**Background:** Geriatric evaluation and management has become standard care for community dwelling older adults following an acute admission to hospital. It is unclear whether this approach is beneficial for the frailest older adults living in permanent residential care. This study was undertaken to evaluate (1) the feasibility and consumer satisfaction with a geriatrician-led supported discharge service for older adults living in residential care facilities (RCF) and (2) its’ impact on the uptake of Advanced Care Plans (ACP) and acute health care service utilisation.

**Methods:** In 2002-4 a randomised controlled trial was conducted in Melbourne, Australia comparing the geriatrician–led outreach service to usual care for RCF residents. Patients were recruited during their acute hospital stay and followed up at the RCF for six months. The intervention group received a post-discharge home visit within 96 hours, at which a comprehensive geriatric assessment was performed and a care plan developed. Participants and their families were also offered further meetings to discuss and document ACPs. Additional geriatrician reviews were made available for assessment and management of intercurrent illness within the RCF. Consumer satisfaction was surveyed using a postal questionnaire.

**Results:** The study included 116 participants (57 intervention and 59 controls) with comparable baseline characteristics. The service was well received by consumers demonstrated by higher satisfaction with care in the intervention group compared to controls (95% versus 58%, p=0.006). ACPs were completed by 67% of participants/proxy decision makers in the intervention group. At six months there was a significant reduction in outpatient visits (intervention group 21 (37%) versus controls 45 (76%), (p < 0.001), but no difference in readmissions rates (39% intervention versus 34% control, p=0.6). There was a trend towards reduced hospital bed-day utilisation (intervention 271 versus controls 372 days). **Conclusion:** It is feasible and acceptable to consumers to provide a supported discharge service that includes geriatrician assessment and care planning within a RCF. By expanding the service there is the potential to for acute health care cost savings by decreasing the demand for outpatient consultation and further reducing acute care bed-day utilisation.
Post–discharge geriatric evaluation and management for patients from residential care (The Residential Care Intervention Program in the Elderly (RECIPE)).

Introduction

The demography of the Australian population is changing resulting in a greater need for the health care system to develop innovative models of care that will meet the complex needs of frail, older adults in a community setting [1]. The correlation between increasing age and reduction in functional ability means that older adults are large consumers of acute hospital care and commonly have longer lengths of stay than younger persons [2]. Evidence suggests that when admitted frail older adults are at an increased risk of adverse effects, such as physical de-conditioning, functional decline, pressure injuries, malnutrition, falls and acute delirium [3-4].

Changing health care policies, together with closure of hospital beds and shortened length of stay have seen a trend towards community caring for older people [1,4,5]. Older people often have complex needs requiring specific care tailored to their needs [6-8] and general practitioners (GPs) also need access to expert advice to support them in the provision of optimal medical care [9]. Specialist services that provide comprehensive geriatric assessments and subsequent acute care in the community are one alternative to sending older adults to hospital. These services aim to uncover the multidimensional problems that these individuals experience, with the purpose of implementing coordinated medical and psychosocial care tailored to their needs. The effectiveness of this approach for community-dwelling adults is well-documented; however there is less evidence surrounding its effectiveness for those in long-term residential care facilities (RCF) [9].

