

SUBSTUDY 13

THE GERIATRIC OUTCOME EVALUATION STUDY (GOES)

**A Report Prepared for
the Health Transition Fund, Health Canada**

January 2001



National Evaluation of the Cost-Effectiveness of Home Care



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National Evaluation of the Cost-Effectiveness of Home Care
#308-895 Fort Street
Victoria, B.C.
V8W 1H7
Tel (250) 384-2776
Fax (250) 389-0105
info@homecarestudy.com
<http://www.homecarestudy.com>

-or-

H.A. Tuokko, PhD
Centre on Aging
P.O. Box 1700
University of Victoria
Victoria, B.C.
V8W 2Y2
Tel (250) 721-6576
Fax (250) 721-6499
htuokko@uvic.ca

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by Holly A. Tuokko, Ph.D. and Theodore Rosenberg, M.D.

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PREFACE

The National Evaluation of the Cost-Effectiveness of Home Care is an integrated program of research with 15 studies being conducted across Canada. There is an overall strategy for the program of research to make it as useful to administrators and decision makers as possible. The program of research is designed to determine whether or not home care is a cost-effective alternative to institutional care, that is care in long term care facilities and acute care hospitals. However, the program of research is also designed to provide an educational function to inform decision makers and the public about home care, and to provide advice about issues related to implementing new and cost-effective home care initiatives. Thus, the overall strategy has the following components:

- Conduct studies to determine whether or not home care is a cost-effective alternative to institutional care, and if so, under what conditions it is cost-effective.
- Conduct studies to inform decision makers about the nature and scope of home care services across Canada. These studies provide a baseline of information about home care clients, costs, and utilization. This baseline is important because there is currently no national database on home care in Canada.
- Conduct studies to explore opportunities for potential savings in the hospital sector by substituting home care services. At present there are relatively few areas noted in the literature where home care has been shown to be a cost-effective alternative to hospital care.
- Conduct studies to provide decision makers with information about some of the issues they may face if they try to implement new initiatives to enhance the cost-effectiveness of the health care system.

This study, *The Geriatric Outcome Evaluation Study (GOES)* explores the substitutability of services within a spectrum of care developed for a geriatric services program. The study examines how a geriatric day hospital fits into a broad spectrum of geriatric of services in Victoria, British Columbia.

Neena Chappell, PhD
Co-Director
National Evaluation of the
Cost-Effectiveness of Home Care

Marcus Hollander, PhD
Co-Director
National Evaluation of the
Cost-Effectiveness of Home Care

EXECUTIVE SUMMARY

This project, the Geriatric Outcomes Evaluation Study, explored the concept of substitutability of services within the structure of a spectrum of care developed for a geriatric services program. Specifically, we were interested in examining how a geriatric day hospital (GDH) fits within this spectrum of services. In the context of the geriatric services program in Victoria, British Columbia, the GDH is seen as a mechanism for meeting the needs of those geriatric patients who have multiple problem areas, who require multidisciplinary consultation, and for whom there is an expectation that the patients would benefit from outpatient case rehabilitation and clinical case management. In Canada, GDHs have emerged as one of a variety of services available to older adults yet there is a paucity of information concerning the effectiveness of these programs. Speculations as to the cost effectiveness of GDH treatment assume 1) substitutability and availability of these programs, 2) that patients in one program (e.g., inpatient rehabilitation) can be served as adequately through GDHs as through the inpatient unit, and 3) that outcomes may be measured using an appropriate set of standard instruments.

To address the issue of substitutability of services within an existing structured geriatric services program, data were obtained for all persons admitted to each of the 5 service components (i.e., outpatient - Geriatric Outpatient Clinic and Geriatric Day Hospital; inpatient - inpatient - Postacute geriatric rehabilitation [7C], Geriatric rehabilitation for persons admitted directly from the community [7D], and Psychogeriatric Rehabilitation [Homer 2]). Measures of mental health, physical health, daily functioning and bodily pain were administered to persons attending all of the services within the Geriatric Services Program at admission, discharge and 4 months post-discharge. Measures of health status, depression and reactions to caregiving were administered to family members involved in providing care to these persons at admission, discharge and 4 months post-discharge. Data on health care utilization and costs of care were obtained through existing data bases, manual record review and report of caregivers and addressed issues related to costs of self-care, informal care, and formal care.

The central finding of this study was that persons admitted to each of the service components of the geriatric services program differed with respect to their profile of mental health, physical health, daily functioning and bodily pain. This supports the notion that these services represent a spectrum of care and that one service is not substitutable for another. That is, each service is addressing the needs of a specific subpopulation. Within each service, health status appeared to improve when receiving care, and examination of the sustainability of improved health status over time supported the present model of care in that little change in functioning was seen from discharge until 4 months post-discharge. Unfortunately, we were unable to assess the cost-effectiveness of the various services and so it was not possible to determine if there could be a cost-effective substitution of services.

These findings support the notion that a spectrum of care services are required for geriatric care and that health benefits are realized and sustained across a broad spectrum of services. Included in this report are some of the many valuable lessons learned during the implementation phase of the

study. This report addresses only the findings relevant to the specific objectives of the project. The rich data available will be further examined with respect to a variety of specific topics in the future.

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CHAPTER 1: INTRODUCTION

This final report documents the procedures used, the difficulties encountered, and synthesizes the results obtained from the 9 month project entitled “Geriatric Outcome Evaluation Study.” The research project began formally in May 1999 and ended in March 2000. The overall goal of the project was to examine the notion of a continuum or spectrum of care provided within a geriatric services program. The research was conducted by H. Tuokko, Centre on Aging and Department of Psychology, University of Victoria and T. Rosenberg, Department of Geriatric Services, Capital Health Region (CHR). It was carried out with collaborators from within the Department of Geriatric Services, CHR.

This report is divided into five sections. The first section introduces the study. Section 2 outlines the four major research objectives of the study. The research methods used to achieve these objectives are then described. This is followed by a discussion of the difficulties encountered in meeting these objectives. Finally, in section 5, the key findings are discussed within the context of outlining directions for future research.

CHAPTER 2: RESEARCH OBJECTIVES

The original intent of this project was to explore the notion of substitutability of services within the structure of a continuum of care developed for a geriatric services program. Specifically, we were interested in examining how the geriatric day hospital (GDH) fit within the spectrum of services provided. In Canada, GDHs have emerged as part of a continuum of geriatric care services available to older adults. In larger centres with high concentrations of older adults, comprehensive geriatric services include inpatient beds, inpatient consultation-liaison teams, an outpatient clinic, a domiciliary consultation service staffed with trained geriatric specialists and ready access to comprehensive community services. GDH is seen as important for a subset of geriatric patients: those who have multiple problem areas, who require interdisciplinary consultation and care, and for whom there is an expectation that the patient would benefit from outpatient rehabilitation and clinical case management. Persons attend a GDH on an outpatient basis a few days (e.g., 2 or 3) per week for the rehabilitation period (e.g., a prescribed period or until outcomes are achieved). Persons admitted for inpatient rehabilitation most likely differ in the severity and chronicity of their conditions and in the need for medical intervention. Many people admitted to hospital are too frail and do not have the stamina to tolerate a GDH. Within centres where comprehensive geriatric services exist, the value of having a GDH within the complement of other services is of interest. If GDH plays a clearly identifiable role reflected in its effectiveness and cost (e.g., reduced hospitalization, institutionalization, home care costs, cost to family/caregiver), then its role within the continuum of care would be important and justified.

Despite the growing number of GDHs available across the country (Eagle, Guyatt, Patterson, Turpie, Sackett, & Singer, 1991), there is a paucity of information concerning the effectiveness either in terms of health outcomes or cost of these programs. The reasons for this are both practical and conceptual: 1) definitions of GDH vary between studies; 2) studies are rarely able to use random assignment of patients to groups; 3) outcomes vary or are narrowly addressed; and 4) difficulties have existed in the valid measurement of outcomes. In terms of definitions, some studies define

GDHs as day care programs rather than hospital-based medical rehabilitation services. Finding an appropriate comparison group is central to the observation that few randomized controlled trials examine effectiveness in the literature (Eagle et al., 1991) and almost no cost-effectiveness studies have been conducted within Canada. In the literature, a variety of alternatives have been used as comparisons for GDHs. These include: in-patient care (Pathy, 1969; MacFarlane, Collings, Graham & MacIntosh, 1979; Anand, Thomas, Osborne & Osmolski, 1979; Cummings, 1985), community care including medical services (Weissert, 1980), and outpatient management (Tucker, 1984; Eagle et al., 1991). It has also been suggested that, unless they had been in GDH, patients would have required long-term care (Farquhar & Earle, 1981). The variety of comparison groups identified speaks to the complexity of this issue of “appropriate comparison group”. Within the continuum of care developed by the Geriatric Services Department (Geriatrics Services Department Manual, April, 1996), GDH is seen as serving a specific subpopulation that is not effectively dealt with through other components of the continuum. If GDHs were not available, these patients might be managed in a number of different ways through necessity (e.g., hospitalization, institutionalization, out-patient care). This was illustrated in the study by Eagle et al. (1991) where physicians could specify the type of conventional care the patient would receive if assigned to the control group (i.e., “management in the inpatient geriatric assessment unit for comprehensive assessment and treatment, management in the outpatient geriatric clinic, with limited diagnostic and rehabilitative opportunities, or early discharge from the medical-surgical inpatient unit and appropriate community follow-up services” p. 701).

Given that GDHs are established within geriatric care systems, physicians are reluctant to support the randomization of large groups of patients into GDH care and other treatment modes (Donaldson, Wright, & Maynard, 1986). Eagle et al. (1991) were able to accomplish this perhaps because their study took place when the GDH was first opening and referral sources had not yet established expectations for the program. Once a program is established, it is difficult to justify denying appropriate service to patients. In reviewing the literature on cost-effectiveness, Eagle et al. (1987) speculate better outcomes for GDHs as compared to conventional outpatient care. However, costs accrued for such services will be greater unless hospitalization and/or institutionalization, that would otherwise occur, can be avoided. If the GDH is offered in lieu of inpatient medical care and rehabilitation, equivalent outcomes may be expected at a lower cost if the GDH treatment is of relatively short duration (i.e., 2 days per week for 6-8 weeks). These speculations assume substitutability and availability of these programs, that the patients in one program (e.g., inpatient rehabilitation) can be served as adequately through GDHs as through the inpatient unit, and that outcomes may be measured using an appropriate set of standard instruments.

This project, the Geriatric Outcome Evaluation Study (GOES), therefore sought to address the notion of substitutability of services within the structured care provided by a geriatric services program. Specific objectives were to:

- determine if the current program is integrated into a continuum of care by demonstrating differences in health status and health care utilization among patients using different services within the program of care

- evaluate the effectiveness of care for each service and the entire program by measuring changes in health status and health care utilization
- evaluate the cost-effectiveness of each service and the entire program of services
- evaluate the sustainability of gains in health outcomes following discharge from geriatric care.

CHAPTER 3: RESEARCH METHODS

The project was conducted in the Department of Geriatric Services within the CHR of Vancouver Island, British Columbia. This was considered an appropriate location as an established spectrum of services, including a GDH, was ongoing within a single department (Department of Geriatric Services) providing services to a mid-size community (CHR). The CHR includes Victoria, one of Canada's premiere retirement cities. In 1995, almost one-fifth (18.6%) of the region's population was aged 65 and older. The national demographic curve indicates that by the year 2016, a full 15% of the population of Canada will be aged 65 and older. The CHR of British Columbia has already surpassed this figure and is confronting the challenging issues around provision of appropriate health care services for older adults now.

Structured interviews were conducted with all consecutive referrals to the Department of Geriatric Services in the CHR between May 1999 and July 1999. This included all persons being referred for Geriatric Outpatient assessment (GOC) and to the GDH (referred from GOC); Inpatient Geriatric Rehabilitation, (7C refers to postacute geriatric rehabilitation units admitting people from within hospital who have rehabilitation potential; 7D refers to a community geriatric rehabilitation unit-admitted directly from the community) and Homer 2 (H2; Inpatient Psychogeriatric unit) (see Table 1). Approximately one quarter of persons attending the GDH were involved in psychogeriatric rehabilitation. Initially, it was estimated that approximately 90 persons would be recruited from each service (i.e., 180 outpatient; 180 inpatient). It was anticipated that structured interviews would be conducted with these individuals on three occasions: at admission, at discharge and at three months post-discharge. Due to unforeseen circumstances (see Chapter 4) initial interviews were conducted with 177 individuals (see Table 1; 90=GOC, 17 = H2, 53 = 7C/D, 17 =GDH). Only 52 patients were seen at both admission and discharge. Fifty of these patients were followed up four months after discharge (instead of the originally planned three months). Of these, 3 had died and 12 were either lost to follow-up or declined further participation in the study. This resulted in complete sets of data (at three assessment times) for 14 inpatients and 21 outpatients and first assessment data for only 142 cases.

Table 1. Proposed and actual number of participants

	GOC	GDH	H2	7C	7D	Total
Proposed Plan	90	90	60	60	60	360
Actual Admission	90	17	17	25	28	177
Discharge	21	4	0	12	13	50
Follow up	18	3	0	9	5	35

Through the structured interviews, all respondents were asked for descriptive and factual information on background characteristics, health status, and service utilization. A number of measures of health status were administered (see Table 2). These same measures were re-administered each time the participant was seen. In addition, in cases where a supportive family member was involved with the care of the participant, s/he was recruited to participate in the study. These supportive persons ($N=133$) were asked for descriptive and factual information on their background characteristics, and for service utilization and costs incurred in supporting the care of the participant. They were also administered measures to assess their health and functional status (see Table 3). These same measures were administered to the supportive person each time the participant was seen.

It was anticipated that additional data on health care utilization and costs of care would be obtained through existing administrative databases, manual record review, and report of caregivers. Cost effectiveness should not only measure the monetary costs of the various programs and services provided, but the benefit of the service for meeting patient needs and health outcomes. For the purposes of the GOES study the cost component included the services provided by the Department of Geriatric Services and the following alternate forms of care:

- self care
- informal caregivers - family members, friends, association members, community volunteers.
- formal care purchased - by the patient or their families including private insured service providers and directly purchased services.
- formal care government services /co-paid by patients - home care, extended care and long term care facilities.
- formal care government services - geriatric care programs-outpatient, day hospital, inpatient (evaluated through GOES project) and acute care. Measuring service needs, services provided, identifying costs, quantifying costs for non-paid labour, and the ability to compare services were the major challenges to determine the cost effectiveness of GOES study services.

