Selection of Geriatric Rehabilitation Clients by Geriatric Clinicians in Emergency Departments

by

Eleanor Marlene Graceffo

A Thesis submitted to the Faculty of Graduate Studies of
The University of Manitoba
in partial fulfillment of the requirements of the degree of

MASTER OF SCIENCE

School of Medical Rehabilitation

University of Manitoba

Winnipeg

Abstract

The purpose of this study was to compare the discharge outcomes of two client groups who were admitted to geriatric rehabilitation units (GRU). The Emergency Department or ED Group were clients seen by WRHA Geriatric Program Assessment Team (GPAT) geriatric clinicians in EDs and admitted directly to geriatric rehabilitation units and the Acute Group were clients admitted from inpatient acute care units to geriatric rehabilitation units. The study design was a retrospective study using administrative data to examine two groups for the following discharge outcomes: discharged home, discharged to personal care home, and poor outcomes of either medical instability or mortality.

The study results found that 70% of clients assessed by GPAT clinicians and admitted from the ED directly to a GRU were discharged home. Similarly, 68% of the clients admitted from acute inpatient units to a GRU were discharged home. The discharge home outcomes indicate that geriatric clinicians in consultation with team Geriatricians were able to select geriatric rehabilitation clients in a busy ED despite the need for an abbreviated evaluation period requiring rapid decision-making. Results of the study indicate that clinicians in this unique GPAT program utilizing collaboration between the ED team and clear GRU admission criteria selected ED clients with potential to benefit from the rehabilitation process and return to their homes in the community. Furthermore, 6% of the ED Group cases had poor outcomes of medical instability or mortality and 10 % of the Acute Group had poor outcomes following GRU admission (see Table 2).

Acknowledgements

I would like to dedicate this thesis to my family, especially my husband, Greg. Without his ongoing love, support, encouragement, understanding and care, this accomplishment would have been much more difficult. My sons, Mark and Luke, and my daughter Laura and her husband Real have been interested and supportive through these past few years, and I love them for this. My loving thanks to all of you.

I would also like to extend my thanks to my parents for raising me to always strive to achieve my best. I offer thanks to all of my family and my many friends who have offered encouragement always.

I wish to acknowledge my advisor Dr. Leah Weinberg (Ph.D.) for her knowledge and guidance through the attainment of my Master in Science (Rehabilitation). She has offered valuable advice and support over the past three years. I extend a grateful thank-you to Dr. Patrick Montgomery MD, FRCPC and Ms. Jenneth Swinamer BPT, MSA (Health) who agreed to assist as my committee members. I appreciate their valuable suggestions and assistance.

I would like to thank all of my course instructors for their encouragement and suggestions along the path toward my Masters. In particular, thank- you to Dr. Thomas Hassard who spent time assisting me through Biostatistics.

I am eternally grateful for the assistance of Audrey Blandford, from the Centre on Aging. Her expertise and knowledge of statistical analyses was amazing.

Finally, I would like to acknowledge the support of the WRHA Rehabilitation and Geriatrics program Director, Ms. Jo-Ann McKenzie RN, BScN, MN. The support offered to me for completing this thesis has been gratefully appreciated. I also acknowledge all of the administrative support staff of the WRHA Rehabilitation and Geriatrics program who assisted and supported me when it was needed.

Table of Contents   <u>Page</u>

List of Figures

List of Tables

List of Appendices

SELECTION OF GERIATRIC REHABILITATION CLIENTS BY GERIATRIC CLINICIANS IN EMERGENCY DEPARTMENTS

Chapter 1: Introduction

In the past twenty years, most regions of Canada have developed specialized geriatric services to assist physicians with the care of complex, frail, elderly clients and some regions, such as the Winnipeg Regional Health Authority (WRHA), have added specialized geriatric services to the hospital Emergency Departments (ED). Specifically, Geriatric Program Assessment Team (GPAT) geriatric clinicians have become a vital part of emergency department teams in Winnipeg hospitals. The need for emergency room geriatric assessments led to the establishment of the unique role of the GPAT as part of the services provided to older adults in the WRHA in Winnipeg, Manitoba, Canada (www.wrha.mb.ca). Specially trained geriatric clinicians within the GPAT program have provided geriatric assessments and interventions in EDs as well as in the homes of community-dwelling elderly clients, thereby following patients across the continuum of care.

The ultimate goal of geriatric medicine has always been to maintain elderly clients in the community. Therefore, it remains important to provide geriatric rehabilitation services for those patients presenting to EDs who can benefit from these services, namely, those who have the potential to return home. When compared to younger adults, older adults have increased rates of emergency service use with greater levels of urgency (McCusker & Verdon, 2006). However, selection of clients for geriatric rehabilitation inpatient units by GPAT clinicians in

a busy ED has been a difficult task. In the community, GPAT clinicians may take up to two or three hours to adequately complete a comprehensive geriatric assessment of a complex client. The time for a thorough assessment is not possible in an ED because the environment requires quick decision-making regarding the disposition of clients from the ED. This view is supported by Hwang and Morrison (2007) who stated that providing accurate evaluation of geriatric clients in a busy ED may be difficult and challenging because the environment has constant noise, activity, and fall hazards. In addition, the older population who present to EDs are at higher risk of adverse outcomes such as medical complication, functional decline, and poorer health quality following hospitalization (Hwang & Morrison, 2007; McCusker & Verdon, 2006). Nonetheless, with collaboration of an Emergency Department (ED) team consisting of a physiotherapist, occupational therapist, nurse, social worker, hospital home care coordinator, and geriatric clinician, it may be possible to determine a client's strengths and needs, and whether admission to a geriatric rehabilitation inpatient unit was required.

In Winnipeg, older adults are admitted either through Emergency Departments or acute care units to geriatric rehabilitation unit (GRU). In the ED, the geriatric clinician may discuss the client's potential for rehabilitation with the Geriatrician after review of the client assessments and necessary collateral information collected in the ED. When compared to the detailed comprehensive geriatric assessment that clinicians are able to complete in the community, the ED allows only a brief screening and assessment period that may influence (negatively or positively) referral to geriatric rehabilitation units. In relation to the

rapid decision-making environment, it is possible that clients admitted directly from EDs to GRUs may have undiscovered health problems that may contribute to the medical instability or mortality for these clients.

It is important to examine the discharge and health outcomes of these two groups of clients because the time for screening and assessment is different for the two groups, before admission to a GRU. However, the discharge outcomes of ED clients compared to acute care clients admitted to geriatric rehabilitation units has not been examined. The present research question addresses this void in the literature. Specifically, are geriatric clinicians able to effectively select geriatric rehabilitation clients in a busy ED setting in terms of discharge outcomes? In order to answer this question, specific outcomes were evaluated for older adults assessed by geriatric clinicians in EDs, and admitted directly to geriatric rehabilitation units. These outcomes were compared to outcomes of older adults admitted from other acute care units to geriatric rehabilitation units. The specific discharge outcomes of interest in this study were: discharge home, discharge to Personal Care Home (PCH), and poor outcomes of medical instability or mortality.