The proportion of adults dying within residential aged care facilities (RCF) is also rising. In the United States (US) it is estimated that 67% of residents will die within their facility [10]. These trends highlight the need to promote the use of Advance Care Planning (ACP) within RCF and to up-skill residential care staff in the provision of palliative care [11-14]. When these discussions are backed up by formal documentation ACP can facilitate decision making at a future crisis point, easing the burden on family, facility staff and other health professionals [11]. Despite the willingness of older adults to discuss their preferences for end-of-life care and the benefits of formally documented ACP, its’ uptake in RCF has been relatively low [15, 16].
As more people enter long-term institutional care; innovative models of medical service delivery will be imperative, to promote best practice for residents whilst containing healthcare costs [5, 17]. The Residential Care Intervention Program in the Elderly (RECIPE) service is based in Melbourne, Australia and provides expert comprehensive assessment and management by geriatricians and aged care nurse specialists to individuals living in RCF who are at imminent risk of requiring acute care management. The aim of the service is to improve residents’ quality of life by providing them with optimal medical care within the facility, increase uptake of ACP, promote greater consumer engagement in their care, and to improve communication between RCF and acute care clinicians. It was anticipated that if these aims were achieved then emergency department attendances would also be decreased. In 2002 the hospital aged care unit established the service and promoted it to RCFs and general practitioners (GPs) in their catchment area At this time, a comprehensive health service evaluation was undertaken to evaluate the feasibility, acceptability to consumers, and the potential of this model of care to decrease acute health care utilisation. This paper presents the findings of the feasibility study and suggests strategies for evaluating the impact of these services in the future.

Methods
Study Design
In 2002-04 we conducted a randomised controlled trial of a supported discharge intervention for patients aged 65 years or older admitted to hospital from RCF in outer metropolitan Melbourne, Australia. To efficiently utilise limited resources the patient rather than the facility was chosen as the unit of randomisation. Patients being discharged to RCF were invited to participate during their index hospital admission and were followed for six-months. Patients were excluded if they were less than 65 years of age, were not living permanently in RCF, had already been enrolled, had non-medical primary diagnoses, were expected to die during their index admission, lived outside the health service catchment area, exhibited severe behavioural disturbance, or consent was not obtained for study participation. Patient were randomised in a 1:1 ratio using a computer generated random number sequence and study allocations were placed in pre-numbered, sealed envelopes. The study team allocated each patient to the next consecutive number at discharge from acute care. They had no control over the timing of discharges, and the treating medical units were blinded to the study allocation. Ethics approval was obtained from the Northern Health Human Research Ethics Committee and written informed consent was obtained from competent patients or the person responsible if the patient lacked capacity.
**Intervention** The RECIPE team comprised two part-time geriatricians and an aged care nurse consultant. All intervention group patients were reviewed in the RCF within four days of discharge. At the first visit, a comprehensive assessment and a tailored care plan was developed. Appropriate services were provided and patients were offered further visits for review of intercurrent illness if required. The service also provided education and support to RCF staff and the patients’ primary care physician.

**Usual Care** The usual care group was managed by the treating medical unit according to standard hospital protocols and received standard discharge planning, with follow-up at the RCF by their primary care physician service.

**Study Assessments** Baseline demographics, medical history, current medications, quality of life was measured using the Quality of Life-Alzheimer’s Disease (QOL-AD) instrument [18,19], and cognition was assessed using the Abbreviated Mental Test Score (AMTS) [19] or Mini Mental State Examination (MMSE) [20]. Barthel Index [21] was used to measure physical function, and Short Zung Interviewer-assisted Depression Scale [22] was used to assess mood. Both groups were visited by the research team three times over six months for data collection. The Barthel Index, the number of medications and number of co-morbidities were used as proxy measures of illness severity and frailty amongst residents.

**Outcomes** Data was collected on the uptake of advanced care planning by residents and their families and their stated preferences for end of life care. Administrative data was obtained on utilisation of hospital-based clinical services included: inpatient admission (acute or sub acute), outpatient and day procedure visits.

**Consumer feedback** surveys were distributed to patients (where appropriate) and family members from both study groups and a staff feedback survey was conducted regarding service quality and effectiveness. The surveys were distributed with a stamped, self-addressed envelope within four weeks of the six month discharge visit, or death.

**Statistical Analysis** Statistical analysis was performed using the Statistical Package for Social Scientists (SPSS; Chicago, Illinois, version 11.0) on an intention to treat basis. Categorical data was summarised using means and percentages and continuous data using mean, standard deviation (SD) and range. Categorical outcomes were compared between groups using chi square tests and logistic regression and continuous variables were compared using independent sample t-tests. Tests of significance were two-tailed, using a significance level of \( p \leq 0.05 \).