Table 2. Health status measures administered to participants

Domain	Measure
Mental Health	<p>Geriatric Depression Scale (short form) (GDS; Sheikh & Yesavage, 1986). Range = 1 to 15 (depressed).</p> <p>Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983; Wattis, Davies, Burn, McKenzie, & Brothwell, 1994). Range = 0 (better mental health) to 42 (lower mental health).</p> <p>Modified Mini-Mental State Examination (Teng & Chiu, 1987). Higher score = better mental health (range: 0 - 100).</p> <p>Mini-Mental State Examination (Folstein, Folstein & HcHugh, 1975). Higher score = better mental health (range: 0 - 30).</p> <p>Role-Emotional and Mental Health subtests from the Short Form-36 (Ware & Sherbourne, 1992). High score = better mental health.</p>
Physical Health	<p>Berg Balance Scale (Berg, Wood-Dauphinee, Williams & Gayton, 1989). Range = 0 (low) to 4 (high).</p> <p>Timed Up and Go (Podsiadlo & Richardson, 1991). Time in seconds.</p> <p>General Health and Vitality subtests from the Short Form-36 (Ware & Sherbourne, 1992). High score = better physical health.</p>
Daily Functioning	<p>Barthel Index (Mahoney & Barthel, 1965). Range = 0 (dependent) to 2/3 (independent).</p> <p>ALSAR (Williams, Drinka, Greenberg, Farrell-Holtan, Eugardy & Schram, 1991). Task risk score: range = 0 (low) to 4 (high).</p> <p>Physical Functioning, Role-Physical, Social Functioning subtests from the Short Form-36 (Ware & Sherbourne, 1992). High score = better daily functioning.</p>
Pain	<p>Vertical Visual Analog Scale for Pain (Scott & Huskisson, 1976). Range = no pain to worst pain.</p> <p>Bodily Pain subtest from the Short Form-36 (Ware & Sherbourne, 1992). High score = no pain.</p>

Table 3. Health status measures administered to caregivers

Measure
SF36 Health Survey (Ware & Sherbourne, 1992). See Table 2.
Caregiver Reaction Assessment (Given, King, Collins, & Given, 1998; Given, Given, Stommel, Collins, King, & Franklin, 1992). Higher values indicate more negative reactions.
Centre for Epidemiologic Studies of Depression Scale (CES-D) (National Institute on Mental Health, 1972). Higher scores indicate a greater likelihood of experiencing depression.

The evaluation of each patient by GOES staff and by the inpatient and outpatient teams (as described elsewhere in this document) determined the services to meet the needs at the point of entry into the GOES project. The patient status and the services provided by caregivers were documented at the time of first admission (patient and caregiver demographic forms), tracked while the patient stayed in the service up to the point of discharge, and re-evaluated again at four months post-discharge.

For inpatients, the services provided and costs incurred were tracked through audit of the patient charts and the costing of services provided (Appendix 1). It was the GOES project plan to match the costing at discharge to the battery of tests administered at discharge. Administrative sources for collection of information on costs of care are contained in Appendix 2.

For outpatients, the method for tracking costs at admission, discharge and at follow up was to use a caregiver report (Appendix 3). The caregiver would record time spent on household and transport, health care, personal care and any money spent on food, medical supplies, pharmacy, and other expenses to provide care to the patient (see Chapter 5, Objective 4).

CHAPTER 4: CHALLENGES ENCOUNTERED

During the data collection phase of the study, the GOES team was faced with certain challenges that ultimately led to the decision to reduce the sample sizes for the various components of the study.

The first challenge involved the amount of time required to collect the information necessary to adequately address the objectives. The time required for completion of assessments improved from the first month (May) with an average of 7.3 hours per assessment (training time included) to 4.0 hours by July. However, the budget allowed for 1.5 hours per assessment. Additional funds were sought from other sources to allow the project to be completed despite the initial underestimate for assessment time.

The second challenge, which ultimately led to the reduction in sample size, was the restructuring of the outpatient programs (GOC and GDH). The public announcement of the plans to restructure this service was made in July 1999. Although the date for the restructuring to be completed was Oct. 1, 1999, the announcement may have led to a diversion of patients to waiting lists, and to other services that were part of the GOES project (e.g., 7C/D and H2). This diversion of what would have been new GOC patients could have created a dilution of 50% or more of the patients in the remaining service areas, as the number of GOC patients equaled all of the other four services combined.

Due to this restructuring, it was not possible to complete a meaningful cost-effectiveness analysis for at least three reasons:

1. Reduced number of potential subjects: The number of patients completing the study was reduced, from 360 to 50 because of the restructuring. Data collection had to be stopped after the announcement of the restructuring because patients who had been attending the outpatient programs (i.e., GOC/GDH) may have been placed in the remaining three programs or other programs in the region. The number 50 was possible because 25 outpatients and 25 inpatients completed the discharge assessment before the program restructuring took effect. Only 35 of the 50 completed the follow-up assessment.
2. Restructuring of alternative services available within the CHR: As part of cost effectiveness analysis, the programs in the study, and particularly GDH, were to be compared to other programs available in the CHR that could have provided a substituted service (i.e., home care) Restructuring of the main alternative program in the community (i.e., home care) was ongoing thereby making the cost comparisons impossible at the time this project was underway. The cost cutting happened at the same time that home care service territories changed, provider agencies changed, some two thirds of staff changed patients and eligibility rules changed.
3. Restructuring of services in the review: The costing of the GOC and GDH services would have changed with the service restructuring, the cost per service would have changed and the quality and types of service changed.

For these reasons, it was necessary to stop data collection before we could obtain the sample size necessary to address the original objectives. As a result of this decision, the data collection was restricted as illustrated in Table 1. The original design called for 360 patients (180 inpatient, 180 outpatient) to have three complete assessments (at admission, at discharge, 3 months post-discharge). Only 50 were seen at both admission and discharge and of these, 35 were seen at follow-up (4 months post-discharge).

The original goals and objectives of the project were evaluated but, due to the reduced sample sizes, these evaluations must be viewed with caution. However, given the amount of data collected, there is much to be learned. For example, it is possible to describe and compare persons attending the various services within the program. In addition, many valuable lessons were learned in

conducting this study and we were able to document the impact of restructuring on a study in progress (Appendix 4).

CHAPTER 5: RESEARCH FINDINGS

***Objective 1:** determine if the current services are integrated into a continuum of care by demonstrating differences in health status and health care utilization among patients using different services with the program of care*

Comparisons among services

To examine this objective, the people in each service at admission were compared on the measures of: mental health, physical health, daily functioning and bodily pain. The groups ranged in size from 17 (GDH and H2) to 90 (GOC). In cases where a supportive family member was involved with the care of the participant, comparisons were made between service groups on the health and functional status of these supportive persons.

Given that comparisons were being made between the groups on a number of dependent measures (n=20), a Bonferroni adjustment was used to protect against making a type 1 error ($20/.05 = .0025$). For post-hoc comparisons, the Scheffe procedure was used with a p-value of .1. All reported differences between groups are those that reached this level of statistically significant difference.

A legend listing the labels denoting services and measures reported in tables and figures may be found in Table 4.

Mental Health

As can be seen in Figure 1 and Table 5, persons entering the various services differed on some mental health variables. As was expected, H2 patients reported more symptoms of anxiety as measured by the Hospital Anxiety and Depression Scale (GDS; $p < .000$) than patients attending the GOC and 7C but did not report more symptoms of anxiety than persons attending the other services. (i.e., GDH, 7D). In addition, H2 patients reported having worse health as compared to persons in all other services except 7D on the Mental Health subscale of the SF-36. The participants in each service did not differ significantly on measures of depression (GDS, HAD-D) and did not report more disruption of everyday life due to emotional problems (SF36-E). In terms of cognitive functioning (see Figure 1), no differences between the services was observed on either the 3MS or the MMSE.

Table 4. Legend for tables and figures

Label	Description
GDS	Geriatric Depression Scale
HAD	Hospital Anxiety and Depression Scale
3MS	Modified Mini-Mental State Exam
MMSE	Mini-Mental State Exam
SF36-E	Role-Emotional
SF36-MH	Mental Health
BERG	Berg Balance Scale
TUG	Timed Up and Go
SF36-GH	General Health
SF36-V	Vitality
ALSAR	Assessment of Living Skills and Resources
BARTHEL	Barthel Index
SF36-PF	Physical Functioning
SF36-P	Role-Physical
SF36-SF	Social Functioning
VVA	Vertical Visual Analogue Scale for Pain
SF36-BP	Bodily Pain
H2	Homer 2
GDH	Geriatric Day Hospital
7C/7D	Inpatient Geriatric Rehabilitation
GOC	Geriatric Outpatient Clinic

CRA1	Caregiver Reaction Assessment: Impact on schedule
CRA2	Caregiver Reaction Assessment: Caregiver esteem
CRA3	Caregiver Reaction Assessment: Lack of family support
CRA4	Caregiver Reaction Assessment: Impact on health
CRA5	Caregiver Reaction Assessment: Impact on finances
CES-D	Centre for Epidemiologic Studies of Depression Scale

Figure 1. Performance of participants in each service on measures of mental health.

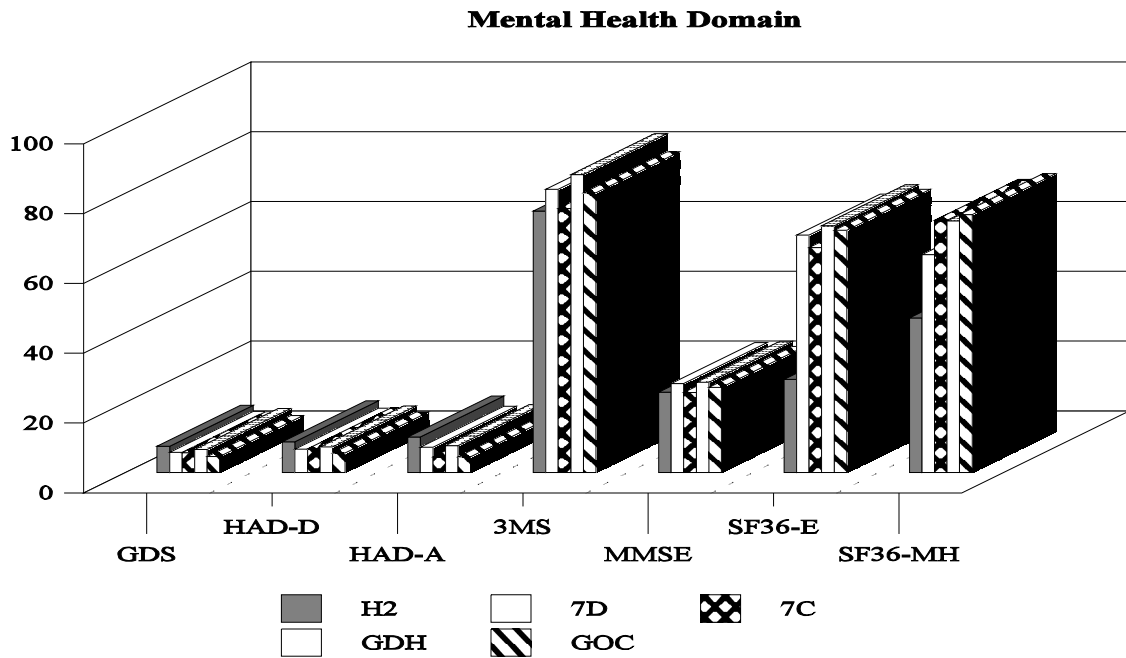


Table 5. Means and standard deviations (in brackets) for the performance of participants in each service on measures of mental health

	<u>Services</u>				
	H2	7D	7C	GDH	GOC
GDS	7.5 (4.4)	5.7 (3.5)	5.6 (3.6)	6.6 (2.4)	4.6 (3.6)
HAD-D	8.8 (6.4)	6.6 (4)	6.7 (4.3)	7.3 (3.2)	5.5 (3.8)
HAD-A	10.1 (6.4)	7.2 (4.5)	4.4 (4.3)	7.7 (5.5)	4.5 (3.7)
3MS	74.8 (14.2)	81.1 (13.4)	75.6 (12.3)	85.3 (7.2)	80.1 (16)
MMSE	23 (4.7)	25.4 (3.5)	22.9 (3.9)	25.8 (2.1)	24.4 (5.2)
SF36-E	26.7 (42.2)	68 (45.6)	64.4 (46.5)	70.6 (40.6)	69.3 (41.1)
SF36-MH	44.3 (34.1)	62.4 (23.5)	72.2 (25.5)	72 (16.7)	73.8 (21.4)

Physical Health

When the persons in each service were compared with respect to physical health (see Figure 2, Table 6), it appeared that persons in 7C performed very poorly on a measure of balance (i.e., Berg Balance Scale) in relation to persons in all other services. Moreover, persons in 7D performed more poorly than those in the GOC on this measure of balance. Of note, very few persons on 7C were able to perform the Timed Up and Go (TUG) tasks. All service groups performed well outside the “normal” range (less than 10 seconds considered normal) but the groups did not differ on TUG tasks. Persons attending the GDH reported themselves as being in poorer health with a poorer prognosis than persons attending the other services (i.e., SF36-GH). The participants in the various services did not differ with respect to their self-reported level of energy (i.e., SF36-V).

Figure 2. Performance of participants in each service on measures of physical health.

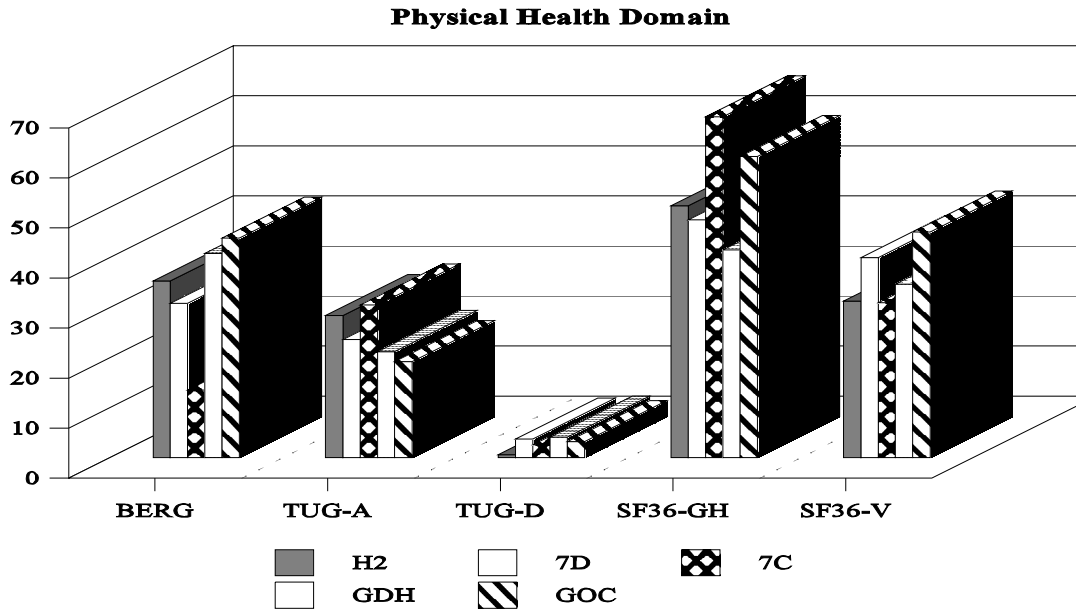


Table 6. Means and standard deviations (in brackets) for the performance of participants in each service on measures of physical health.