Chapter 2: Literature Review

Comprehensive Geriatric Assessments

Comprehensive Geriatric Assessment (CGA) has been defined by the National Institutes of Health Consensus panel in 1987 as "a multidisciplinary evaluation in which the multiple problems of the older person are uncovered, described, and explained, if possible, and in which the resources and strengths of the person are catalogued, need for services assessed, and a coordinated care plan developed to focus interventions on the person's problems" (Solomon, et al., 2003, p. 1490). Thus, standard comprehensive geriatric assessments are integral to effectively caring for the elderly client. The literature indicated that this type of assessment may include medication review, physical examination, oral health assessment, vision and hearing tests, gait and balance assessment, functional assessment, review of psychosocial factors, (eg. informal/family and formal/professional supports), and environmental risk factors for falls (Alessi, Stuck, Aronow, Yuhas, et al., 1997; Caplan, Coconis, Board, Sayers, & Woods, 2006; Dalziel, W., Susinski, and Dalziel, L., 1992; Zarit, Reever, and Bach-Peterson, 1980). Standard objective measurement instruments are embedded within comprehensive geriatric assessments (CGAs); these provide objective baseline information at the time of initial and subsequent assessments. The instruments help track cognitive, functional, and caregiver changes that may occur over time as the client and informal caregiver age.

In addition, structured assessment instruments are an ideal way of identifying new issues not previously detected in order to determine individual goals and care needs. Some of the consistent standardized assessment instruments that may be included in CGAs and common to most programs are: the Standardized Mini-Mental State Exam (SMMSE) (Molloy and Clarnette,1999); or Mini-Mental State exam (MMSE) (Folstien, et al.,1975); the Geriatric Depression Scale (GDS) (Yesavage, et, al.,1983); or neuro-vegetative signs of depression; Activities of Daily Living (ADL) (Shah, Maly, Frank, Hirsch, & Reuben, et al., 1997); Instrumental Activities of Daily Living (IADL) (Alessi, et al., 1997); and the Timed Up and Go (TUG) mobility assessment (Podsiadlo & Richardson, 1991). Other programs add postural blood pressure measurement, the Individual Dysfunctional Behaviour Rating Scale (Principi, Lever, Vertesi, Molloy, & Tuttle, 1996), and a Functional Independence Measure (Hamilton, Granger, Sherwin, & Keith, 1987; Principi, et al.). Variations exist throughout different regions or countries, but these basic measurement instruments are utilized in geriatric assessments in most sites where CGAs are available.

The prime CGA sites are consistently reported in the literature include: (a) hospital geriatric evaluation and management units, (b) inpatient geriatric consultation services, (c) home assessment services for community-dwelling elderly, (d) hospital to home assessments for recently discharged patients, and (e) outpatient assessment services (Alessi, et al., 1997; Caplan, Coconis, Board, Sayers, & Woods, 2006; Dalby, Sellors, Fraser, D., Fraser, C., van Ineveld, et al., 2000; Montgomery & Fallis, 2003; Stuck, Siu, Wieland, Adams, & Rubenstein 1993). The inpatient geriatric consultation services are available in two tertiary

hospital sites and four community hospital sites within the WRHA. In addition,

what the literature refers to as the hospital geriatric evaluation and management

units are referred to as geriatric rehabilitation units (GRUs) in the WRHA. These

units are located in four different hospital sites, two of which have no acute care

or emergency departments (EDs).

The Geriatric Program Assessment Teams (GPATs) in the WRHA provide

consultation services to six EDs in Winnipeg. Furthermore, the same GPAT

program provides the home assessment service and the hospital to home

assessment service for community-dwelling elderly clients recently discharged

from inpatient units and EDs. A variety of other programs in the WRHA also

support the hospital to home assessment service for older adults, and two of

these include the Home Care program and the Geriatric Mental Health Teams. In

addition, outpatient assessment services are available in four geriatric day

hospitals. Day Hospitals offer a range of assessments and interventions for

individuals with problems that require input from a minimum of two disciplines in

the multidisciplinary team as well as Geriatrician assessments (Montgomery &

Fallis, 2003).

The WRHA Geriatric Program Assessment Teams

Development

The Geriatric Program Assessment Team (GPAT) program provides

outreach services within the Rehabilitation and Geriatrics portfolio of the WRHA.

In 1999, five separate GPAT teams were established, consisting of a Geriatrician

and three team members to provide service to five separate catchment areas within the WRHA. A variety of health disciplines were recruited and trained as GPAT geriatric clinicians to complete comprehensive geriatric assessments. Their training was supervised by all WRHA Geriatricians and lasted approximately eight to twelve weeks. At that time, each team within the GPAT program consisted of a Geriatrician and three geriatric clinicians drawn from four professional disciplines of physiotherapist, nurse, occupational therapist, and social worker. The assessments of older adults are performed independently by a single geriatric clinician. Following the assessments, weekly meetings are scheduled with the team Geriatrician to review all of the clients who were seen during the week by the team clinicians.

Team reviews provide an opportunity for client problem-solving, consideration of client-focused service options, and discussion of recommendations to be sent to the client's physician advising of the client issues and care options. Over the course of the first five years the program took on a broader perspective involving the EDs of the community and tertiary hospitals in Winnipeg. All teams received referrals requesting comprehensive geriatric community follow-up after clients were discharged from the EDs, but only a few team members physically attended the EDs to assist with the management of complex geriatric clients.

In 2004, a Winnipeg Regional Health Authority Emergency Room task force documented a number of recommendations to improve the quality of care for older adults in all EDs. Two recommendations directly impacted the GPAT program involvement in EDs. These recommendations were: 1. geriatric

clinicians would have a standard approach to assessment in the emergency

room, and 2. geriatric clinicians would prioritize the ED in their caseload in order

to provide improved care for complex geriatric clients presenting to emergency

departments. As a result of the task force recommendations, the five original

teams were increased to six teams in order to service all EDs. No additional

resources were available for this restructuring. As such, geriatric clinicians were

distributed into two teams consisting of three geriatric clinicians and a

Geriatrician, and four teams consisting of two geriatric clinicians and a

Geriatrician. The original five community areas were restructured into six

community areas. This will be discussed in more detail in the emergency

department section to follow.

Team Model

The WRHA Geriatric Program Assessment Teams were developed based

on the model used by the Geriatric Outreach Assessment Teams in Ottawa,

Ontario that was implemented in 1988 (Dalziel, et al., 1992). In the Ottawa model

there were only two outreach teams in the city but the teams were larger and

included a physiotherapist, nurse, occupational therapist, social worker, and a

geriatrician on each team. The team members were called assessors and they

completed a standard multidimensional assessment independently in the client's

home. It was reported that the Ottawa assessors did not provide any assistance

in the emergency rooms in their city (Dalziel, et al.). Another model focused on

the role of a single assessor completing a hospital based CGA (Principi, et al.,

1996). The authors suggested that their model of CGA with a single assessor

had advantages such as: time saving, decreased duplication in the completion of

the geriatric assessment, and decreased fatigue and confusion experienced by

the cognitively impaired, elderly client as compared to a client's experience when

multiple assessments are completed by 2 or more team members.