**Sample size**
We estimated that 550 subjects were needed to detect a 10% difference in acute care readmission rates at 80% power, and an alpha level of 0.05. An interim analysis of the study results was
conducted at 18 months to review the feasibility of the service and the appropriateness of the evaluation strategy. At this time point 123 patients had been randomised into the study.

**Feasibility**
The feasibility of the service was measured by: consumer feedback regarding the acceptability of the service, improvements in residents’ quality of life and functional outcomes, uptake of ACP and changes in acute health care utilisation. The appropriateness of the study design was measured by assessing study recruitment rates and reasons for non-enrolment and the sensitivity of the study outcome measures to detect changes in residents’ health status.

**Results**

**Study Recruitment**
Over 18 months, 457 patients were screened and 334 excluded. 123 patients were included in the study (Figure 1), 37% of patients in each group were male. Comparing included and excluded patients: the mean age was 84 (SD 8) years versus 82 (SD 10) years; 63% versus 54% were born in Australia; and 72% versus 65% spoke English as their primary language.

**Baseline Characteristics**
Of the 123 study participants, 57 patients were randomised to the intervention group and 59 patients to usual care. Participants were spread across 45 facilities and primary care was provided by more than 60 GPs. Intervention group patients were younger (mean age 83.8 vs 86.7 years, p = 0.02) and had more comorbidities than controls (mean number 7.7 vs 5.7, p < 0.001), (Table 1). Marked dependence occurred in 42% of controls versus 32% of intervention patients, and there was no significant change in functional scores in either group over time. At baseline 33(58%) of the intervention group and 35(59%) of controls completed the QOL-AD instrument. Due to increasing frailty and the high mortality rate, only 93% repeated the questionnaire at one month and 66% at six months. There were no significant differences between groups in quality of life at baseline and no significant changes within either group over time.

**Mortality**
The overall six-month mortality was 38% with no difference between groups; (controls (37%) versus intervention (39%), (p > 0.05). In the control group 11(50%) of deaths occurred within one month of randomisation, compared with 7(32%) of deaths in the intervention group, p=0.20. There was no significant difference in age, hospital length of stay, number of medications, co-morbidities, depression scores or study group between survivors and non-
survivors. Survivors had better cognition scores (mean MMSE 13.4 versus 6.4, p=0.01) and better functional status that those who died (mean Barthel score 48 versus 34, p=0.04).

**Advance Care Plan Completion**

Of the 54 (95%) intervention group residents who survived to the first post-discharge visit and could be offered an ACP discussion, 36 (67%) documented an ACP during the six-month follow-up (mean days from initial discussion to written documentation was 40 days, range 0 to 184). Only 8% of residents completed an ACP themselves, the majority being documented by legally appointed proxy decision makers (33%) or family members (69%). Of those with a completed ACP 56% avoided a subsequent hospital admission, and 44% were readmitted at least once. Of those with completed ACPs, 78% of residents/proxies preferred to receive acute treatment for medical deteriorations within the facility however, 42% also considered acute care admission to be a reasonable option. Most participants did not want aggressive medical treatment including cardiopulmonary resuscitation (CPR) (70%). However 83% wanted to have initial medical investigations performed and to receive limited active treatment (eg: blood tests and intravenous antibiotics) for reversible conditions such as acute infection.

**Consumer Feedback**

Resident/family satisfaction surveys were distributed to 78% of participants with a response rate of 49%. The majority (80%) of the intervention group (compared with 45% of controls) had the subjective impression was that the RECIPE service had successfully helped to avoid hospital readmission (Table 2). The GP survey response rate was 49% with the majority caring for intervention group patients. In this group 65% found the service useful, 75% agreed that RECIPE was an attractive alternative to hospitalisation and 70% reported that residents were less likely to be sent to hospital.