	<u>Services</u>				
	H2	7D	7C	GDH	GOC
BERG	35.3 (19.4)	30.9 (17.8)	13.5 (13)	40.8 (6.8)	43.9 (11.1)
TUG-A	28.4 (31.4)	23.6 (12.36)	30.5 (33.23)	21.2 (6.21)	19.2 (13.14)
TUG-D	.6 (5.3)	3.7 (6.8)	1.6 (.8)	4.1 (4.2)	3.2 (4.8)
SF36-GH	50.3 (26.9)	47.5 (19.7)	68.1 (17.2)	41.5 (24.3)	60.2 (23.6)
SF36-V	31.3 (29.6)	40 (24.6)	31 (23.5)	34.7 (20.8)	45.1 (27.2)

Daily Functioning

When the persons in each service were compared with respect to daily functioning (see Figure 3, Table 7), the GOC patients were viewed as at less risk than those attending inpatient services (7C, 7D, H2). Persons in H2 were viewed to be at greatest risk and differed from persons attending the GDH and 7C. The outpatients (GOC and GDH) were more independent in terms of activities of daily living as measured by the Barthel Index than the inpatients. Within the inpatient units, persons on 7C were less independent in terms of activities of daily living measured by the Barthel Index than persons on the other units. Those on H2 and 7D did not differ. On the SF-36, persons attending the GOC reported fewer limitations in physical functioning (including bathing or dressing) due to health than those in 7C, 7D, or GDH (i.e., SF36-PF). Similarly, those attending GOC reported fewer problems with work or other daily activities than persons in 7C or 7D and less interference in normal social activities due to physical or emotional problems than those attending the inpatient units (SF36-SF).

Figure 3. Performance of participants in each service on measures of daily functioning.

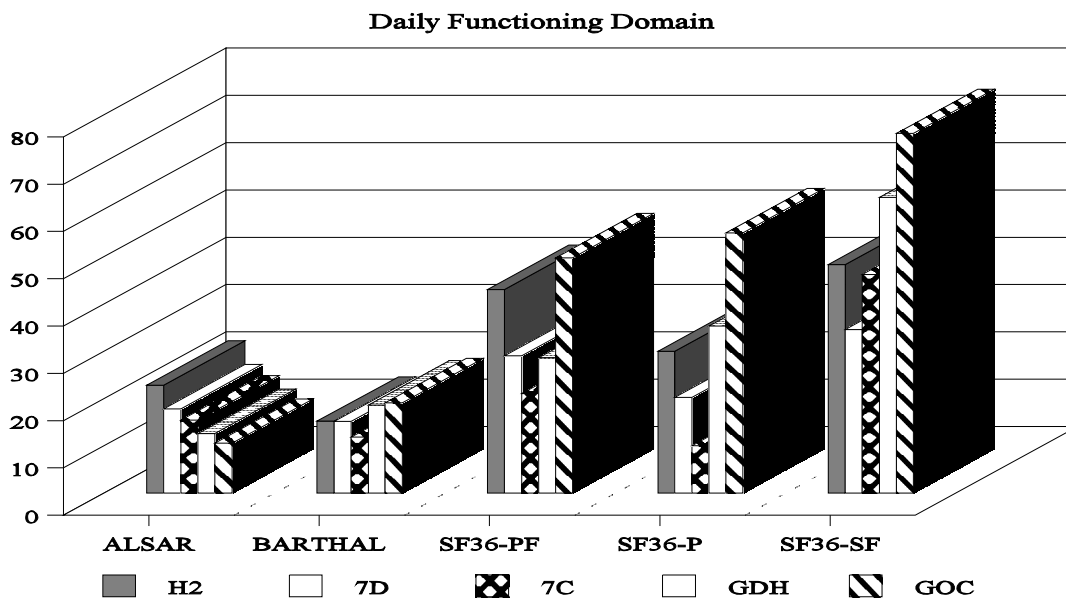


Table 7. Means and standard deviations (in brackets) for the performance of participants in each service on measures of daily functioning

	<u>Services</u>				
	H2	7D	7C	GDH	GOC
ALSAR	22.8 (10.4)	17.8 (6.4)	15.4 (5.2)	12.6 (4.9)	10.5 (8.1)
BARTHEL	15.2 (5.8)	15.1 (5)	11.8 (3.3)	18.6 (1.3)	19.1 (1.4)
SF36-PF	43 (35.3)	29 (27.8)	21 (16.5)	28.6 (25.2)	49.7 (29.5)
SF36-P	30 (45.5)	20.2 (34.7)	10 (22.8)	35.3 (41.5)	55 (42.3)
SF36-SF	48.3 (33.4)	34.6 (30.1)	46.2 (29.8)	62.5 (37.4)	76 (30.9)

Bodily Pain

The persons attending GOC reported far less pain as measured by the Vertical Visual Analog Scale for Pain than persons attending inpatient services (see Figure 4, Table 8). Similarly the GOC patients reported less pain than those in 7D on the SF-36.

Caregivers

Among caregivers of persons entering various services, no differences were observed on multidimensional measures of mental and functional health (SF-36, CRA, CES-D) (see Table 9).

Comparisons between outpatients and inpatients

When the services were collapsed into outpatient and inpatient services, no differences were observed on the measures of mental health (see Figure 5, Table 10). Outpatients performed better than inpatients on the physical health measure of balance (i.e., Berg) (see Figure 6, Table 11). Similarly, outpatients were more independent in their daily functioning than inpatients on the Barthel Index and were at less risk as measured by the ALSAR (see Figure 7, Table 12). On the SF-36, outpatients reported fewer limitations in performing physical, daily, and social activities than inpatients (i.e., SF36-PH, SF36-P, SF36-SF). Outpatients reported less pain than inpatients on both self-report measures of pain (VVA, SF36) (see Figure 8, Table 13).

Figure 4. Performance of participants in each service on measures of bodily pain.

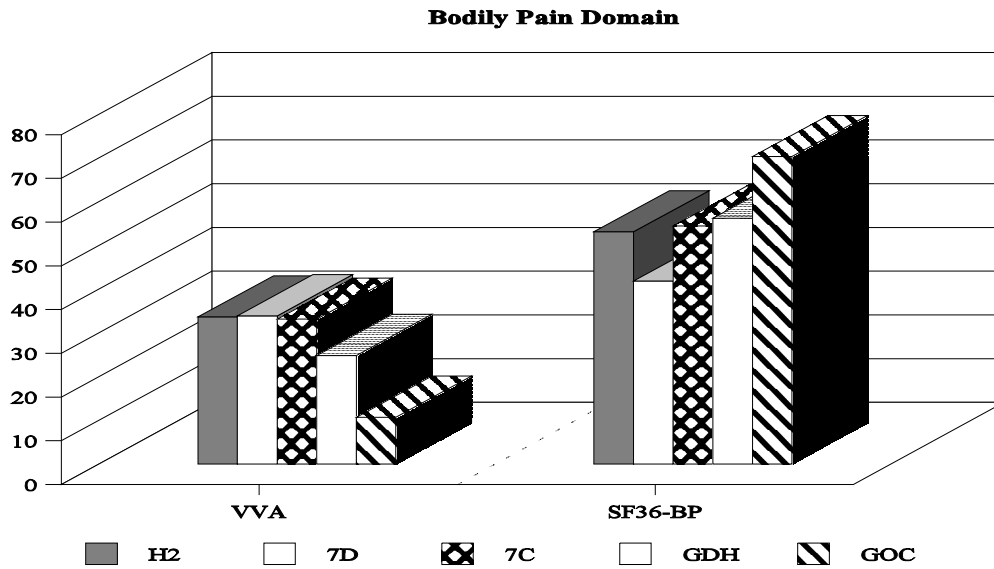


Table 8. Means and standard deviations (in brackets) for the performance of participants in each service on measures of bodily pain

	<u>Services</u>				
	H2	7D	7C	GDH	GOC
VVA	33.6 (28.6)	33.9 (30.9)	33.1 (33.1)	24.8 (26)	10.7 (19.7)
SF36-BP	53.1 (38.2)	41.8 (31.8)	54.4 (30.8)	56.2 (33.2)	70.3 (29.8)

Table 9. Means and standard deviations (in brackets) for the performance of caregivers of participants in each service

	<u>Services</u>				
	H2	7D	7C	GDH	GOC
SF-36 PF	74.2 (27.4)	77 (21.1)	85.6 (17.4)	85.4 (23.4)	83.5 (22.4)
SF-36 RP	66.7 (44.4)	70 (38.6)	82.4 (36.2)	78.6 (36.5)	81.6 (31.1)
SF-36 BP	70.3 (27.1)	81.6 (21.3)	73.4 (35.2)	72.1 (29.1)	77.1 (25.6)
SF-36 GH	78.3 (19.3)	67.4 (17.9)	76.5 (17.2)	71.7 (14.3)	76.1 (20.9)
SF-36 V	54.2 (27.9)	50.8 (28.3)	65 (25.1)	55.7 (21.6)	56.9 (22.6)
SF-36 SF	76 (30.4)	78.8 (30.9)	83.3 (29.4)	93.8 (11.8)	87.2 (24)
SF-36 RE	69.4 (46)	64.9 (43.7)	96.1 (16.2)	90.5 (27.5)	81.2 (33.7)
SF-36 MH	68.4 (26.1)	76.4 (15.6)	77.9 (14.4)	80.9 (12.5)	82.4 (18.1)
CRA-1	15.2 (5.5)	14.9 (5.3)	15.9 (3.2)	15.1 (5.3)	12.4 (5.1)
CRA-2	25.7 (5.7)	27.2 (5.1)	27.6 (3.4)	26.6 (5.3)	28.4 (5.2)
CRA-3	10 (4.3)	9.8 (3.1)	12.9 (3.6)	11.3 (4)	10.1 (3.8)
CRA-4	9.9 (4.2)	10.1 (3.3)	9 (2.1)	8.2 (2.6)	7.8 (3.5)
CRA-5	5.5 (2.3)	6.3 (1.8)	7.1 (2.7)	6.7 (2.8)	5.4 (2.3)
CES-D	10 (10)	9.5 (7.1)	6.6 (6)	8.7 (6.9)	6.6 (7.9)

Figure 5. Performance of inpatients and outpatients on measures of mental health.

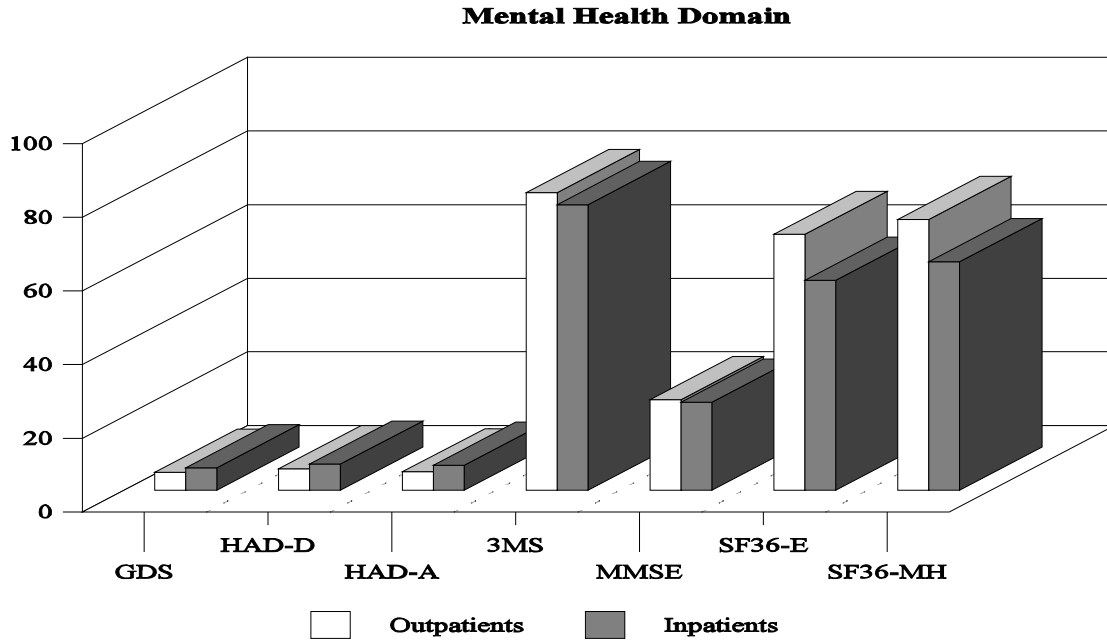


Table 10. Means and standard deviations (in brackets) for the performance of inpatients and outpatients on measures of mental health

	Inpatients	Outpatients
GDS	6.1 (3.8)	4.9 (3.5)
HAD-D	7.1 (4.7)	5.8 (3.8)
HAD-A	6.8 (5.3)	5 (4.2)
3MS	77.6 (13.3)	80.9 (15.1)
MMSE	23.9 (4.1)	24.6 (4.8)
SF36-E	57 (47.6)	69.5 (40.9)
SF36-MH	62.1 (28.4)	73.5 (20.6)

Figure 6. Performance of outpatients and inpatients on measures of physical health.