A variety of other team models with different health professionals

completing a home-based assessment are described in the literature. For

example, a geriatric assessment may have been completed in the community by

a nurse (Alessi, et al., 1997; Dalby, et al., 2000; Stuck, et al., 1993). Scanameo

and Fillit (1995) describe a model in which the geriatric assessment was

completed by a team of social worker, nurse, or nurse practitioner in the home. In

another study, the geriatric assessment in the community was completed by a

team complement of physiotherapist, social worker, and nurse, but there was no

Geriatrician on the team (Shah, Maly, Frank, Hirsch, & Reuben, 1997). Instead, it

was reported that the geriatric assessment team relied on the family physician to

follow their recommendations. The conclusions from the systematic review and

meta-regression analysis completed by Stuck, Egger, Hammer, Minder, & Beck

(2002), strongly supported a CGA in a home-based setting. The authors

reviewed seventeen articles that met their inclusion criteria and found that if

preventive home visits were based on a multidimensional CGA linked with long-

term follow-up, they were effective in improving survival and preventing functional

decline of elderly clients. In sum, the WRHA model of the GPAT program is

based in part on the programs like those described in the literature that include

community-based CGA designed to help maintain the function, independence,

and mobility of older adults living in the community, but the team complement is different.

Community-Based Comprehensive Geriatric Assessment

There are multiple benefits of CGA in the community. Home-based assessments often provide insight into older adult health and social issues that an office visit would not identify. For example, in the study by Scanameo and Fillit (1995), up to 85% of falls were reported to occur in the home. Therefore, completion of a home assessment may reveal possible reasons for the falls based on environmental risks or medication misuse. A detailed review of medications may alert geriatric clinicians to prescriptions that are not filled and a count of the pills can signal misuse, or polypharmacy. Medications are known to contribute to fall risks in older adults. Scanameo and Fillit reported that the detection of polypharmacy and environmental risks are important benefits of home visits. In a study by the Manitoba Centre for Health Policy, the Geriatric Program Assessment Teams in Winnipeg are suggested as a possible explanation for decreased rates of polypharmacy among the WRHA population over sixty-five years of age when compared to other regions in Manitoba (Martens & Fransoo, 2008). The GPAT clinicians and Geriatricians rigorous review of medications and recommendations for medication reduction whenever possible are cited in the report as a rationale for falls reduction among older adults in Winnipeg.

Another benefit of home-based assessment was related to the hospital environment, which is reported to frequently contribute to delirium or acute confusion in the elderly (Caplan, Williams, Daly, & Abraham, 2004). These

researchers stated that timely discharge home with follow-up in the community may reduce delirium, improve cognitive function, and increase client satisfaction. Moreover, elderly clients with difficulty mobilizing are less fatigued and more relaxed in their own home environment (Principi, et al., 1996). In addition, Principi et al. postulated that the hospital or office environment may inhibit elderly clients from asking questions that may be more easily discussed in their own home where the individual feels more confident and secure.

An essential portion of the WRHA community-based GPAT comprehensive multidimensional assessment includes observation of the functional abilities of the clients in their home environment, especially if cognitive impairment is detected. Assessment of the client's ability to move on and off the toilet, in and out of bed, in and out of the bathtub, and up and down stairs are all important components of the assessment as they provide insight into the reality of the client's management of basic ADL tasks. The GPAT comprehensive assessment consists of observation of the elderly client in their kitchen managing the stove and/or the microwave safely. The geriatric clinician also ensures that the client has food and other basic needs met. During the assessment, scrutinizing the fit of the client's clothing may identify nutritional difficulties, and the unkempt state of the clothing may identify hygiene needs or continence difficulties. Furthermore, the details of the assessment supply a more complete review of the client's functional ability in their own environment, which can be discussed with the physician or other health care providers. Thus, CGA with information on medication management, functional management in the home, and environmental risk factors have provided valuable information to care providers across the continuum of health

care. However, completion of a CGA in an ED environment often poses a greater challenge for health care professionals for a variety of reasons discussed below.

Emergency Department Geriatric Assessments

　　The literature identified a need for both community-based geriatric assessments (Dalby, et al., 2000; Dalziel, et al., 1992; Stuck, et al., 2002) and geriatric emergency room screening assessments (McCusker, Bellavance, Cardin, Trépanier, & Verdon, 1999). Several research studies discussed ED assessment tools or instruments that were developed specifically to identify elderly individuals who are at high risk of health and functional decline (Elie, Rousseau, Cole, Primeau, McCusker, et al., 2000; Mion, Palmer, Anetzberger, & Meldon, 2001). Furthermore, other research studies point out the importance of community follow-up for geriatric clients after ED presentation (Caplan, et al., 2004). However, there were no studies related to community-based assessment programs such as the GPAT program that also provide service to hospital Emergency Departments (EDs).

　　Disadvantages of the evaluation of an elderly client in the ED environment were emphasized by Hwang and Morrison (2007). They reported that the unaccompanied, elderly client with no advocate and possible delirium, dementia, or sensory impairments, had difficulty competing for attention when compared with younger, more vocal clients in busy EDs. Madden, Hogan, and Maxwell (2002) examined the prevalence of specific geriatric syndromes, which they described as having one or more of the following elements: confusion, falls, incontinence, caregiver stress, or failure to thrive. This study focused on clients

age seventy-five years and older presenting to EDs in Calgary, Alberta. They

suggested that clients with geriatric syndromes would benefit from a more

comprehensive, timely approach to care in order to detect the atypical

presentations of illness frequently not recognized, diagnosed, or treated in the

ED.

McCusker, et al., (1999), developed and evaluated the effectiveness of a

screening tool to identify high risk geriatric clients in the ED. They labelled their

tool the Identification of Seniors At Risk (ISAR) instrument. The ISAR was

validated using the Older American Resources and Services (OARS) instrument

(Hamilton, Granger, Sherwin, & Keith, 1987), the Activities of Daily Living (ADL)

scale (Alessi, et al., 1997; Dalby, et al., 2000; and Principi, et al., 1996) and the

Short Portable Mental Status Questionnaire (SPMSQ) (Pfeiffer, 1975). The

researchers concluded that the ISAR was valuable in detecting high risk geriatric

clients seen in the ED. However, this quick screen did not incorporate mobility

and stability assessments, which are considered by the GPAT program to be

integral components of a CGA.

In addition, a Canadian study by Élie, et al., (2000) reported that delirium

was under detected in elderly ED clients. Their study examined the number of

cases where delirium was detected by researchers in comparison to the number

of cases of delirium detected by the ED physicians. They utilized the MMSE

(Folstein, et al., 1975) and the Confusion Assessment Method (CAM) (Inouye,

van Dyck, Alessi, Balkin, & Siegal, 1994) to detect delirium in elderly ED clients.