**Service Feasibility**

Patient recruitment was slower than expected mainly due to difficulties in obtaining written informed consent. There were high numbers of eligible patients who were frail and cognitively impaired, and their family members were reluctant to consent for research that might cause increased fatigue or anxiety. Recruitment was slower at the start of the study and improved as RACF staff and GPs become familiar with the service and could appreciate its potential benefits. Carers were happier to provide consent if they knew there would be an additional service, rather than taking a 50% chance that they would get “nothing”. By the end of the recruitment period family and facility staff were highly supportive of the service appearing disappointed when a
resident allocated to the control group. This positive feedback was reflected in a high retention rate after randomisation and consumer feedback that indicated that the benefits of participation outweighed the costs.

Due to slower than anticipated recruitment rates and high mortality rates the study was underpowered to demonstrate an impact on acute healthcare readmission rates. Over the six-month follow-up, there were a total of 28 ED presentations from controls and 19 from the intervention group (p=0.4). The overall readmission rate was 36%, (intervention group 22/57 (39%) versus controls 20/59 (34%), (Table 3). Factors predictive of readmission were: length of stay at the index admission (readmitted 9 days versus not readmitted 12 days, p = 0.02) and the number of medications on recruitment (readmitted 11 versus not readmitted 9, p = 0.03). Control group patients used 372 bed-days over six months versus 271 bed-days by the intervention group (Table 2).

An unexpected finding was however that rapid access to geriatrician review in the RCF did have an impact on the number of hospital ambulatory care visits. Intervention group patients 21/57 (37%) were significantly less likely to need to attend medical outpatient clinics than controls 45/59 (76%), (p < 0.001).

**Discussion**

This study has demonstrated that it is feasible and acceptable to provide a geriatrician consultation service for people living in long-term RCF. Rapid access to geriatrician review had a significant impact on the demand for outpatient specialist review, and may provide one mechanism to address burgeoning demand on hospital ambulatory care services. Acute care readmissions and mortality were equivalent between the two groups indicating that managing acute medical deteriorations within RCFs is a viable alternative to acute care admission and does not place patients at risk of worse clinical outcomes.

Although the main focus of the intervention was providing alternatives to future acute care admission, the high six-month mortality rate highlighted the need for advanced care planning discussions and the provision of end of life care within the RCF. We found that a proactive program that promotes and facilitates ACP discussions in RCF is well accepted by patients, and their proxies/families. This aspect of the intervention appears to have addressed an important gap in communication around end of life care and provision of palliative care services within RCF.
[23], despite this a number of barriers remain to be addressed before this practice becomes widespread [24, 25].

**Strengths and Weakness of the Study**

This number of patients screened for eligibility over an 18-month period was smaller than expected, possibly because retrospective administrative data overestimated the number of permanent RACF residents in our catchment and because screening was only conducted during office hours. Despite the identified barriers to recruitment, the enrolment rate in this study was higher than that previously reported in RCF, possibility related to the inclusion of patients requiring palliative care [26]. Recruitment improved as RCF staff and GPs become familiar with the service and could appreciate and promote its potential benefits. This was reflected in our high retention rate after randomisation and consumer feedback that indicated that the benefits of participation outweighed the costs [27]. This study was underpowered to demonstrate an impact on acute care readmission rates and the lower than anticipated recruitment rates indicates that a multi-site study would be required to achieve adequate patient numbers to achieve statistical power within a reasonable timeframe.