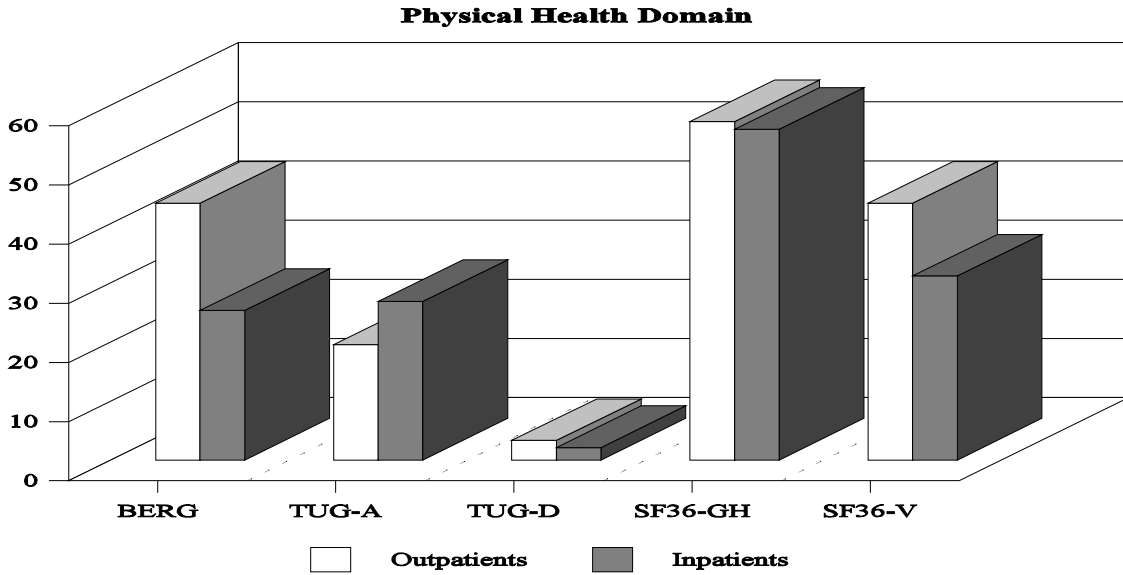


Table 11. Means and standard deviations (in brackets) for the performance of inpatients and outpatients on measures of physical health

	Inpatients	Outpatients
BERG	25.3 (18.9)	43.4 (10.6)
TUG-A	26.8 (24.8)	19.5 (12.4)
TUG-D	2.2 (5.8)	3.3 (4.7)
SF36-GH	55.9 (22.6)	57.2 (24.6)
SF36-V	31.1 (25)	43.4 (26.5)

Figure 7. Performance of outpatients and inpatients on measures of daily functioning.

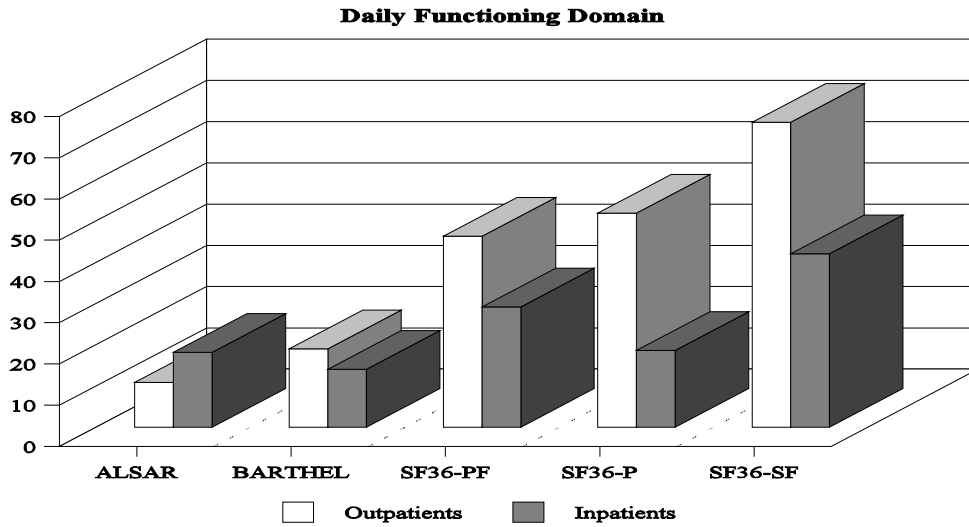


Table 12. Means and standard deviations (in brackets) for the performance of outpatients and inpatients on measures of daily functioning

	Inpatients	Outpatients
ALSAR	18.1 (7.6)	10.8 (7.7)
BARTHEL	13.9 (4.9)	19 (1.4)
SF36-PF	29.1 (27.2)	46.3 (29.8)
SF36-P	18.6 (34.1)	51.9 (42.6)
SF36-SF	42 (30.9)	73.9 (32.1)

Figure 8. Performance of outpatients and inpatients on measures of bodily pain.

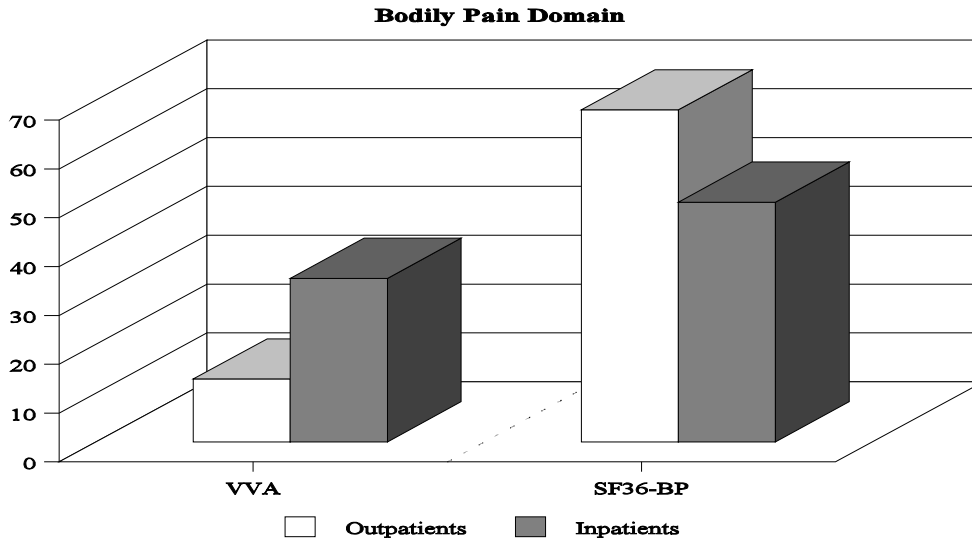


Table 13. Means and standard deviations (in brackets) for the performance of inpatients and outpatients on measures of bodily pain

	Inpatients	Outpatients
VVA	33.5 (30.7)	12.9 (21.3)
SF36-BP	49.1 (33.1)	68 (30.6)

Caregivers

Caregivers of inpatient and outpatient services did not differ on any measures (e.g., SF-36, CRA, and CES-D) (see Table 14).

Objective 2: evaluate the outcome effectiveness of care for each program and the entire service by measuring changes in health care status and health care utilization

Table 14. Means and standard deviations (in brackets) for the performance of caregivers of inpatients and outpatients on a battery of measures.

	<u>Services</u>	
	Inpatients	Outpatients
SF-36 PF	79.3 (21.7)	83.8 (22.4)
SF-36 RP	73.5 (39)	81.1 (31.8)
SF-36 BP	76 (28)	76.3 (26.1)
SF-36 GH	73.2 (18.3)	75.4 (20)
SF-36 V	56.7 (27.3)	64.2 (22.7)
SF-36 SF	79.5 (29.8)	88.2 (22.6)
SF-36 RE	77.1 (39)	82.7 (32.8)
SF-36 MH	75.1 (18.2)	82.2 (17.3)
CRA-1	15.3 (4.7)	12.8 (5.2)
CRA-2	26.9 (4.8)	28.1 (5.2)
CRA-3	10.8 (3.8)	10.3 (3.8)
CRA-4	9.7 (3.3)	7.8 (3.4)
CRA-5	6.3 (2.3)	5.6 (2.4)
CES-D	8.7 (7.6)	6.9 (7.7)

Since only 50 people completed the second assessment before the program restructuring took effect, it was not possible to examine the effectiveness for each program. The programs were collapsed into inpatient and outpatient programs and change, while receiving service, was examined. Given the very small sample size, the results of these analyses must be viewed with caution.

Repeated measures ANOVAs were used to compare inpatient and outpatient groups over time on a battery of measures reflecting the domains of mental health, physical health, daily functioning, and bodily pain.

Mental Health

Both inpatient and outpatient groups reported better mental health at discharge as measured by the Mental Health subscale of the SF-36 (see Figures 9-10, Table 15). Both groups reported less depression and better cognitive functioning at discharge as measured by the HADS and MMSE, respectively.

Figure 9. Change in mental health among inpatients from admission to discharge.

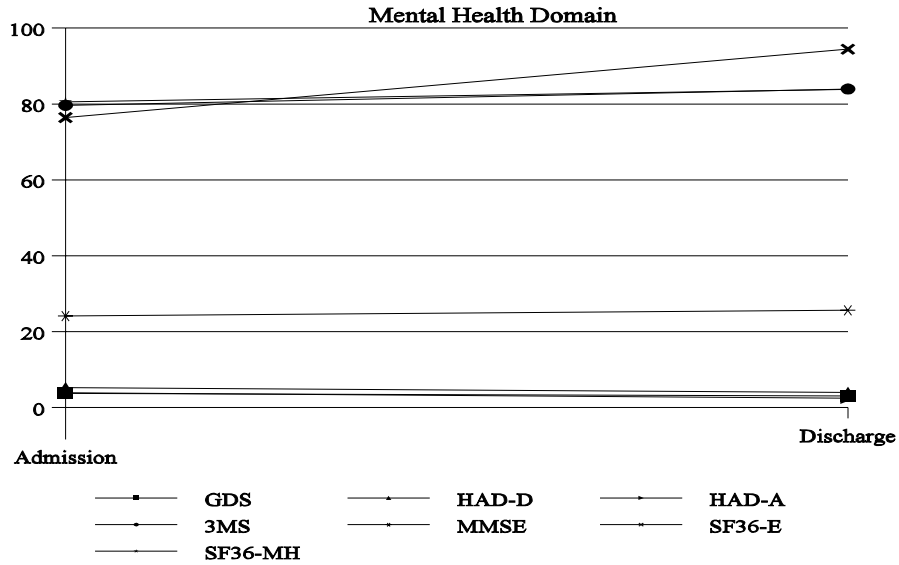


Figure 10. Change in mental health among outpatients from admission to discharge.

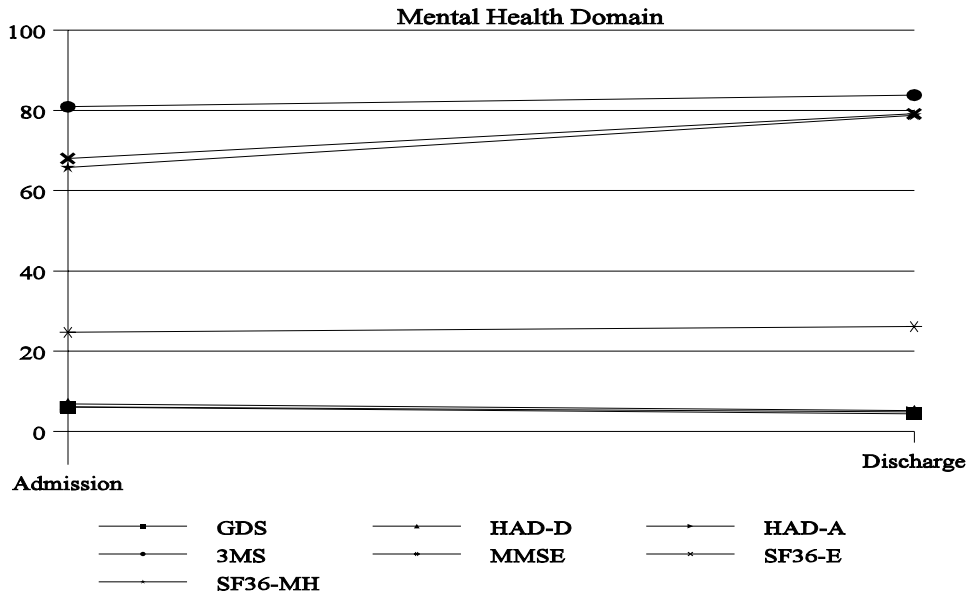


Table 15. Means and standard deviations (in brackets) for change in mental health among inpatients and outpatients from admission to discharge

	Admission		Discharge	
	Inpatients	Outpatients	Inpatients	Outpatients
GDS	6.0 (3.8)	3.8 (2.7)	4.4 (2.6)	3.1 (2.5)
HAD-D	6.9 (4.3)	5.3 (3.5)	5.2 (3.5)	4 (3.2)
HAD-A	6.1 (5.8)	3.9 (3.2)	4.8 (4.4)	2.5 (2.8)
3MS	80.9 (12.2)	79.6 (14.7)	83.8 (13.7)	84 (14.7)
MMSE	24.7 (3.8)	24.1 (4.3)	26.1 (4)	25.7 (4.3)
SF36-E	68.1 (43.4)	76.4 (37.4)	79.2 (41.5)	94.5 (21.2)
SF36-MH	65.7 (30.2)	80.5 (17.4)	78.8 (23.1)	83.8 (18.3)

Physical Health

When inpatient and outpatient groups were compared with respect to physical health, both groups reported better physical health at discharge than at admission as measured by the General Health subscale of the SF-36 (see Figures 11-12, Table 16).

Daily Functioning

Daily functioning improved at discharge for inpatient and outpatient groups as measured by the Role-Physical and Social Functioning subscales of the SF-36 (see Figures 13-14, Table 17). This suggests that improvements were found with respect to work and daily activities.

Bodily Pain

Both inpatients and outpatients reported less bodily pain as measured by the Bodily Pain subscale of the SF-36 from admission to discharge (see Figures 15-16, Table 18).

Figure 11. Change in physical health among inpatients from admission to discharge.

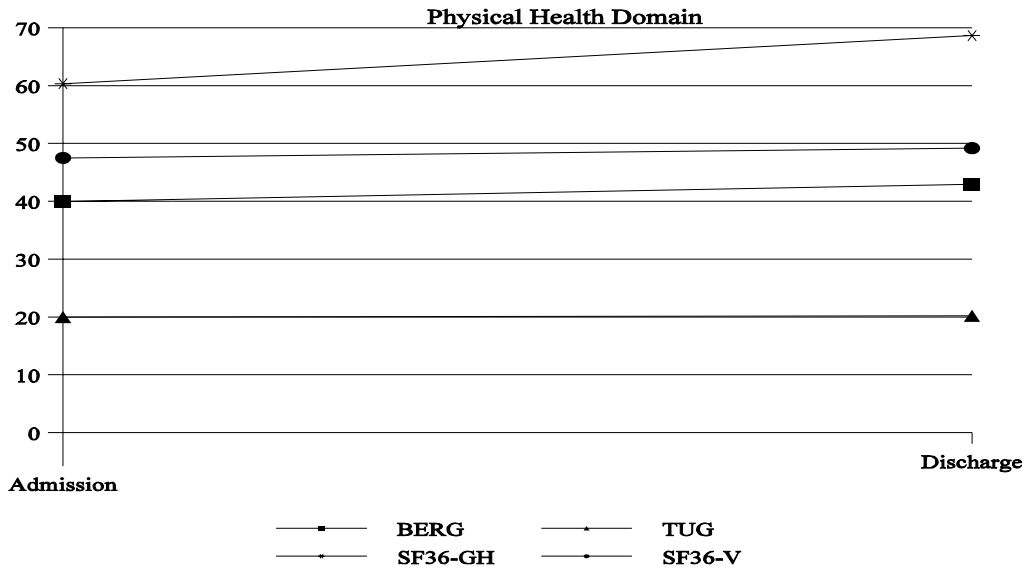


Figure 12. Change in physical health among outpatients from admission to discharge.