Élie et al. found that approximately 10% of the elderly ED clients in their study had

a delirium and the rate of admission to acute care was greater for those

diagnosed with delirium. They reported that delirium was detected in 15 study

cases by researchers whereas only 9 of the 15 cases were detected by the ED

physicians. The diagnosis of delirium was especially under reported in hypoactive

individuals in the ED. Élie et al. point out that clients with dementia may be at

greater risk of developing a delirium, and EDs are important locations for

detection and initiating clinical management of delirium. In spite of this, consistent

use of screening instruments identifying clients with a delirium may not be utilized

in many EDs.

Other studies have investigated the provision of rapid screening

assessments in the ED and establishment of formal linkages to community

agencies for elderly clients returning home from the ED (Mion, et al., 2001). The

research by Mion et al. involved development of a Triage Risk Screening Tool

(TRST) designed to take only a few minutes for ED triage nurses to complete.

The TRST risk screening tool incorporated an important mobility question, but

was otherwise similar to the ISAR previously discussed. In fact, the investigators

used the ISAR as validation of their screening tool. The researchers reported that

the TRST was effective in determining those elderly clients at risk of returning to

ED or being hospitalized within a three month period following ED presentation.

They also noted that nursing staff within the ED found the TRST instrument easy

to use.

This first TRST study led to a follow-up study by Mion, Palmer, Meldon,

Bass, and Singer (2003). The focus of the latter study used the TRST to identify

high risk from low risk clients in the ED. The results of their study indicated that

intervention of a screening geriatric assessment in the ED and subsequent

connection to community agencies decreased nursing home admissions.

Another study by Caplan, Williams, Daly, and Abraham, et al., (2004) examined

the necessity of follow-up after presentation to the ED by high risk geriatric clients.

The hospital-based multidisciplinary geriatric team in their research used a

questionnaire in the ED that included: living arrangements, background of the

presentation to the ED, the Barthel Index of ADL (Mahoney & Barthel, 1965), a

modified instrumental ADL index, and a mental status questionnaire. The

assessment components used in this study were similar to those of the ISAR tool

developed by McCusker, et al. in 1999. Generally, a nurse followed the clients in

the community within 24 hours following discharge from the ED. After the nurse

reviewed the client issues, the hospital-based multidisciplinary team developed a

care plan. The hospital-based team consisted of a Geriatrician, Nurses,

Physiotherapists, Occupational Therapists, and Social Workers. This study

demonstrated that risk screening along with a multidisciplinary team follow-up

improved function and reduced unnecessary hospital admission for elderly

persons who were discharged from the ED (Caplan, et al., 2004).

Another study provided a comprehensive review of relevant articles

examining the effects of CGA, and identified geriatric management interventions

on ED use (McCusker & Verdon, 2006). A thorough search of MEDLINE and the

Cochrane database of clinical trials, bibliography search of relevant studies, and

consultation with colleagues formed the basis of their review article. Twenty-eight

articles met the inclusion criteria: 9 emergency department articles, 4 hospital-

based articles, 10 outpatient or primary care setting articles, 4 home care articles,

and one community article. The authors suggested that hospital interventions (ED or inpatient) usually consisting of short term assessment or liaison had little effect on future ED presentation. On the other hand, interventions conducted in outpatient or home-care settings were reported to be helpful in reducing ED utilization. The authors concluded that most community-based interventions included geriatric evaluation and management and as such, had an advantage over hospital programs by providing continuity of care.

Furthermore, community-based programs provide alternate locations to the ED for management of many acute problems experienced by the elderly. However, McCusker and Verdon (2006) pointed out the variability in the research methods they reviewed and recommended that future studies needed to use compatible methodologies and standardized measures to more accurately and consistently examine the effects of geriatric interventions on ED use. None of the research investigated screening older adults in the ED completed by specially trained geriatric clinicians such as the Geriatric Program Assessment Teams in Winnipeg for direct admission to GRUs.

Geriatric Program Assessment Team Clinicians in Emergency Departments

The WRHA Geriatric Program Assessment Team (GPAT) clinicians have been involved in community-based follow-up for clients discharged from EDs since 1999. Once the ED multidisciplinary team determine that an older client is safe to return home but at risk of future functional decline, the GPAT clinicians follow clients in their home to ensure that safety concerns are addressed. In particular, those elderly clients with multiple presentations to the ED are

highlighted as requiring GPAT intervention in order to prevent future ED presentation. The goal of geriatric community follow-up has been to ensure connection with appropriate community-based services to enable clients to remain in their home.

Mistiaen, Duijnhouwer, Wijkel, de Bont, and Veeger, (1997) suggested that older clients frequently rely on family and friends during the first week following discharge from the hospital. Similarly, one would expect that if a level of dependence was encountered by geriatric clients after a hospital stay, then geriatric clients discharged from emergency departments (EDs) may also require assistance from family and friends. Geriatric clinicians in the WRHA are aware that the support provided by informal caregivers such as family and friends following discharge are essential to successful health outcomes. Clients without formal or informal supports are often the clients who are followed by GPAT teams in the community. These older adults require closer scrutiny of their functional abilities such as meal preparation and grocery shopping to ensure that their basic needs are met after discharge from the ED.

The role of the WRHA geriatric clinician within the ED remains one of collaboration with the multidisciplinary team of physician, nurse, physiotherapist, home care coordinator, social worker, and occupational therapist once it has been determined that the client cannot return home. The ED geriatric assessments completed by GPAT clinicians are more abbreviated in this busy environment taking between thirty to sixty minutes to complete in comparison to a community assessment that may take two or three hours to complete. WRHA geriatric clinicians attend daily morning rounds in the ED from Monday to Friday. During

this time, GPAT clinicians review geriatric clients who are present in the ED.

However, many circumstances arise requiring the geriatric clinicians to return to

the ED later in the day. In these instances, the Rehabilitation and Geriatrics

Central Intake Coordinator for GPAT is contacted by the ED and in turn, the

clinician assigned to a specific ED is paged to notify them of the particular client

requiring geriatric assessment.

The geriatric clinician attends the ED and reviews documentation of the

consultations that are completed (eg., physiotherapy, occupational therapy, social

work), collects collateral information from the client and/or family members, and

examines laboratory and radiology reports in preparation for discussion with the

team Geriatrician. The GPAT assessment in the ED relies on assessments

completed by other health professionals and their opinion of the client status

completed during a brief assessment period. It is essential to have all client

information available for rapid decision-making regarding admission to inpatient

geriatric rehabilitation units or other recommendations. When portions of the

required information are not available, the GPAT clinician requests these

assessments or results prior to discussion with the Geriatrician and consideration

for geriatric rehabilitation admission.

Thus, the GPAT clinician plays a critical role in evaluating all aspects of the

individual's assessments in preparation for discussing the case with the

Geriatrician to ascertain whether the client is medically stable, and would benefit

from a geriatric rehabilitation inpatient admission. In addition, the GPAT clinician

discusses geriatric rehabilitation unit options with the client to ensure that they are

willing and able to participate. The discussion with the team Geriatrician occurs

over the telephone, while the GPAT clinician remains in the ED. If the Geriatrician

considers the client medically stable and appropriate for admission to geriatric

rehabilitation units, the GPAT clinician facilitates the transfer of the client from the

ED directly to geriatric rehabilitation units (GRUs). The direct transfer of selected

older adults from the ED to the GRU benefits the client because they receive the

type of care they require in a timely manner. Geriatric rehabilitation unit care

focuses on improving mobility and function with a goal of returning the client to

their baseline or improved functional level and to their previous home

environment.