The Barthel Index, the number of medications and co-morbidities were used as proxy measures of illness severity amongst residents, however these measures were not appropriate once patients entered the palliative stage of their illness. In future studies measures such as the Cumulative Illness Rating Scale for Geriatrics [28] may be able to discriminate more accurately different levels of illness severity and hospitalisation risk in the RCF population. The measures of patient reported outcomes (PROs) chosen for this study were selected as they were validated, sensitive to change and brief [19, 29], despite this the majority of patients struggled to complete all questionnaires at one visit. Similar to previous studies [30] the high prevalence of cognitive impairment meant that PROs were only assessed in a sub-group of participants and in the sub-group of patients who completed these measures there were no significant changes over time. Given the frailty of participants in this study and the number who later required supportive and palliative care it appears that in future studies shorter follow-up times (to increase completion rates at follow-up) and alternative measures of the quality of supportive care provision may be more appropriate [31].
**Conclusion**

This study has demonstrated that it is feasible and acceptable to provide a post-discharge outreach service to frail older people living in RCFs. The hypothesis that a post discharge, multidisciplinary assessment and management program could reduce readmissions and improve quality of life could not be proven, in part related to the unexpectedly small sample size. Although the main focus of our study intervention was comprehensive geriatrician assessment and chronic disease management, it became clear that there was also a need for advanced care planning and palliative care support in RCFs in Australia. Consent for entry into randomised controlled trials will remain one of the difficult issues, a cluster randomized controlled trial of aged care facilities rather than individuals may be one way to overcome this barrier to recruitment in future studies.

Our results indicate that a multi-faceted approach is required to have a substantial impact on acute care readmissions rates. One alternative to a patient–level intervention would be a cluster randomised controlled trial of a facility level intervention focusing on staff education and skills and raising awareness of residents and their families regarding treatment and care options [32]. Strategies that would need to be incorporated into this approach include: up-skilling of RCF staff in management of acute deteriorations [33], increased access to telehealth consultations as an alternative to emergency department attendance when primary care physicians are unavailable for consultation and increased use of ‘Hospital in the Home’ services [34]. Since completion of this initial evaluation the RECIPE service has been extended to include these components and further evaluation of its’ impact on acute care utilisation over the longer–term is currently being undertaken with a larger sample size of patients.
Abbreviations:

AMTS  Abbreviated Mental Test Score
ACP   Advance Care Plan (planning)
CPR   Cardiopulmonary Resuscitation
ED    Emergency Department
GP    General Practitioner
MMSE  Mini Mental State Examination
QOL-AD Quality of Life in Alzheimer’s Disease
RCF   Residential Care Facility
RECIPE Residential Care Intervention Program in the Elderly
SD    Standard Deviation

Competing Interests

The authors have no competing interests to declare.

Author contributions

PH was involved in study design, implementation of the intervention, data collection, management & analysis and preparation of the manuscript; MS was involved in implementation of the intervention and data collection; DJB, BJ & WKL contributed to study design, supervision of the clinical team, data analysis and manuscript preparation; AH was involved in data analysis, interpretation of study findings & manuscript preparation. All authors have read and approved the final manuscript.

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References

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Figure

Title - Flow diagram of patients included in this analysis
Table 1: Baseline Characteristics of Study Patients

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Intervention (n=57)</th>
<th>Control (n=59)</th>
<th>Significance (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Mean, SD) years</td>
<td>83.8 (7)</td>
<td>86.7 (7)</td>
<td>0.02</td>
</tr>
<tr>
<td>Male n (%)</td>
<td>19 (33)</td>
<td>24 (41)</td>
<td>0.45</td>
</tr>
<tr>
<td>Low-level RACF n (%)</td>
<td>27 (47)</td>
<td>26 (44)</td>
<td>0.85</td>
</tr>
<tr>
<td>Australian born n (%)</td>
<td>34 (60)</td>
<td>38 (64)</td>
<td>0.43</td>
</tr>
<tr>
<td>English speaking (%)</td>
<td>44 (77)</td>
<td>45 (76)</td>
<td>0.66</td>
</tr>
<tr>
<td>Severe Dementia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMTS** &lt; 4/10</td>
<td>47%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(&gt; 70 Zung Depression Scale)</td>
<td>7%</td>
<td>3%</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Index Admission