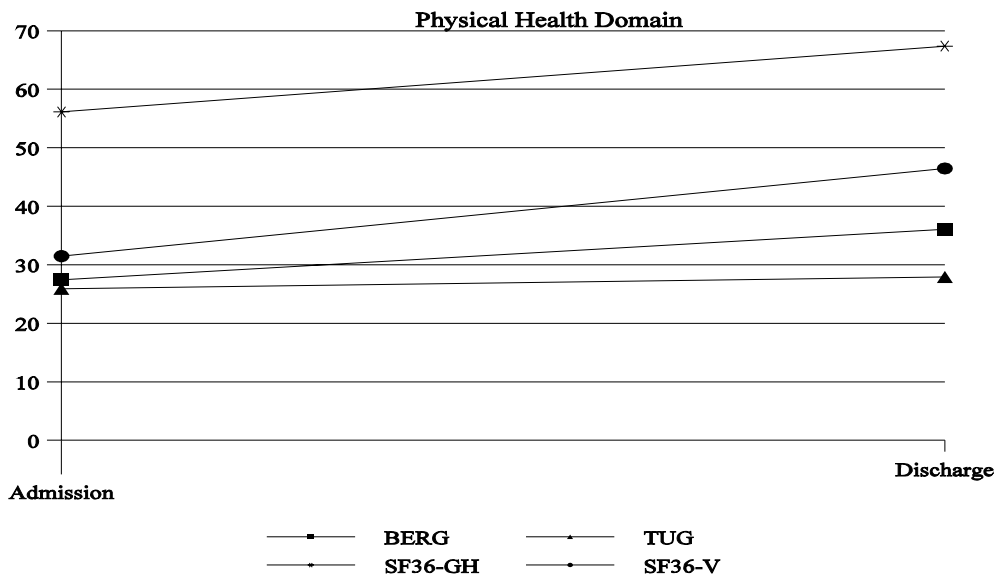


Table 16. Means and standard deviations (in brackets) for change in physical health among inpatients and outpatients from admission to discharge

	Admission		Discharge	
	Inpatients	Outpatients	Inpatients	Outpatients
BERG	27.4 (17.2)	40 (12.5)	36 (14.7)	43 (9)
TUG	25.9 (26.9)	20 (8.1)	27.9 (49.9)	20.2 (9.1)
SF36-GH	56.1 (19.2)	60.3 (22.5)	67.4 (19.8)	68.7 (21.9)
SF36-V	31.5 (21.9)	47.5 (23.2)	46.5 (21.6)	49.2 (23)

Figure 13. Change in daily functioning among inpatients from admission to discharge.

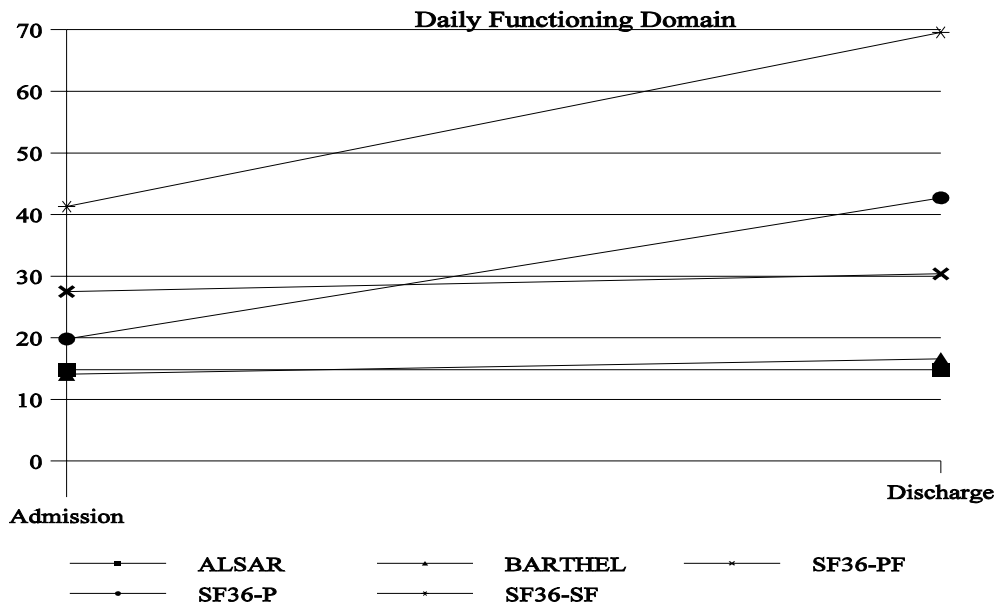


Figure 14. Change in daily functioning among outpatients from admission to discharge.

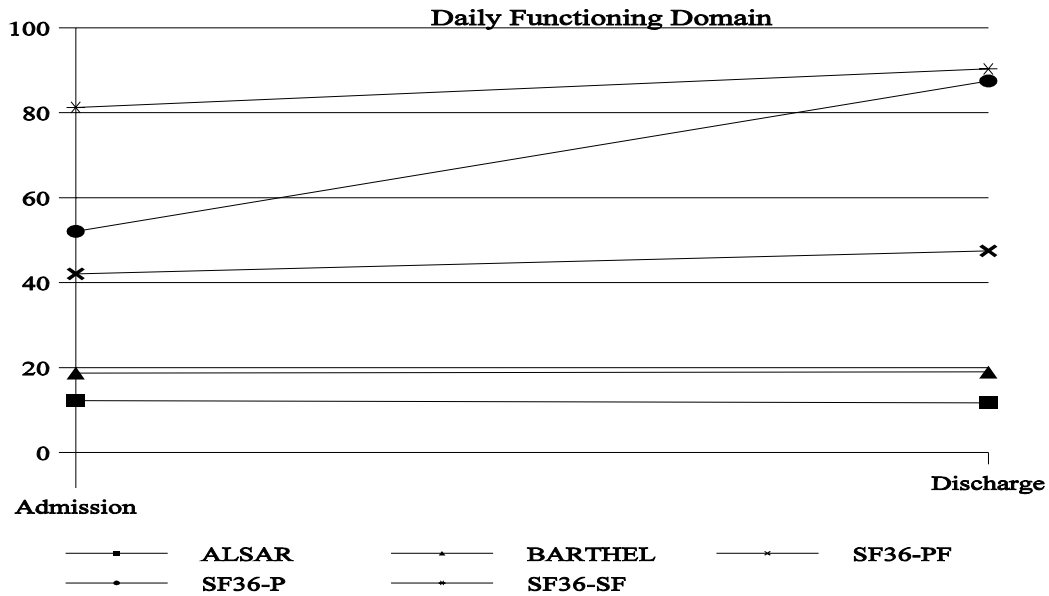


Table 17. Means and standard deviations (in brackets) for change in daily functioning among inpatients and outpatients from admission to discharge.

	Admission		Discharge	
	Inpatients	Outpatients	Inpatients	Outpatients
ALSAR	14.8 (5.3)	12.2 (7.8)	14.8 (5.3)	11.7 (6)
BARTHEL	14.1 (4.2)	18.7 (1.4)	16.6 (4.9)	19 (1.1)
SF36-PF	27.5 (21.5)	42.1 (28.6)	30.4 (23.1)	47.5 (26.5)
SF36-P	19.8 (31.3)	52.1 (41)	42.7 (43.9)	87.5 (28.6)
SF36-SF	41.3 (29.1)	81.3 (27.8)	69.6 (30.3)	90.3 (26.1)

Figure 15. Change in bodily pain among inpatients from admission to discharge.

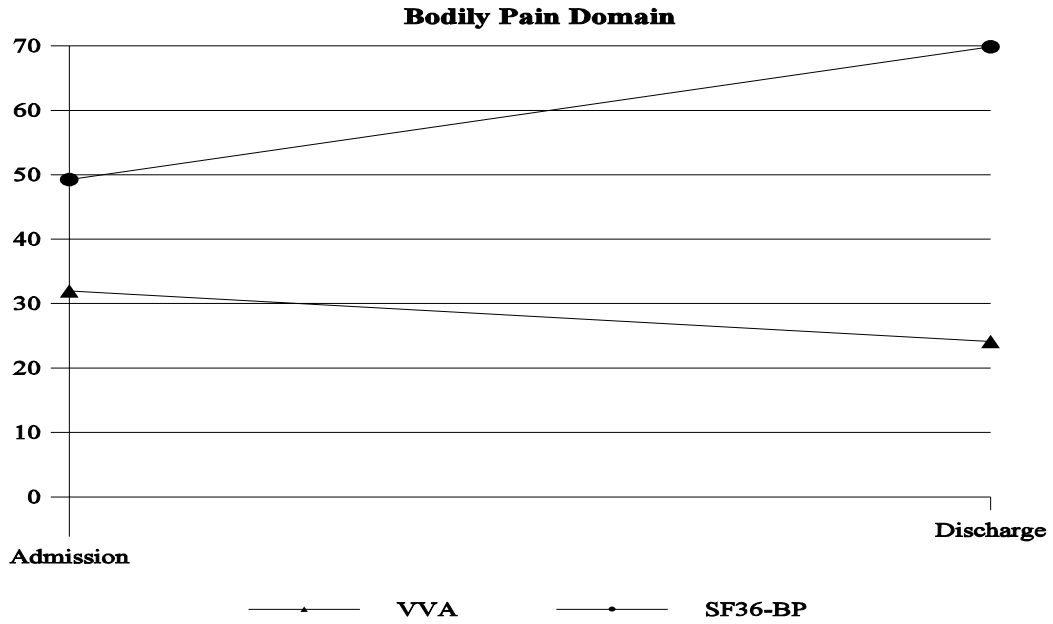


Figure 16. Change in bodily pain among outpatients from admission to discharge.

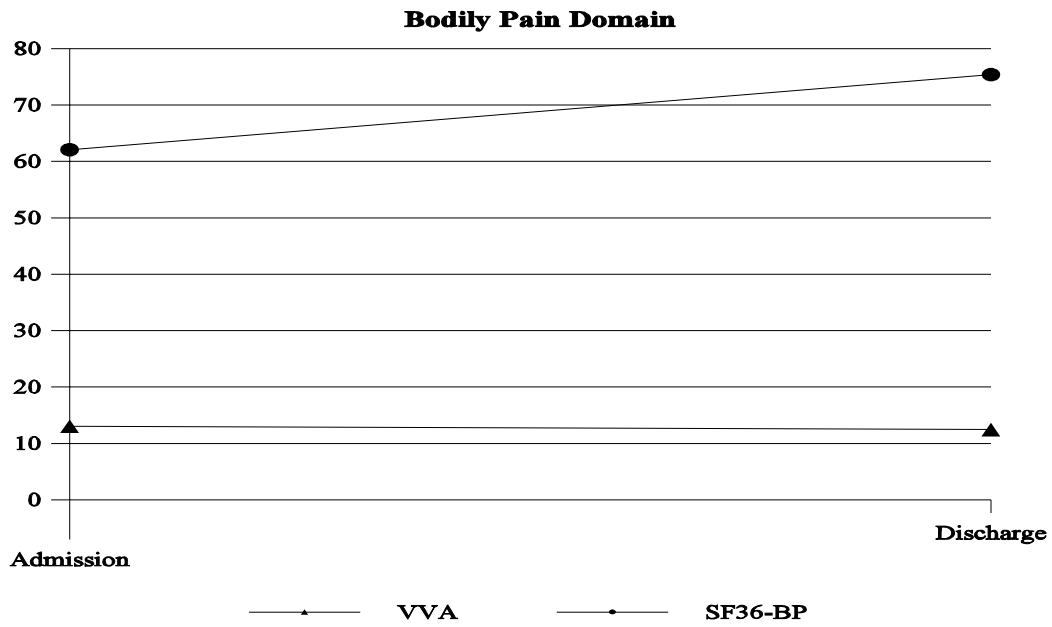


Table 18. Means and standard deviations (in brackets) for change in bodily pain among inpatients and outpatients from admission to discharge

	Admission		Discharge	
	Inpatients	Outpatients	Inpatients	Outpatients
VVA	32 (34.1)	13 (22.9)	24.2 (27)	12.5 (22.5)
SF36-BP	49.3 (33.2)	62.1 (32)	69.9 (23.8)	75.4 (27)

Caregivers

When caregivers of inpatients and outpatients were compared on a battery of measures, no significant changes (i.e., decline or improvement) were observed from admission to discharge (e.g., SF-36, CRA, and CES-D) (see Table 19).

Objective 3: evaluate the sustainability of gains in health outcomes following discharge from geriatric care.

As noted earlier, reduction of sample sizes made examination of this objective tenuous. When the services were collapsed into inpatient and outpatient programs, change after discharge from service was examined. Given the very small sample size, the results of these analyses must be viewed with caution. Of further note, the participants were revisited 4 months after discharge, instead of 3 months post-discharge as originally planned. By extending the follow-up interval, it is possible that more cases were lost to follow-up. It is unclear whether expectations of patient functioning would differ across these intervals. However, it was assumed that maintenance of health outcomes over the longer interval would give equally strong support for the hypothesis.

Mental Health

When outpatients and inpatients were compared on measures of mental health from discharge to four months post-discharge, both out- and in-patients showed significantly more symptoms of depression on the Geriatric Depression Scale at 4 months post-discharge (see Figures 17-18, Table 20). The mean change in GDS score was approximately 1 point with the outpatient mean falling within the “normal” range and the inpatient mean falling within the range suggestive of “mild depression”. This suggests that although the increase in symptoms of depression was statistically significant, the clinical significance of the change is unclear.

Table 19. Means and standard deviations (in brackets) for caregivers of inpatients and outpatients from admission to discharge

	Admission		Discharge	
	Inpatients	Outpatients	Inpatients	Outpatients
SF-36 PF	88.2 (12)	79.5 (22.8)	83.2 (20.4)	79.5 (24.5)
SF-36 RP	80.4 (35.6)	71.3 (36.5)	83.9 (30.4)	90 (27.4)
SF-36 BP	85.9 (30)	69.2 (32.6)	70.5 (23.9)	85.9 (21.2)
SF-36 GH	76.2 (17.3)	67.8 (23.8)	76.6 (22.7)	67.7 (25.4)
SF-36 V	66.8 (29.4)	60 (25.2)	62.5 (29.5)	62.3 (22.6)
SF-36 SF	91.3 (18.7)	85 (25.8)	88.5 (17.3)	91.9 (25.7)
SF-36 RE	85.7 (31.3)	78.9 (33.7)	81 (31.3)	94.7 (22.9)
SF-36 MH	79.7 (13.9)	82.7 (14)	81.1 (21.4)	87.2 (11)
CRA-1	14.2 (4.4)	13.6 (5.2)	14.4 (3.4)	14.5 (5.3)
CRA-2	27.6 (4.1)	27.9 (5.9)	27.9 (4.6)	27.6 (6.4)
CRA-3	11.5 (2.7)	9.2 (3.6)	10.8 (3.9)	10 (3.3)
CRA-4	8.6 (2)	9.2 (3.9)	9.4 (2.5)	8.9 (3.3)
CRA-5	7 (1.8)	5.8 (2.1)	5.5 (1.7)	5.8 (1.9)
CES-D	6.3 (4.9)	8.6 (6.3)	8.1 (7.2)	6.4 (7.3)

Figure 17. Change in mental health among inpatients from discharge to follow-up.