Inpatient Comprehensive Geriatric Assessment and Management

Admission Criteria for Geriatric Rehabilitation Units

A number of studies have developed a set of criteria to determine who

would be an appropriate client for Comprehensive Geriatric Assessment (CGA),

specifically within an inpatient setting. For example, one study focused on

development of inclusion criteria to identify hospitalized patients appropriate for

hospital-based CGA inpatient units (Reuben, Wolde-Tsadik, Pardamean,

Hammond, & Borok, 1992). The study revealed that the most common inclusion

criteria for their inpatient CGA was incontinence that was either pre-existing or

developed after admission. In addition, impairment of mobility, ADL function, and

malnutrition followed closely as common inclusion criteria for the inpatient CGA

units (Reuben, et al.).

In a review of admission criteria for geriatric assessment and treatment

units, Wells, Seabrook, Stolee, Borrie, and Knoefel (2003) included additional

factors such as psychological function, social supports, and medical complexity. However, Wells et al. suggested that medically unstable, palliative, severely demented or independent clients should be excluded from admission to these specialized units because they would not benefit from the rehabilitation unit program. Based on the literature, it was advised that clients should have preadmission screening for rehabilitation potential prior to admission to geriatric rehabilitation units.

When considering selection criteria for geriatric rehabilitation units, the number and prognosis of the client's diseases or comorbidities should be included. For example, de Groot, Beckerman, Lankhorst, and Bouter (2003) completed a systematic review to evaluate the validity and reliability of thirteen available methods of measuring comorbidity. The results of their review found that the Charlson Index was the most extensively studied comorbidity index. The Charlson Index was developed several years ago by Charlson, Pompei, Ales, and MacKenzie (1987) in order to predict one year mortality of clients of any age. These researchers assigned nineteen disease conditions different weighted values based on the strength of their association with mortality. The Charlson Index combined with client age in years predicts mortality. De Groot, et al. (2003) concluded that the Charlson Index and three other indexes were valid and reliable methods to measure comorbidity.

A systematic review by Needham, Scales, Laupacis, and Pronovost (2005), had as one of their objectives to assess the agreement between the Canadian International Classification of Diseases, 9th Revision, Clinical Modification (ICD 9-CM) and a medical records review for Charlson comorbidity data. They reported

that the Charlson Index could predict in-hospital mortality but greater

discrimination was achieved when the severity of the illness was comprehended

(eg. end-stage disease as opposed to initial diagnosis of disease). The

researchers found that administrative databases generally under-estimated the

incidence of comorbidities when compared to a chart review (de Groot, et al.,

2003; Needham, et al., 2005). This was noted to be evident when the diagnosis

was asymptomatic during the hospitalization period. An example of under

reporting an asymptomatic diagnosis could occur when a client has a previous

history of gastric esophageal reflux disease (GERD) but was admitted to an

inpatient unit after emergency surgery for a fractured hip. There is a possibility

that the client's GERD diagnosis may be missed on the inpatient record or

database.

A second objective of the research by Needham, et al. (2005) was to

review other mortality risk adjustment methods versus comorbidity indexes. The

mortality risk adjustment methods they discussed included complex measurement

of the client's age, admission diagnoses, number and severity of comorbid

diseases, baseline functional status, socioeconomic, cultural, and ethnic

attributes. De Groot, et al., (2003) and Needham, et al. acknowledged that the

ICD-9 CM coded administrative databases were not designed for clinical research

and lacked clinical definitions for client diagnoses. They concluded that this was

one of the contributing factors causing variability in coding practices. Another

factor was that the ICD-9 CM coding was completed by chart abstracters in

several hospitals and the coding practices and accuracy may have varied from

site to site across a region. In sum, de Groot, et al. and Needham, et al.

concluded that medical record reviews were preferable for smaller studies in order to extract accurate diagnoses and severity of comorbidities. However, for larger group outcome studies, administrative databases such as the ICD-9 CM can provide valuable insights into the number and type of health conditions experienced by clients.

The admission criteria reported in the literature are consistent with those criteria considered for admission to GRUs in the WRHA. For example, the criteria utilized for WRHA geriatric rehabilitation unit admission have included: medical stability, admission diagnoses, other comorbidities, baseline function, present mobility, ADL function, formal/informal supports, polypharmacy, incontinence, depressed mood, and mild cognitive impairment. Geriatric rehabilitation units expect clients to participate in one to two hours of physiotherapy and/or occupational therapy throughout the day and increase the length of time as they move closer to discharge from the unit. Therefore, client motivation and ability to comprehend and benefit from the rehabilitation process are important factors when identifying clients for GRUs. Yet, the ability to consider all client dynamics for admission to inpatient GRUs in a busy ED remains more challenging where rapid decision-making is required. Therefore, the process of identifying clients who would benefit from a GRU admission becomes difficult for geriatric clinicians in an ED where the assessment process is abbreviated compared to acute care inpatient units where a more thorough evaluation can occur. The ED environment does not always allow time to determine client motiviation, attitudes, or ability to benefit from the rehabilitation process where the acute care unit does provide time for this evaluation.

Inpatient Geriatric Rehabilitation Units

The term geriatric evaluation and management unit (GEMU) was introduced by Rubenstein, Stuck, Siu, and Wieland, (1991) when comprehensive geriatric assessments (CGA) was combined with therapy (eg. physiotherapy, occupational therapy, etc.) in an inpatient setting. The meta-analysis by Rubenstein et al. sought to evaluate the effects of geriatric evaluation and management units on mortality. They described GEMU programs and examined the effectiveness of these types of programs in their study. Geriatric evaluation and management units provided multidimensional assessments that utilized measurement instruments to quantify the functional, psychological, and social strengths and constraints of individual clients. The GEMU teams assessed clients, interpreted the results of the assessments, and combined their expertise in order to work with the client toward common client-centred goals. In their review, the authors reported that the core GEMU team members consisted of physicians, nurses, and social workers with specialist occupational therapists, physiotherapists, audiologists, psychologists, pharmacists, dentists, and dietetics contributing as consultants for clients.

Although the goal of the initial meta-analysis by Rubenstein, et al. (1991) studied the effects of GEMUs on client mortality, several additional benefits from GEMUs were reported. These included: improved diagnostic accuracy, improved discharge placement, improved functional status, improved cognition, reduced use of medications, and prolonged survival of clients. Furthermore, Rubenstein, et al. found that 38% of GEMU clients were referred to long term care (LTC) institutions, 23% returned home, and 39% were able to manage in retirement

facilities with support. Although there was diversity among the programs that were reviewed, the most striking benefit was a reduction of mortality for inpatient GEMUs. Mortality continued to be reduced by fifty percent for GEMU clients at six months and one year post discharge. The authors concluded that a combination of client selection criteria and well-functioning assessment teams were contributing factors to the success of these specialized program units.