| Primary Reason n (%)                |                    |                |                        |
| Pneumonia                           | 18 (31)            | 16 (27)        | NS                     |
| Urinary tract infection             | 7 (12)             | 8 (14)         | NS                     |
| Heart failure                       | 7 (12)             | 4 (7)          | NS                     |
| Anaemia                             | 5 (9)              | 7 (12)         | NS                     |
| Volume depletion                    | 6 (10)             | 6 (10)         | NS                     |
| Cellulitis                          | 2 (4)              | 4 (7)          | NS                     |
| Chest pain                          | 1 (2)              | 7 (12)         | NS                     |
| Cerebrovascular event               | 3 (5)              | 2 (3)          | NS                     |
| Chronic obstructive pulmonary disease| 2 (4)             | 1 (2)          | NS                     |
| Other                               | 6 (11)             | 4 (7)          | NS                     |
| Number of medications (mean, SD)+   | 10.4 (4.4)         | 8.5 (3.9)      | 0.05                   |
| Number of co-morbidities (mean, SD)#| 7.7 (2.7)         | 5.7 (2.5)      | <0.001                 |
| Index length of stay * (mean, SD)   | 10.1 (12.6)        | 12.1 (15.7)    | 0.53                   |
| (Median, IQR)                       | 6.0 (4-10)         | 7.0 (4-13)     |                        |

No of Follow-up Visits (mean number per patient)

| Standard visits (study data collection) | 2.4 | 2.6 | NS |
| Family meetings                        | 1.2 | nil |    |
| Allied health referrals                 | 0.6 | nil |    |
| Hospital in the home referrals         | 0.5 | nil |    |
| Palliative care referrals               | 0.2 | nil |    |
| **Total number of study reviews & RACF visits** | **16.7** | **5.2** | NS |

**Abbreviated Mental Test Score (AMTS) or Mini Mental State Examination (MMSE)**

+ Number of regular and as required medications listed on medication discharge list printed by hospital pharmacy

*Number of days spent in hospital during the admission for which the patient was invited to participate, including acute and sub acute bed-days.

# Combined number of active medical problems listed on medical admission notes and discharge summaries
Table 2: Consumer feedback - Family/resident satisfaction with the RECIPE service versus usual care.

<table>
<thead>
<tr>
<th>Service Provided</th>
<th>Intervention n=20</th>
<th>Control n=24</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical assessment &amp; treatment</td>
<td>19 (95%)</td>
<td>10 (42%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Education</td>
<td>18 (90%)</td>
<td>13 (54%)</td>
<td>0.018</td>
</tr>
<tr>
<td>Level of Care Assessment</td>
<td>10 (50%)</td>
<td>7 (29%)</td>
<td>NS</td>
</tr>
<tr>
<td>General Assessment</td>
<td>18 (90%)</td>
<td>15 (63%)</td>
<td>0.044</td>
</tr>
<tr>
<td>Advice/phone contact</td>
<td>19 (95%)</td>
<td>10 (42%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Purchase of services</td>
<td>11 (55%)</td>
<td>7 (29%)</td>
<td>NS</td>
</tr>
<tr>
<td>Coordination of care</td>
<td>12 (60%)</td>
<td>5 (21%)</td>
<td>0.013</td>
</tr>
<tr>
<td>Development of care-plan</td>
<td>18 (90%)</td>
<td>9 (38%)</td>
<td>0.002</td>
</tr>
<tr>
<td>Advanced Care Planning</td>
<td>17 (85%)</td>
<td>9 (38%)</td>
<td>0.002</td>
</tr>
<tr>
<td>Patient Review</td>
<td>19 (95%)</td>
<td>15 (63%)</td>
<td>0.013</td>
</tr>
<tr>
<td>Family Discussion</td>
<td>19 (95%)</td>
<td>12 (50%)</td>
<td>0.002</td>
</tr>
<tr>
<td>Response times</td>
<td>16 (80%)</td>
<td>9 (38%)</td>
<td>0.006</td>
</tr>
<tr>
<td>Overall satisfaction</td>
<td>19 (95%)</td>
<td>14 (58%)</td>
<td>0.006</td>
</tr>
</tbody>
</table>