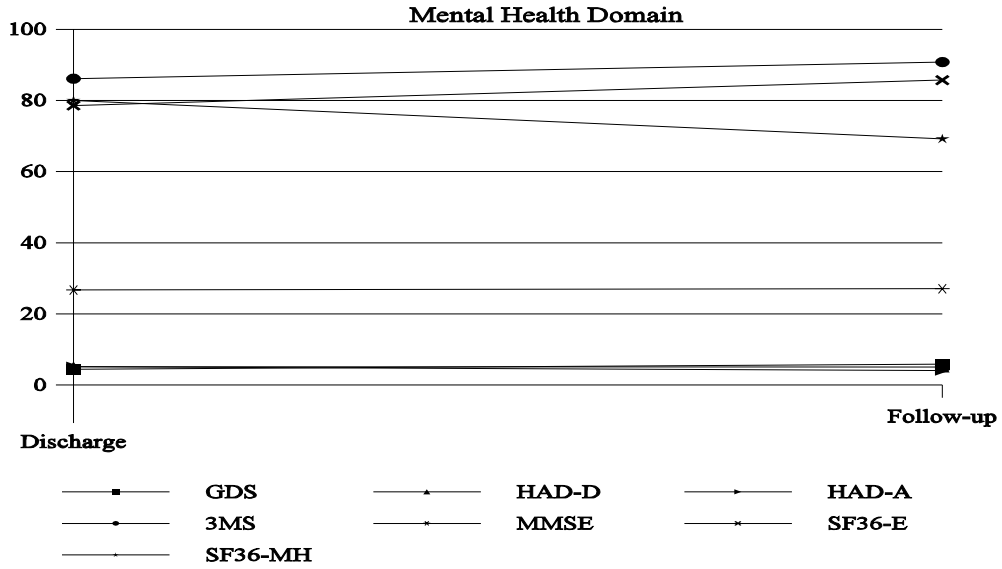


Figure 18. Change in mental health among outpatients from discharge to follow-up.

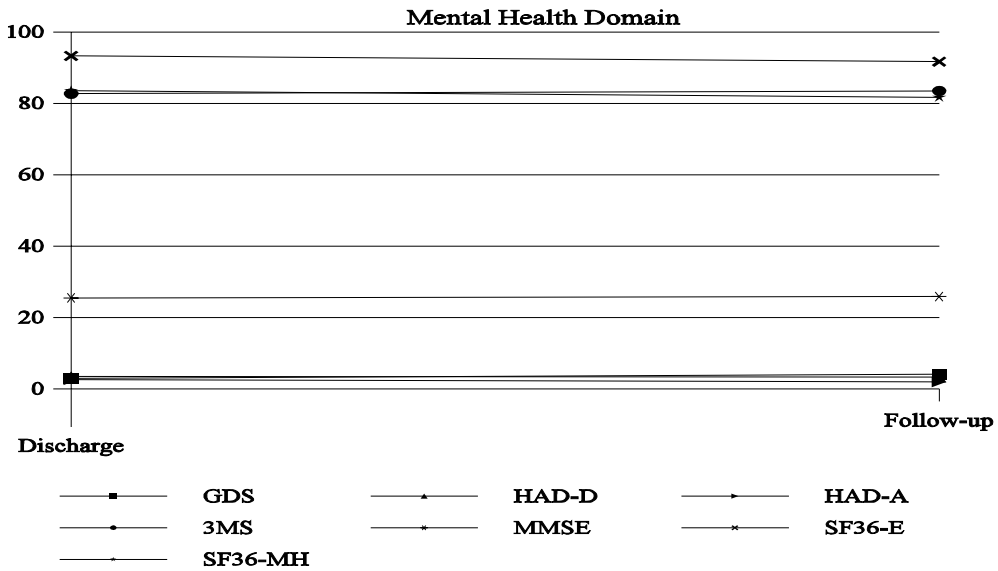


Table 20. Means and standard deviations (in brackets) for change in mental health among inpatients and outpatients from discharge to follow-up

	Discharge		Follow-up	
	Inpatients	Outpatients	Inpatients	Outpatients
GDS	4.4 (3)	3 (2.6)	5.9 (3.4)	4.1 (2.5)
HAD-D	5.2 (2.9)	3.5 (2.9)	5.1 (2.9)	3.3 (3)
HAD-A	5.2 (4.6)	2.6 (3)	4.1 (4)	2 (2.9)
3MS	86.1 (8.9)	82.7 (15.5)	90.8 (7.6)	83.5 (13.8)
MMSE	26.7 (2.8)	25.5 (4.3)	27.1 (2.8)	25.9 (3.8)
SF36-E	78.6 (42.6)	93.3 (23.2)	85.7 (36.3)	91.7 (26.2)
SF36-MH	80 (20.5)	83.6 (20)	69.2 (26.6)	81.7 (17)

Physical Health

When outpatients and inpatients were compared on measures of physical health, no significant differences were evident over time (see Figures 19-20, Table 21).

Daily Functioning

When outpatients and inpatients were compared on measures of daily functioning from discharge to four months post-discharge, no significant differences were evident over time (see Figures 21-22, Table 22).

Bodily Pain

When outpatients and inpatients were compared on measures of bodily pain, no significant differences were evident over time (see Figures 23-24, Table 23).

Figure 19. Change in physical health among inpatients from discharge to follow-up.

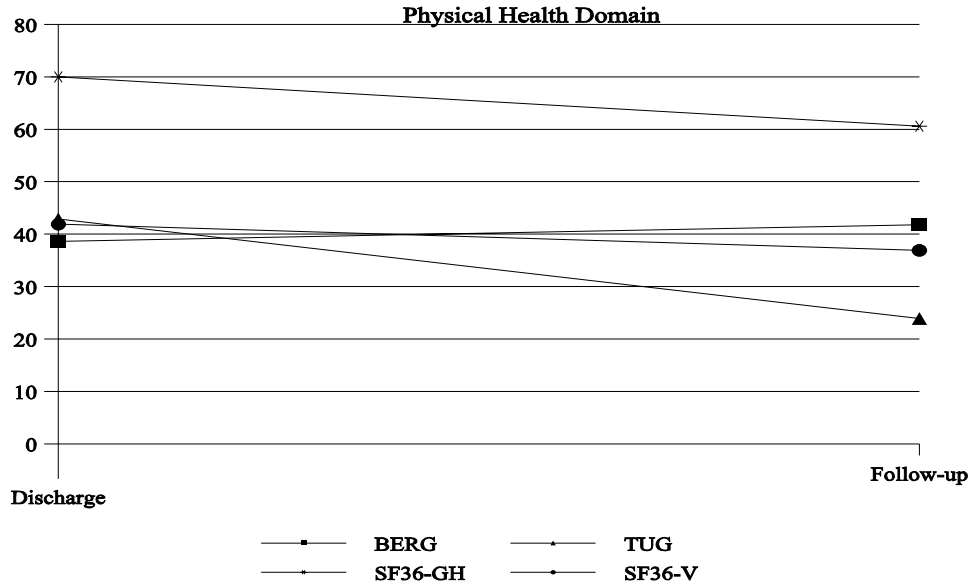


Figure 20. Change in physical health among outpatients from discharge to follow-up.

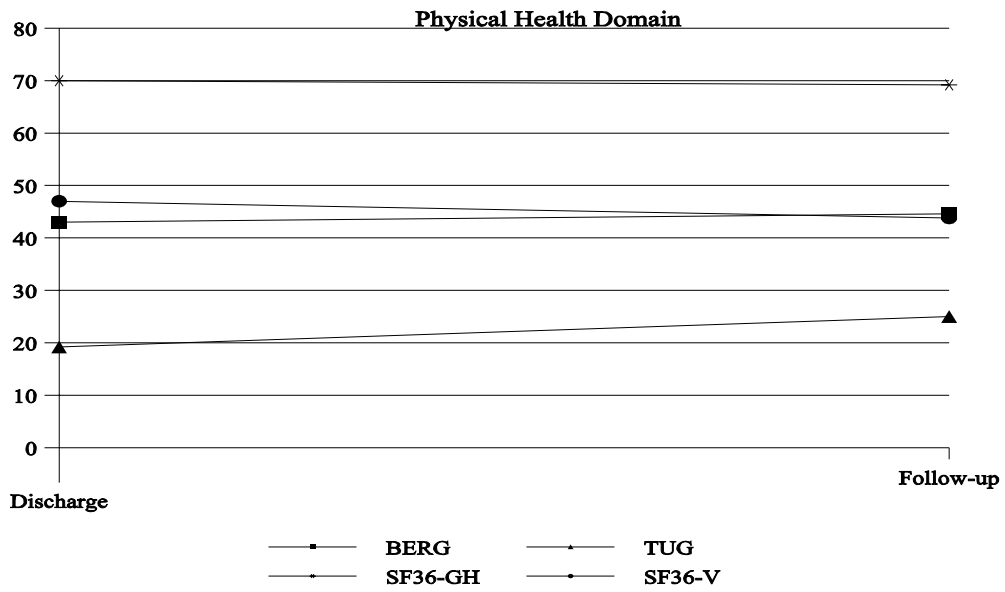


Table 21. Means and standard deviations (in brackets) for change in physical health among inpatients and outpatients from discharge to follow-up.

	Discharge		Follow-up	
	Inpatients	Outpatients	Inpatients	Outpatients
BERG	38.6 (10.7)	43 (9.2)	41.8 (10.2)	44.6 (10.3)
TUG	42.9 (62.7)	19.2 (8.4)	23.9 (14.1)	25 (24.9)
SF36-GH	70 (19.3)	70 (19.7)	60.6 (25.1)	69.2 (18)
SF36-V	41.9 (17.3)	47 (24.5)	36.9 (18.7)	43.8 (20.8)

Figure 21. Change in daily functioning among inpatients from discharge to follow-up.

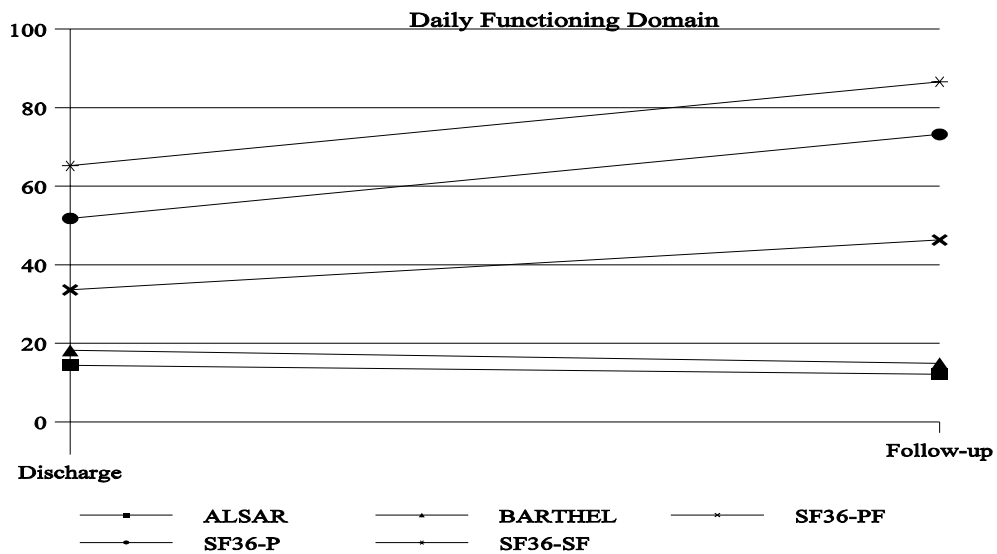


Figure 22. Change in daily functioning among outpatients from discharge to follow-up.

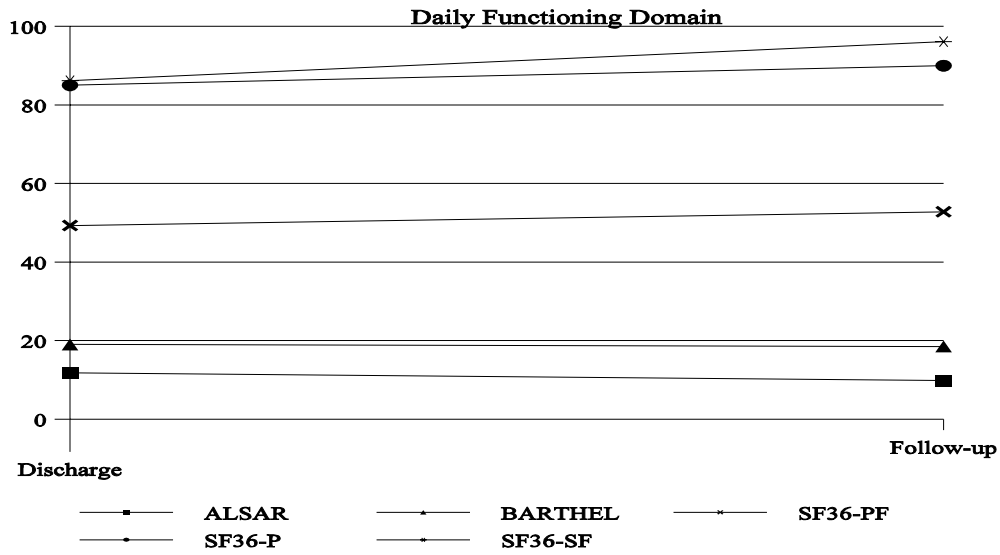


Table 22. Means and standard deviations (in brackets) for change in daily functioning among inpatients and outpatients from discharge to follow-up.

	Discharge		Follow-up	
	Inpatients	Outpatients	Inpatients	Outpatients
ALSAR	14.4 (4.3)	11.8 (6.1)	12.1 (4.5)	9.8 (4.9)
BARTHEL	18.2 (1.5)	19 (1.2)	14.9 (7.7)	18.5 (2.1)
SF36-PF	33.6 (19)	49.3 (27)	46.3 (27.5)	52.8 (32.1)
SF36-P	51.8 (43.3)	85 (30.8)	73.2 (39.8)	90 (30.8)
SF36-SF	65.2 (29.5)	86.2 (29.1)	86.6 (25.2)	96.1 (12.5)

Figure 23. Change in bodily pain among inpatients from discharge to follow-up.