Other research articles point out similarities between inpatient geriatric rehabilitation unit (GRU) care. For example, Wells, et al. (2003) found that the geriatric rehabilitation units included in their review provided a multidisciplinary team trained in the care of the elderly with attention given to medical, psychosocial, mobility and functional issues. The inpatient multidisciplinary teams included a Geriatrician or geriatric medicine physician, nurses, social workers, occupational therapists, physiotherapists, speech and language pathologists, and psychologists.

Stuck, Siu, Wieland, Adams, and Rubenstein (1993) conducted a meta-analysis of geriatric assessment controlled trials. This was done because there were conflicting results from individual trials in relation to the usefulness of CGA. It was noted that various studies differed in their patient-targeting approach and some of the studies found that the geriatric intervention team lacked medical control over the implementation of recommendations. On the other hand, the meta-analysis completed by Stuck et al., (1993) found that meaningful improvements in the function of frail elderly clients could result from comprehensive geriatric inpatient care. The authors discussed the importance of the multidisciplinary approach in determining each older person's biomedical,

psychosocial, and environmental needs in order to plan an appropriate and successful discharge. In addition, they reported that inpatient geriatric units were shown to reduce readmissions, lower mortality, improve cognition, and improve functional status of the clients.

Researchers often used the term "frailty" to describe clients who were admitted to GRUs (Stuck et al., 2003). Frailty was defined by Stuck et al. as being "more than simple dependence for activities of daily living (ADLs). It is a complex interplay of a person's assets and deficits, including health and illness, attitudes, practices, resources, and dependence on others." (pg. 891). The client's attitude and motivation to participate in the rehabilitation process has an impact on the potential discharge outcome that can be achieved (Toth, 1989; Wells et al., 2003). However, client attitude and motivation is difficult to determine when assessing the client in the ED environment. Therefore, it is important to establish client-focused goals prior to GRU admission and during the initial phase of their geriatric rehabilitation program. The establishment of well-defined, client-focused goals for rehabilitation that include the patient and their caregivers whenever possible is essential to the rehabilitation process (Wells, et al.).

As several studies reported, comprehensive geriatric assessment inpatient programs linking geriatric evaluation and strong long-term management were effective in improving survival and function in elderly persons enabling them to return to their homes in the community (Stuck et al., 1993; Wells, et al., 2003). The ultimate goal of discharge planning reiterated in the inpatient geriatric rehabilitation unit research was to achieve a discharge of the client back to their home whenever possible. In Winnipeg, discharge planning for those high risk

clients from GRUs and EDs frequently includes a referral to the Geriatric Program Assessment Teams (GPATs) and other community resources to ensure that discharge plans are followed and clients remain safe in their home environments. Therefore, an outcome of discharge home is considered a positive outcome indicating effective client selection criteria for admission to a GRU.

Summary

The literature consistently supports both community-based geriatric assessments (Dalby, et al., 2000; McCusker & Verdon, 2006), and geriatric emergency room screening assessments (McCusker, et al., 1999, Caplan et al., 2006) to ensure positive outcomes for older adult patients. However, there is a paucity of literature related to community-based programs, such as the WRHA GPAT program, that also provide geriatric service and selection of patients for GRUs in hospital emergency departments. Several research studies discussed geriatric screening assessment tools that can be utilized in EDs to detect individuals who are at high risk of health and functional decline (McCusker, et al., 1999; Mion, et al., 2003). In addition, some research emphasized the need for geriatric multidisciplinary interventions (eg., physiotherapy and occupational therapy) in the ED, as well as community-based follow-up after presentation to the ED (Caplan et al.). No information was found that reports on programs like GPAT, that provide the evaluation, selection, and facilitation of direct admission from the ED to geriatric rehabilitation units.

Geriatric rehabilitation client selection criteria was fairly consistent in the research reviewed and included the following client characteristics: medical stability, ability to comprehend and participate in rehabilitation, admission diagnoses, comorbid disease severity, baseline function, social supports, dependence, client motivation, and attitudes. The research supported the importance of the specialized care and client-focused discharge planning provided on geriatric rehabilitation inpatient units as essential links to positive client outcomes. In addition, the necessity for long-term community follow-up to improve and maintain function in older adults following discharge from these specialized units was emphasized.

However, there was a void in the literature examining the discharge outcomes of clients admitted directly from busy EDs after they received geriatric rehabilitation inpatient unit care. This is especially important to examine given the brief time provided for an ED assessment where there is greater potential for medical illness to be undetected. The ED environment does not always allow thorough preadmission evaluation for a GRU including assessment of client motivation and attitudes toward the rehabilitation process. Collateral information is always sought while clients are in the ED but there are instances when this valuable information cannot be obtained. Some clients presenting to EDs have no formal or informal supports available to provide information regarding previous functional status, psychosocial supports, and prior management at home. Although the same selection criteria are utilized in EDs as in acute care inpatient units, there are often fewer diagnostic tests and specialist consultations completed in an ED where rapid decision-making regarding a GRU admission is required.   Therefore, it is important to study the discharge outcomes of

the ED clients who receive direct transfer to GRUs compared to the discharge outcomes of acute care inpatient unit clients where multiple consultations and diagnostic tests are completed prior to making a decision to transfer clients to a GRU.

Study Purpose

The purpose of this research study is to compare the discharge outcomes of two client groups after discharge from geriatric rehabilitation units. The two groups are:

- ED Group: older adults assessed by GPAT clinicians in the ED and admitted directly from the ED to an inpatient GRU

- Acute Group: older adults assessed by "specialist physicians" on inpatient acute care units and admitted to an inpatient GRU

Research Objectives

The research objectives are to determine if selection of geriatric rehabilitation clients can be accomplished in ED environments where assessment and selection time is abbreviated compared to acute care environments where time allows for a more thorough preadmission screening of clients prior to admission to inpatient geriatric rehabilitation units. The research questions are:

1. What are the discharge outcomes for older adults admitted directly to GRU from EDs who have been assessed by GPAT clinicians compared to older adults admitted from other inpatient acute care units to geriatric rehabilitation units?

    o The discharge outcomes under investigation in this study are:

        I. Discharge home

      II. Discharge to PCH

      III. Poor outcome (medical instability or mortality)

2. What is the association between length of stay, age, sex, ED Group, or Acute Group with the discharge outcomes achieved?

Rationale

The primary research questions have clinical relevance because EDs provide a brief opportunity for the thorough evaluation and selection of geriatric clients for admission to geriatric rehabilitation units. Selection of clients in an ED environment where a delirium or other illness may not be identified, increases the risk of a poor outcome of medical instability or mortality for clients admitted directly from an ED to a GRU (Élie, et al., 2000). This is a neglected area of research related to GRUs discharge outcomes. The GPAT program has limited resources to provide geriatric service to both community-dwelling clients and the WRHA Emergency Departments. Therefore, it would benefit the program to know that the ED resource allocation provides effective selection of geriatric rehabilitation clients in a less than ideal environment. This research study will add to the research literature and provide valuable information regarding indicators that may assist with future selection of geriatric rehabilitation clients. Furthermore, this study will help to inform best practices adopted by the Geriatric Program Assessment Team services.