*Highly satisfied = number of respondents selecting “useful or very useful” or “satisfied or very satisfied” and for response times “very good or excellent”
### Table 3: Hospital Utilisation

<table>
<thead>
<tr>
<th>Number of readmissions</th>
<th>All Patients N = 116</th>
<th>Intervention</th>
<th>Control</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Care (N)</td>
<td>55</td>
<td>29</td>
<td>26</td>
<td>0.47</td>
</tr>
<tr>
<td>(Mean, SD) / Patient</td>
<td>0.47 (0.77)</td>
<td>0.51 (0.76)</td>
<td>0.44 (0.79)</td>
<td>0.60</td>
</tr>
<tr>
<td>Sub-acute Care (N)</td>
<td>10</td>
<td>4</td>
<td>6</td>
<td>0.75</td>
</tr>
<tr>
<td>(Mean, SD) / Patient</td>
<td>0.09 (0.31)</td>
<td>0.07 (0.26)</td>
<td>0.10 (0.36)</td>
<td>0.60</td>
</tr>
<tr>
<td>Total (N)</td>
<td>65</td>
<td>33</td>
<td>32</td>
<td>0.61</td>
</tr>
<tr>
<td>(Mean, SD) / Patient</td>
<td>0.56 (0.89)</td>
<td>0.58 (0.84)</td>
<td>0.54 (0.93)</td>
<td>0.80</td>
</tr>
</tbody>
</table>

#### Hospital Bed-days

<table>
<thead>
<tr>
<th>Index LOS (total days)</th>
<th>1289</th>
<th>573</th>
<th>716</th>
</tr>
</thead>
<tbody>
<tr>
<td>(mean, SD) / patient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Care Readmit (total days)</td>
<td>388</td>
<td>10.0 (12.6)</td>
<td>12.1 (15.7)</td>
</tr>
<tr>
<td>(mean, SD) / patient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-acute Readmit (total days)</td>
<td>255</td>
<td>3.4 (6.5)</td>
<td>3.3 (6.9)</td>
</tr>
<tr>
<td>(mean, SD) / patient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Bed-days over follow-up</td>
<td>643</td>
<td>271</td>
<td>372</td>
</tr>
<tr>
<td>(mean, SD) / patient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total bed days: index + readmission</td>
<td>1932</td>
<td>4.8 (9.2)</td>
<td>6.3 (17.2)</td>
</tr>
<tr>
<td>(mean, SD) / patient</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total Bed-days over follow-up | 643 | 271 | 372 |
| (mean, SD) / patient   |      |     |     |
| Total bed days: index + readmission | 1932 | 4.8 (9.2) | 6.3 (17.2) | 0.55 |
| (mean, SD) / patient   |      |     |     |
Admitted from RACF, inpatient on weekdays, n=457 patients (574 episodes)

Excluded n=334
- Primary dx does not fit (n=83)
- Age<65 (n=8)
- Outside Catchment (n=31)
- Interim Care (n=12)
- Palliative/died in hospital (n=56)
- Consent not obtained (n=139)
- Behavioural issues (n=5)

Randomized (n=123)

Interval (n=61)
- Dropped out (n=1), Too young (n=3)

Control (n=62)
- Moved out of area (n=1), Too young (n=1), Data lost (n=1)

Died before 6/12 visit
- n=57
- n=22

Survived to 6 month visit
- n=59
- n=37

Figure 1: Flow diagram of patients included in this analysis
Additional files provided with this submission:

Additional file 1: CoverPage RECIPE.doc, 46K
http://www.biomedcentral.com/imedia/6252016281010201/supp1.doc