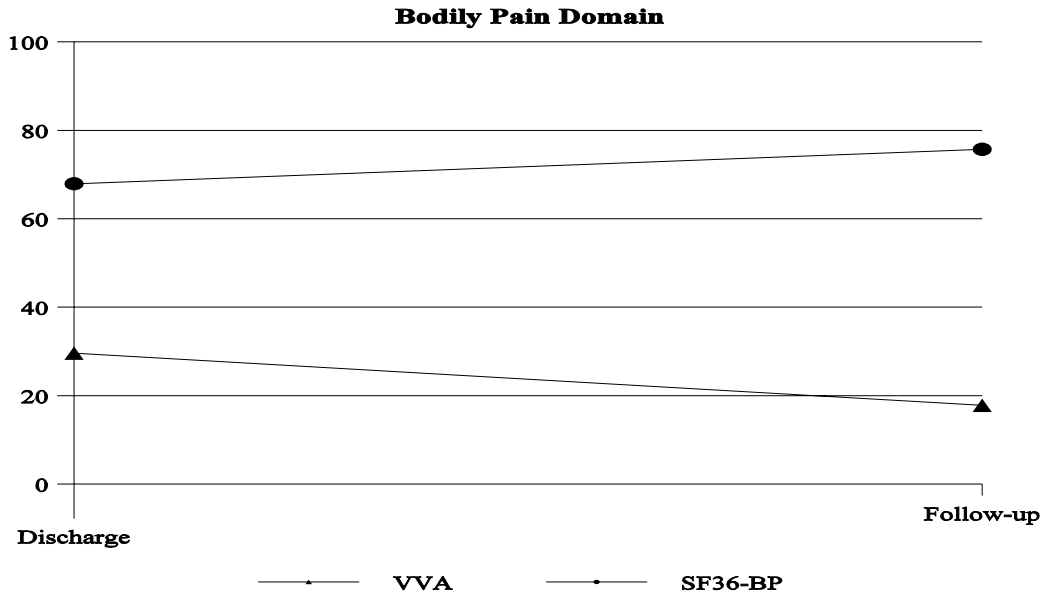


Figure 24. Change in bodily pain among outpatients from discharge to follow-up.

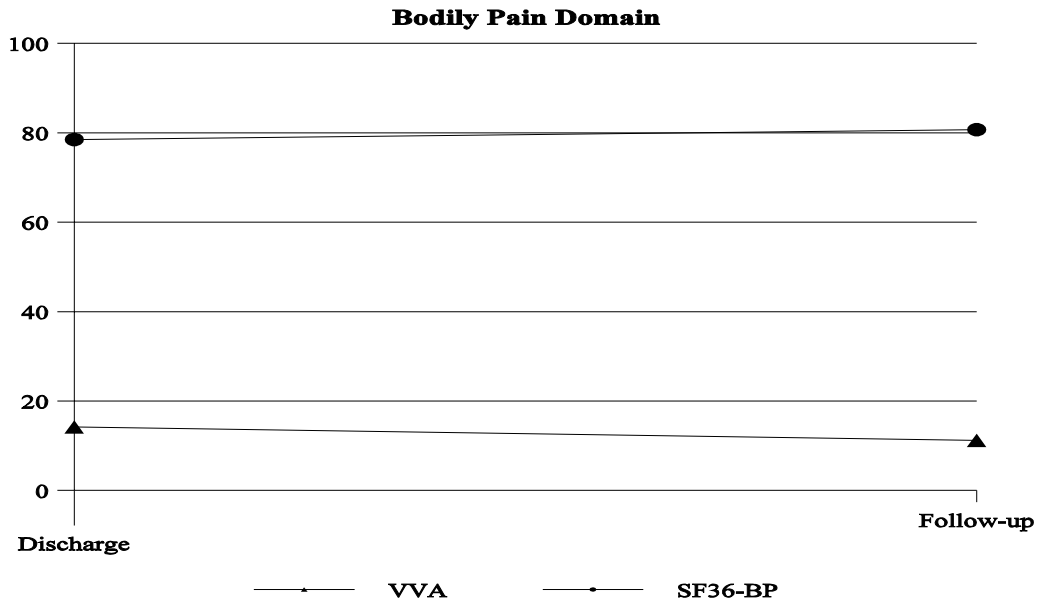


Table 23. Means and standard deviations (in brackets) for change in bodily pain among inpatients and outpatients from discharge to follow-up.

	Discharge		Follow-up	
	Inpatients	Outpatients	Inpatients	Outpatients
VVA	29.6 (30.3)	14.2 (24.1)	17.8 (22.2)	11.2 (26)
SF36-BP	67.9 (30.1)	78.5 (26.6)	75.7 (23.6)	80.7 (22.9)

Caregiver

When caregivers of inpatients and outpatients were compared on a battery of measures, no significant changes (i.e., decline or improvement) were observed from discharge to four months post-discharge (e.g., SF-36, CRA, and CES-D) (see Table 24).

Objective 4: evaluate the monetary cost-effectiveness of each program and the entire service

In order to evaluate the cost effectiveness of each service and the entire program it is necessary to have the services and program maintained for the duration of the study. While it is possible to adjust for a few changes, there were too many significant changes to the services to allow for the development of a valid cost-effective analysis. The issues and factors that prevented the development of a cost-effective analysis are contained in this section.

The program restructuring significantly changed the outpatient geriatric services (most notably GDH), and changed the patient admission practices and resources to the remaining three inpatient units. At the time of the restructuring, almost half of the total sample (i.e., 177 of 360 patients) had passed through the services and completed the first round of interviews. Only 25 had been discharged from inpatient services before the impact of the restructuring began to affect the patient admission practices and resources to the units. The decision to discontinue data collection at this time was made to ensure noncontamination of the patient groups by the effects of the restructuring process.

Table 24. Means and standard deviations (in brackets) for caregivers of inpatients and outpatients from discharge to follow-up

	Discharge		Follow-up	
	Inpatients	Outpatients	Inpatients	Outpatients
SF-36 PF	87.8 (11.2)	76.4 (26.7)	86.1 (9.6)	76.4 (24.8)
SF-36 RP	80.6 (34.9)	87.5 (32.2)	66.7 (50)	80.4 (39.4)
SF-36 BP	64.4 (24.5)	82.6 (28.2)	68.3 (32.2)	71.9 (34.6)
SF-36 GH	77.1 (24.1)	64 (23.9)	71.1 (24.8)	69.2 (20.4)
SF-36 V	67.2 (27.1)	62.9 (24.1)	58.9 (25.2)	56.1 (26.5)
SF-36 SF	85.9 (20.5)	88.4 (30.4)	98.4 (4.4)	89.3 (21.3)
SF-36 RE	77.8 (37.3)	92.9 (26.7)	100 (0)	85.7 (28.4)
SF-36 MH	89.8 (13.3)	85.4 (12.2)	91.1 (8.2)	80.3 (15.6)
CRA-1	14.3 (3.6)	14.6 (5.7)	13.5 (4.5)	13.2 (5.8)
CRA-2	29.1 (5.1)	29.8 (2.7)	30.5 (4)	31.7 (3.5)
CRA-3	9.8 (3.5)	9.1 (3.6)	10 (5.1)	7.3 (2.9)
CRA-4	8.1 (2.1)	8.3 (3.7)	7.4 (2.9)	8 (4.7)
CRA-5	6 (2.6)	6 (1.7)	5.9 (2.9)	5.4 (2.8)
CES-D	5.6 (6.2)	7.1 (8.6)	3.9 (2.8)	6.4 (6)

Achievement of cost-effective measurement was not possible due to the ongoing program changes that started while the study was ending its first phase and had started the second of three phases. The program and home care changes not only affected the services under study but also had significant known and unknown changes to comparative services in the community. The apples to apples comparability of services in the CHR no longer applied during the study period and the disruption continued for at least four months after the study period and may be ongoing.

As such, it was not possible to directly evaluate the extent to which home care is a cost-effective substitute for acute care, and under which condition it is, or is not, a cost-effective alternative.

CHAPTER 6: CONCLUSIONS

In summary, at admission, outpatients differed from inpatients on measures of physical health, daily functioning and bodily pain. Persons in the two outpatient services differed with respect to self-reported (i.e., SF-36) physical and general health, with GOC patients reporting less symptomatology. Persons in two inpatient rehabilitation units differed on measures of physical health and daily functioning, with persons on 7C being more physically frail but reporting better general health status. This would be expected as the latter group were post-acute care, whereas the former group came directly from the community. Persons in H2 showed more mental health problems and problems in daily functioning than persons attending outpatients programs. Thus, the persons attending the various services within the Department of Geriatric Services differ with respect to presenting symptomatology with those in the GOC reporting and demonstrating few problem areas and persons in the inpatient services reporting and demonstrating greater frailty (i.e., problems in physical health, mental health, daily functioning and pain).

One of our original premises was that if persons attending inpatient rehabilitation are distinctly different from those in GDH in terms of severity, chronicity of their conditions and need for medical intervention, support will exist for the position that these services represent a continuum of care and that one service is not substitutable for another. Within the samples examined, it appeared that this was true. Persons attending the GDH performed better than persons in 7C on a measure of balance, and on two measures of daily functioning (i.e., ALSAR, Barthel). Persons attending the GDH differed from persons in 7D on one measure of daily functioning (i.e., Barthel), with those on 7D performing more poorly. Persons attending the GDH showed better daily functioning than those in H2 and reported fewer mental health problems. It appears then that there is support for the notion that streamlining within the system (within the geriatric care program) exists and that each of these services addresses a specific subpopulation.

However, there is overlap within these patient groups on some dimensions, most notably cognitive functioning. That is, the patient groups did not differ from each other with respect to cognitive functioning as measured by the Mini-Mental State Examination (MMSE) or the modified version of this measure (3MS). It is possible that differences may have been evident on other measures of mental health (e.g., measures of behaviour, delirium, etc). Moreover, the GOC patients only differed from the GDH patients on two measures of self-reported health (i.e., physical health and general health). In addition, the persons on 7D were only performing more poorly than the persons attending the GDH on one measure of daily functioning (i.e., Barthel). Health status appeared to improve in various domains when receiving specialized geriatric care and examination of sustainability of improved health status over time supported the present model of care in that little deterioration in functioning was seen from discharge until 4 months post-discharge.

Despite the fact that one of the major objectives of this study was not achievable (i.e., cost-effectiveness analysis), there were many valuable lessons learned from the study that may inform future work in this area. These included how best to obtain cost information from families, time requirements for booking appointments with patients and their families, and the impact of research

involvement on non-research staff in research sites. A summary of those lessons is outlined in Appendix 4. Moreover, the available data may lend itself to examination of a variety of issues. Another recommendation based on our experience for researchers involved in evaluating programs is that it is important to ensure that the programs under study are not contaminated by changes in other programs in the continuum of care services. Thus, it may be necessary to monitor the impact of cuts or expansions in expenditures for complementary services that may affect the service under study (e.g., GDH, Outpatient or Community Services).

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VICTORIA GERIATRIC OUTCOME & EVALUATION STUDY

Patient ID Number:

9. Occupational Therapy

10. Social worker

11. Dietician

12. Mental Health (i.e.
Outreach Team)

13. Home supports in
place

14. Others
(specify_____)

Dementia Diagnosis: Physician (nurses to approach physician)

A. DSM 4 Diagnosis of Dementia **Yes/No** Type_____

B. DSM 4 Diagnosis of Depression **Yes /No**

C. Geriatric Giants: Falls, Immobility, chronic pain, Urinary incontinence, Fecal Incontinence

D. Clinicians Global Impression of Change (From Form)

CLINICAL GLOBAL IMPRESSIONS OF CHANGE (CGIC)

Were you involved in this patient's care shortly after admission to the program? _ YES _ NO

1. **Severity of Illness** Considering your total clinical experience with this particular population, how frail is the patient at this time?
**1 Not at all frail 2 Borderline frail 3 Mildly frail 4 Moderately frail
5 Markedly frail 6 Severely frail 7 Among the most extremely frail patients**
2. **Global Improvement.** Rate total improvement whether or not, in your judgement, it is due entirely to treatment. Compared to his condition on admission to the project, how much has he changed?
1 Very much improved 2 Much improved 3 Minimally improved 4 No change 5 Minimally worse 6 Much worse 7 Very much worse

Victoria GOES Inpatient Chart Checklist for costing

Scales redone as required

When completing the audit make sure to note any new diagnosis

1. Dates: admission, discharge (# of visits if GOC/DP). # Team visits if on chart.
2. List procedures from chart
3. **SIGNIFICANT CHANGE: ONLY** # of pharmacy drugs, # of over the counter, # of herbals
4. Other - including ambulance costs or emergency admission.
5. # visits, service provided from the patient charts
6. # visits, service provided from the patient charts
7. By procedure from the patients chart
8. Time spent between doctors on the phone and in meeting with the patient.
9. # visits, then determine services needed, length of service IF ON CHART
10. # visits, then determine services needed, length of service IF ON CHART
11. # visits, then determine services needed, length of service IF ON CHART
12. # visits, then determine services needed, length of service IF ON CHART
13. # visits, then determine services needed, length of service IF ON CHART
14. List home support information from chart, IF ON CHART
15. # visits, then determine services needed, length of service IF ON CHART

CLINICAL GLOBAL IMPRESSIONS OF CHANGE (CGIC)

Instructions:

1. This scale is to be completed by the physician at discharge.
2. Complete the scale after interviewing the caregiver (first) and patient (second).
3. Please do not refer to other functional scales when arriving at your conclusion.

DSM IV (for Physician Reference in completing the patient chart review, bottom of page 2)

DEMENTIA - Dementia of the Alzheimer's Type

- A. The development of multiple cognitive deficits manifested by both
- 1) memory impairment (impaired ability to learn new information or to recall previously learned information)
 - 2) one (or more) of the following cognitive disturbances:
 - a) aphasia (language disturbance)
 - b) apraxia (impaired ability to carry out motor activities despite intact motor function)
 - c) agnosia failure to recognise or identify objects despite intact sensory function)
 - d) disturbance in executive functioning (i.e.) planning, organizing, sequencing, abstracting)
- A. The cognitive deficits in Criteria A1 and A2 each cause significant impairment in social or occupational functioning and represent a significant decline from a previous level of functioning.

DEPRESSION - Major Depressive Episode

- A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; At least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure. Note: Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.
- 1) depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). Note: in children and adolescents, can be irritable mood.
 - 2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others)
 - 3) significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. Note: in children, consider failure to make expected weight gains.
 - 4) insomnia or hypersomnia nearly every day
 - 5) psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)
 - 6) fatigue or loss of energy nearly every day

- 7) feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)
 - 8) diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)
 - 9) recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide
- B. The symptoms do not meet criteria for a Mixed Episode.
- C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).
- E. The symptoms are not better accounted for by Bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than two months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

Appendix 2

VICTORIA GERIATRIC OUTCOME & EVALUATION STUDY

How to Measure the Costs

Community Based Administrative Sources

Health Services Used by a Person in care

Pursue MSP and CHR database information to see how complete the records are and if a chart review is required.