Hypotheses

The standard system for selection of geriatric rehabilitation clients integrates a process whereby clients are admitted first to medical or surgical units with adequate time for accurate diagnoses and medical treatment as required prior to transfer to a GRU (Rubenstein et al., 1991). Thus, client information is thorough and complete for both medical and surgical patients when compared to clients admitted to a GRU directly from emergency departments. There are no studies examining ED direct admission issues.

When clients are admitted to a medical or surgical unit, the clients have time to stabilize medically; they receive further diagnostic tests with specialist consultations prior to determining that the client is ready to transfer to a GRU. However, when the client evaluation is completed in a busy emergency department (ED), time does not permit numerous diagnostic tests or consultations. The GPAT clinician, in communication with the team Geriatrician must make a relatively quick decision regarding direct transfer to a geriatric rehabilitation unit with minimum basic assessment and diagnostic information available. Therefore, one might anticipate that the ED Group may have poorer outcomes in relation to medical instability or mortality and greater frequency of Personal Care Home placement than the Acute Group.

Limitations

This quantitative research study used administrative data to compare two client groups. Administrative databases may provide valuable information but the investigator must understand the program processes in order to properly filter unwanted information, to improve internal validity and reliability of the data. Databases provide limited information and in particular, the ICD-10 database provided minimal diagnostic information regarding GRU clients in this study. This factor disallowed consideration of multiple client comorbid diseases for the specific client cases studied.

In Winnipeg, the geriatric rehabilitation units are located in four different facilities. Two of these geriatric rehabilitation units are located in facilities that also have acute care and emergency departments. Two of the GRUs are located in facilities that do not have an ED and acute care units. Therefore, transfer to the geriatric rehabilitation unit with the ED attached was an internal transfer while those units located in facilities without an ED required an external transfer from another facility. These differences may have caused variance in the internal validity of the data.

In addition, data collection and data entry occurred at four separate health care centres, which could have caused inconsistencies in coding practices from one facility to another. This may have affected the internal validity and reliability of the study data. Moreover, GRU staff attitudes and vacancies during a particular period of time would differ from site to site across the region. Variables in staffing are features that could affect the length of stay and the discharge

outcomes when comparing study client groups. Furthermore, discharge

outcomes may be affected by client characteristics such as client motivation and

comprehension during rehabilitation, and these factors are not captured in a

database. The factors that could differ between geriatric rehabilitation units and

client case attitudes are a threat to internal validity, but cannot be controlled in this

research.

Chapter 3: Methodology

Study Design

Data Sources and Case Selection

The study design was a retrospective research investigation using administrative data from the WRHA Rehabilitation and Geriatrics (R&G) program to investigate outcomes of GRU clients admitted to a GRU directly from EDs and those admitted from acute inpatient units to a GRU. The data was extracted from three databases used by the program, namely: the R&G Central Intake database, the R&G Coordinated Entry database, and the WRHA International Classification of Diseases-10 (ICD-10) database. The R&G Central Intake database provides information about all clients seen by GPAT clinicians specifying whether the case was ED or community-based involvement. For the purpose of this research study, only the ED client cases were extracted from this database.

The Rehabilitation and Geriatrics (R & G) Coordinated Entry database provides information about all clients regardless of age, placed on the R & G waiting list for transfer to any rehabilitation inpatient beds in the region. Clients are placed on the Coordinated Entry list after specialist consultation and a waiting list form are completed. The forms include information on the patient diagnoses, location, and reason for admission to a rehabilitation unit for each client. This database denotes which type of rehabilitation unit was requested (e.g., geriatric, spinal cord, amputee). It also provides information including the name, Personal

Health Information Number (PHIN), date of birth, and where and when a client was transferred to a regional rehabilitation inpatient bed. Data was entered into this database by administrative coordinators after geriatric clinicians or other specialists provide the information details. For this study, only clients age 65 years and older admitted to geriatric rehabilitation units were extracted from the R&G Coordinated Entry database.

The International Classification of Diseases -10 (ICD-10) databases were endorsed by the forty-third World Health Organization Assembly in 1990 (http://www.who.int/classifications/icd/en/). It historically provided mortality information but through the years, ICD versions have provided standard classifications for general epidemiology, health management, and clinical use. The ICD-10 database used by the WRHA provided client disposition information for all hospitals in the region and other jurisdictions. For this research study the following information was obtained from the ICD-10 database: date of birth, age, sex, GRU site, length of stay, discharge outcome (home, PCH, return to acute care, mortality), most responsible reason for admission to rehabilitation, primary diagnostic description, and secondary diagnostic description.

The results of the ICD-10 extraction of the most responsible reason for admission, primary diagnostic description, and secondary diagnostic description were not clinical diagnoses. For example, the most frequent reason for admission was "other physical therapy" or "care involving rehabilitation services" and the most common primary diagnostic description was "factors influencing health status and contact with health services". Therefore, in order to further examine group characteristics, in terms of health problems, an ED Group and an Acute

Group sample of health problems were extracted from the R&G Coordinated Entry (waiting list) database. Unfortunately, the resulting 2006 ED and Acute group health problems sample could not be linked accurately to specific client cases. Although the health problems were primarily geriatric rehabilitation admission health problems and could not be linked with individual clients they provided additional descriptive information about the ED Group and Acute Group characteristics in this study. The health problems provided to the R&G Coordinated Entry database were not coded by trained staff as was the ICD-10 database. Instead, the admission health problems were provided to the R&G Coordinated Entry database by geriatric clinicians or specialists who completed the client assessment.

Clients were linked to all three databases in order to extract the data to be analyzed. All geriatric rehabilitation admission data from January 1 to December 31, 2006 was used. Data from the R&G Central Intake database and the R&G Coordinated Entry database were retrieved by the WRHA Rehab & Geriatrics Health Information Coordinator and privacy officer for the program. Then the Rehabilitation and Geriatrics data was linked to the ICD -10 database through the WRHA Division of Research and Applied Learning.

The data was manually quality checked numerous times by cross-referencing the ED and Acute clients Personal Health Information Number (PHIN), name, and date of birth across the three databases to ensure accuracy of the data. After ensuring data integrity, all personal identifying information was removed and cases were assigned a research identification (ID) number. Throughout the remainder of the analysis, all clients will be referred to as cases.

Inclusion Criteria

The following inclusion criteria were utilized for this study:

- Cases age 65 years or older

- Cases admitted to any of the four WRHA Geriatric Rehabilitation Units that are located in St. Boniface General Hospital, Seven Oaks General Hospital, Riverview Health Centre, and Deer Lodge Centre

- Cases admitted to the geriatric rehabilitation units between January 1, to December 31, 2006

- Cases discharged by December 31, 2007. This discharge date was chosen to allow for accurate collection of cases with long stays past December 31, 2006, or cases admitted to a geriatric rehabilitation late in December 2006

Ethics

Ethics approval was received from the University of Manitoba, Health Research Ethics Board (see Appendix A) and the WRHA Research Division (see Appendix B) prior to obtaining release of the administrative research data. The release of the administrative data required a WRHA Health Information request form (see Appendix C). The WRHA remained the trustee of the data and extraction of the data was done by two WRHA employees.