Alternatively, if the 90 people who fill out the detailed time/services log do an accurate and complete job we could cost the expenses from those logs.

Services	Unit Of Measure	Where and How to Measure
Case Management	# visits, phone calls, time spent	From CHR staff or client records Could divide case over total caseload times salary and overhead cost or if readily available get the exact value
Quick response team	amount of time	From CHR staff or client records
Home Nursing	# visits, amount of time	From CHR staff or client records
Physiotherapy	# visits/activity	From CHR staff or client records
Home support worker	# visits, amount of time	From CHR staff or client records
Occupational Therapy	# visits, amount of time	From CHR staff or client records
Personal/live in (hours)	# visits, amount of time	From CHR staff or client records
Doctors visits	# visits or consultations	From MSP records
Lab Tests	# visits/activity	From MSP records
Alternative Health	# visits/activity	From CHR staff or client records
Adult Day Centre _____	# visits/location	From CHR staff or client records
Dietician	# visits or consultations	From CHR staff or client records
Mental Health team	# visits, provider of service	From CHR staff or client records
Mental Health outreach services	# visits, provider of service	From CHR staff or client records
Others (specify _____)		

To obtain the above information will require access to patient MSP records, CHR administrative databases, and client files. If a review of client files is required, it might be done at the end of the study to ensure all data is in the records and the review of the file is done only once. As a number of persons in care go through the study, a batch of records could be reviewed for those who have completed the study to that point. Study staff could do this file review during the low part of the cycle of the study (which never happened as most staff were terminated when the GOC department restructure ended the ability to interview the 360 participants as planned).

Appendix 3

VICTORIA GERIATRIC OUTCOMES EVALUATION STUDY

TIME AND EXPENSE Interview for a period of the past 4 weeks Patient ID Number:

Date: Did not want to participate _ Assessor ID Number:

Household and Transport (minutes)	Number of times in four weeks?	For an average of how many minutes each time?
1. Housekeeping	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
2. Meal Preparation	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
3. Food Purchasing	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
4. Other Purchasing (clothes, etc.)	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
5. Banking, investments, bill paying	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
6. Accompanying to Appointments	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
7. Transportation	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
8. Other (specify) _____	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __

Health Treatment (minutes)	Number of times in four weeks?	For an average of how many minutes each time?
9. Giving medicine	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
10. Changing Bandages	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
11. Helping with medical equipment	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
12. Preparing Treatment	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
13. Physio/occupational therapy helping	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
14. Other (specify) _____	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __

Personal Care (minutes)	Number of times in four weeks?	For an average of how many minutes each time?
15. Overnight assistance (11 pm to 7 am)	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
16. Feeding	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
17. Bathing	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
18. Bathroom/bed pan assistance	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
19. Hygiene	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
20. Dressing	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
21. Social needs/supportive help	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __
22. Other (specify) _____	0 1 2 3 4 5 6 7 8 __	15 30 45 60 __

23. Time Lost From Paid Work (hours) in the past 4 weeks **How much time away from paid work have you spent helping this person? Don't know or _____**

Expenditures in Dollars	Can you estimate how much has been spent for the person in care's
24. Food	Don't know 0 1 to \$50 51 to 100 100 to 200 _____
25. Medical Supplies	Don't know 0 1 to \$50 51 to 100 100 to 200 _____
26. Pharmacy, herbs, over the counter	Don't know 0 1 to \$50 51 to 100 100 to 200 _____
27. Transportation (taxi, handi-dart)	Don't know 0 1 to \$50 51 to 100 100 to 200 _____
28. Other Health Related _____	Don't know 0 1 to \$50 51 to 100 100 to 200 _____

WEEKLY TIME AND EXPENSE LOG

Minutes Spent by Caregiver on patient: Caregiver time only, not patient time, not purchased help.

I. Household and Transport (minutes)

1. Housekeeping - by the caregiver (not purchased time) in maintaining the patient's home.
2. Meal Preparation - The patient's meals (estimate a portion of time if for more than one person), DOES NOT INCLUDE MEALS PURCHASED (i.e. food from a restaurant, meals on wheels).
3. Food Purchasing - For patient only, includes driving to and from the store.
4. Other Purchasing (clothes, etc.) - For patient only, clothes, medical supplies, and health needs.
5. Banking, investments and bill paying - For patient to maintain their home and pay their health bills.
6. Accompanying to appointments - Time spent waiting at doctors and other offices
7. Transportation - For household needs and (shopping) health treatments, hygiene (haircuts), other health related programs like day care, and program services.
8. Other - Laundering or performs or buys home or lawn maintenance, or other activities.

Health Treatment (minutes)

1. Giving medicine - All medication, and includes herbal remedies and over the counter drugs.
2. Changing Bandages - All forms of bandages, slings and dressings.
3. Helping with medical equipment - Oxygen tanks, food pumps, monitors, testing strips, etc.
4. Preparing Treatment - Some medicines and remedies take some effort to make.
5. Helping with physio/occupational therapy - Exercises provided by a doctor or therapist.

Personal Care (minutes)

1. Overnight assistance - for those tasks that happen between 11 p.m. and 7 a.m. and that do not fit into categories included elsewhere on the log (helping the person in care get back to sleep).
2. Feeding - Time spent helping the person eat, and does not include meal preparation time.
3. Bathing - Help with sponge baths, showers and baths.
4. Bathroom/bed pans, incontinence pads, assisting to and from the bathrooms, etc.
5. Hygiene - Helping with dental, hair, shaving, morning and evening care, hands and feet care.
6. Dressing - Putting on or taking off clothes or shoes, changing clothes, help with shoes
7. Social needs/supportive help - Visiting and recreational activities. **NOT** part of a health therapy or treatment, during transit or household activity, or during feeding or personal care time.

1. **Time Lost From Paid Work** - Please record how much the time away from paid work is.

Expenditures in Dollars - all dollars spent for the person being cared for

2. Food - meals bought that are partially or completely prepared i.e. meals on wheels, home-delivery.
3. Medical Supplies - include payments for bandages and tape, needles, crutches, walkers, canes, etc.
4. Pharmacy - drugs by prescription, herbal, and over the counter drug purchases.
5. Transportation - money spent to get to health treatments, personal care, food, clothes and banking.
6. Other Health Related - please specify any expenses not included above.

Appendix 4

Valuable Lessons Learned

Problems with measuring the cost of care to families:

- Tried different forms and formats to gather all the information needed but reduce the recording burden from caregivers as much as possible
- "Perfecting" the forms in time for the premature restructure of the study
- Only 3 of 50 people that made it to the second round had been assessed for personal financial and family time commitments, although dozens of others were assessed in the first round (we should probably analyze this info as a separate venture to the main study)
- Low numbers because of the early termination of the program, the forms were perfected less than two weeks before the final restructure of the study (three months before the planned end. Instead of getting 313 of 360 patients there were only 3 of 50).
- High rejection rate by staff, patients and caregivers.

Caregiver

Profile - Often the spouse of the person in care (in 70 - 80's) or an immediate family member.

1. Logs: People are very sensitive about the time and expense logs, no matter what version of log was offered there was outright rejection of the log. There were three reasons for rejection:
 - The elderly spouse have enough burden without the added workload of keeping track of costs and time they spend with someone.
 - The child or friend does not want to take on the added responsibility and feel they are not the primary people providing care (yet by definition they are).
 - Often the sudden decline of the health of the person in care that has prompted admission to the various services is of such immediate and overwhelming concern that more workload is not welcome. The focus of the family is to find out what is wrong with the person, worry about their own situation and the future disposition of the person coming into care.
 - We have developed a replacement to the logs that will be in the form of an interview questionnaire taken at the time of the caregiver interview. The balance of the information will be gathered from administrative data sources at the region and the hospital.
 - Problem in separating what is care time and social time. For example, does a 45-minute doctor office visit count as health related time or a social benefit?

1. Consent Forms: We established new ground at the respective institutions by accepting faxed caregiver signatures as original.

2. Caregiver burden assessment: We are testing two instruments. One tests the traditional definition of burden of care the second presupposed that there is also some value in providing care and not just a burden.

Scheduling and patient access

- Booking is unpredictable at the facilities and is often done on mass and made available at the last minute. Monitor the waiting list closely and probably work from that instead.
- Arranging appointments with patients and caregivers can take several hours of work per patient, and is probably averaging about one hour per patient to be assessed. That time is not factored into the study but is a real cost.
- Patients are often taken away for tests and the assessment process is interrupted. It can take several extra hours to complete assessments. In the downtime our assessor staff telephoned other prospective patients, do photocopying; review chart information and status of patients in the project.
- Some of the assessments can take up to three hours for some patients. Some patients are unable to complete the tests in one sitting. The interviews may need to be conducted over a two-day period.
- Discharge assessment to be done within 48 hours of discharge.

Refusals

- Do not issue a number because it throws off the use of any random number process you may use (the N becomes unknown). File a piece of paper with the data analysis people that contains a postal code, age, sex.

Research Staff

- Part time staff has a value and a cost to the study. Train more people than you estimate you need so that you do not have to repeat training for new staff as they come on during the study. Attrition due to other work commitments or injury can reduce staff. The additional staff can be used in the high demand start-up period and reduced as required or as others pick up facility relief hours. The alternative is train more staff as you need them but we found they required the core training the others received plus the meeting discussions they missed, which ties up a senior assessor for an additional few days for each new group of staff.
- At least some of the staff should have worked as a caregiver or in one of the helping professions in order to assimilate readily into the work environment and understand the complex persons in care.

Relations with Care Professionals

- Press releases and interviews were conducted with local media and posters were placed in each facility to raise public and professional awareness and acceptance of the project. Letterhead of each institution that is involved in the project, and used the project name on forms to raise participant and staff awareness of Victoria GOES.
- Adapt to local rules about placing materials on charts or in separate binders, what ever was the local policy. When test results were not put on the patient's chart, it was noted on the chart that the test results were in another location (i.e. a separate binder).
- By using people familiar with the protocols of the facility and relative roles of each of the professions, it was possible to avoid most conflicts and gain wide acceptance by staff.
- When conflict occurred it related to an interpretation of how to conduct a test or assessment. Our staff would review the literature and would note for staff from the author's of the various tools how a test was to be conducted. This led to a need for a copy of the literature to be on site with our assessors for both their and other professionals' referral to resolve any concerns. This copy of the literature was also useful for the continuing education of our assessors.
- Facility staff study fatigue proved a problem at one facility. There was an abnormally high number of rejections at one facility and found that staff had been subjected to a number of other research studies in the past year. Facility staff advised persons in care not to participate, as it was not required as a therapy for the patient. The facility staff was looking out for the patients' well being as the patients may have been fatigued by their illness, testing done by the facility and the stress of the life change. Watch for early abnormal numbers of rejections and find out the reason why.

Study Protocols

- Even if protocol agreements are in place, it is possible to have services cut mid-study without notice or consultation. Most budgets are known by mid-may and budget decisions taken by June 30, with implementation in the fall.
- Visit facility staff meetings to describe the study and who to contact if there are concerns or problems during the study.

Forms

- For data entry, ensure that caregiver and person in care assessment forms are clearly marked with coding at the top of the page.

- Ensure a space for ID number is at the top of each page for each form in case the pages become separated.
- Include a study telephone number (even voice mail) at the bottom of any forms that the person in care or caregiver receives. This includes consent forms and all logs. This provides people with a level of assurance that the study is legitimate and a place to verify that the assessors are with the university or the health agency involved in the project.
- Include a date at the bottom of the page to signify when the form was created or updated.
- Write out the first three letters of the month date as people use different versions of day/month/year, month/day/year to signify the date.
- Assessors are encouraged to write notes on forms to assist with scoring (done at data analysis), especially 3MS.
- It is easier to record information on single sided forms than double sided, especially when the completed forms have to be photocopied.
- Additional instruments became known after the study was approved. Several of these instruments hold a great deal of promise for future assessment of caregiver burden and a patient's ability to function. This leads to some partial duplication of some instruments and creates some additional costs for printing.
- Do not ever leave a space blank.
- Hole punch all forms
- Each form has a space for the assessor ID and each assessor is assigned a unique number ID.

Cost Savings Measures

- The original proposal assumed that multi part forms would be used so that records could be kept on the patient's chart and forwarded for data entry and analysis. It was found that the forms were constantly evolving through the study and that the use of multi-part forms was impractical. Further, the cost of multi part forms was prohibitive, although it led to some staff cost to photocopy the assessment results.
- By eliminating return of logs by mail, we eliminated over \$500 in postage costs that were unbudgeted.

- By not telephoning caregivers that are long distance there are additional savings. The rationale is that they are too removed from the patient to be of any value.
- By replacing the logs with interviews we removed the time to train, our assessors and caregivers to complete the forms and the 3 follow up calls to ensure the forms are completed and sent in. This represents significant cost savings (although not identified as a cost in the original budget).
- Resist requests for other valuable information to be gathered.

Problem question areas

- On demographic forms, the information for annual income requires a not available box as well as approximations of what CPP and OAS pension plan converts into dollars.
- On demographic forms, people associate with pensions rather than amounts. Several people have misrepresented their income levels (i.e. owns two homes in two countries and travels between them each year on less than \$5,000 a year).
- Time is valuable; so do not spend a lot of it tracking down one piece of information. HOWEVER, indicate if it is just too much time to get, or not readily available, or outline why you cannot get the information.
- One of the major changes often observed is either change in medication and/or the participant receiving new medication; make sure this information is captured.
- Study co-ordinator to maintain master list of names and ID numbers

Berg

- If a Berg has already been done by facility staff (within two weeks) then copy it for study purposes instead of redoing it.
- Berg must be done without an aid.

TUG

- Some of the physiotherapists have a different interpretation of whether a walking aid can be used to conduct the TUG. The use of an aid is acceptable in doing the TUG according to the original research.

- Just a reminder to the nurses to do 1 dry run of the TUG before scoring it. I think that will give a more valid response and end the problem with people doing better on the Manual TUG.

ALSAR

- Should be done with the best available information. Use one week before admission as an anchor.

Staff Related Issues

- Plan monthly meetings, but in the first, few weeks expect weekly meetings.
- Each week obtain a report on the number of assessments completed by site, number of discharges completed per site, number of follow ups completed by site, number of refusals per site, and total number seen. Immediate follow up is required when refusals rise or assessment numbers start to miss weekly targets.
- Expect both fatigue and travel time to limit community based visits to at least one fewer than you expect. For example if you expect four one and one half-hour interviews then you will probably get three, and if one of those is complex then expect two per day.
- After a training period and time to work out the bugs in the process, start to remunerate staff on a per assessment basis to ensure budget control.