The research study was one of minimal risk because it used secondary administrative data. The primary ethical concern was protection of personal health information and confidentiality of the data. The data used was locked in a

file cabinet in the researcher's locked office. The computer that was used

remained locked in the researcher's office and was password protected as were

all external drives. As noted earlier, prior to analysis, all personal identification

was removed and cases were assigned a research identification (ID) number. All

data was documented in an aggregated format to protect the identity of the client

cases. The aggregated written results of this research study will be shared with

the WRHA Rehabilitation and Geriatrics program but there will be no access to

the personal health information of individual cases. The data will be retained for a

period of three years. All paper copies of the data will be shredded according to

procedures outlined by the University of Manitoba, WRHA, and Deer Lodge

Centre because the research office was located within Deer Lodge Centre.

Variable Coding

   The following steps were utilized to prepare the data for statistical analysis:

- Study Groups were coded as ED Group=1 and Acute Group=0

- Age was entered in years and was recoded into two age groups (65-84
  years=0) and (85 years or older=1)

- Sex was coded as Male=0 and Female=1

- Discharge Outcomes were coded as follows: Discharged Home (Yes=1,
  No=0); Discharged to PCH (Yes=1, No=0); Returned to Acute Care
  (Yes=1, No=0); Mortality (Yes=1, No=0)

- For additional analyses, discharge outcomes were re-coded: (Home=1),
  (PCH=2), (Medical instability=3), (Mortality=4)

- Total Length of Stay (LOS) from the date of admission to hospital to the date of discharge outcome was utilized for all Length of Stay comparisons. All (LOS) were entered in days and re-coded as follows: (0-29 days=1), (30-59 days=2), (60-89 days=3), (90 days or higher= 4) to examine potential influence of LOS on discharge outcomes

- Discharge Facility was coded as: Site 1, Site 2, Site 3, or Site 4

- The R&G Coordinated Entry database provided a record of health problems for the ED Group and Acute Group that were extracted for analysis

- The health problems were coded in a similar method to Weinberg, (2000) (Present =1) and (Not Present =0) as follows:

    1. Falls

    2. Weakness or de-conditioning

    3. Mobility problems (e.g., difficulty with weight-bearing or transferring and mobility problems)

    4. Pain

    5. Mental status problems (e.g., cognitive impairment, dementia, depression, anxiety, hallucinations)

    6. Medical illness (e.g., infection, biochemical imbalances, renal problems, gastro-intestinal problems, diabetic problems)

    7. Fractures

    8. Cardiac problems

    9. Respiratory problems

10. Neurological problems (e.g., cerebral vascular accident,

    Parkinson's Disease)

11. Orthopedic problems (e.g., any musculoskeletal problem other than

    fractures)

12. Surgery

13. Coping difficulties or failure to cope

Data Analysis

SPSS version 16 (www.spss.com) was utilized to conduct all analyses.

Initially, frequencies on all variables to determine ED and Acute group

characteristics were assessed separately to determine the mean age, length of

stay, sex, and discharge outcomes. Subsequently, Pearson's chi- square

crosstabulation analyses were conducted to assess potential differences between

the ED and Acute groups. The health problems of the ED Group and the Acute

Group were examined in a separate frequency analysis to obtain the range and

mean number and SD of health problems of the two groups. The health problems

of the two groups were also examined using Pearson's chi-square analyses to

detect significant differences in the prevalence of health problems between

groups. In addition, Pearson's chi-square crosstabulation analyses were

conducted to discern any significant differences regarding discharge outcomes in

relation to the independent variables of site, age, sex, or length of stay. Finally,

four logistic regression models were conducted to more specifically examine

which variables influenced the ED and Acute group discharge outcomes.

The following steps were conducted in these analyses:

A.   Frequency Analyses:

1.   Discharge outcomes for the number of cases discharged home, number of cases discharged to PCH, number of cases returned to acute care, and mortality in the ED Group and Acute Group

2.   Health Problems by ED Group and Acute Group

- Independent t-tests were conducted to examine equality of the group means

B.   Group Characteristics:

1.   Separate ED Group and Acute Group frequency analyses were conducted to examine age, sex, site, and LOS

- Independent t-tests were conducted to examine potential differences in group characteristics

C. Pearson's chi-square correlation analyses were conducted to compare significant differences between the group characteristics for the following:

1.   Discharge Outcome by ED Group and Acute Group

2.   Health Problems by ED Group and by Acute Group

D. The discharge outcomes of "return to acute care for medical instability" or "mortality" were collapsed and re-coded as "Poor Outcome" due to insufficient cell size in the ED Group (n=4)

E. ED Group and Acute Group discharge outcome groups were merged into a Combined Group (n=630) in order to further evaluate group characteristics of age, sex, LOS, GRU site, and ED/Acute group that had association with discharge outcomes

F. Logistic Regression was conducted according to the following models:

- **Model 1a:** This model revealed what factors were significantly associated with discharge "Home" versus discharge to "PCH/Poor" outcomes (n=630). The discharge outcome/dependent variable was coded (1= Home), and PCH/Poor categories were combined (0= PCH/Poor) as there is only an option to compare 2 groups in logistic regression. All variables were coded sex (Male=0, Female=1), Age (65-84=0, 85 and older=1), LOS (0-29=1, 30-59=2, 60-89=3, 90+=4) and Group (Acute=0, ED=1). **Model 1b:** The same coding was used but logistic regression was conducted by ED Group and Acute Group.

- **Model 2:** Outcome/dependent variables were coded (1= Home, 0= PCH). All independent variables were sex (Male=0, Female=1), Age (65-84=0, 85 and older=1), LOS (0-29=1, 30-59=2, 60-89=3, 90+=4) and Group (Acute=0, ED=1). This model revealed which factors were significantly associated with discharge "Home" versus discharge to "PCH" and all discharge outcomes of "Poor" were not included

- **Model 3:** Outcome/dependent variables were coded (1= Home, 0= Poor). All variables were coded the same as Model 2. This model illustrated which factors were significantly associated with discharge "Home" compared to "Poor" outcome, and those discharged to PCH were excluded from this analysis

o **Model 4:** Outcome/dependent variables were coded (1=PCH, 0=Poor). All variables were coded the same as Model 2. The results of this model indicated which factors were significantly associated with a "PCH" discharge compared to a "Poor" outcome and those cases discharged "Home" were not included in this analysis.

Chapter 4: Results

Group Characteristics

The total number of geriatric rehabilitation cases included in the discharge outcome study was 630. One hundred and forty-one or almost one quarter of the total cases were ED Group cases, and 489 or just over three quarters were Acute Group cases.   Frequency analyses of age, sex, LOS, site, and discharge outcomes were conducted separately for both groups (see Table 1). The mean age was almost identical for both groups. Although t-tests revealed no significant difference between mean LOS of the groups this data is not normally distributed and the large SD was noted (see Table 1). However, the median LOS for each group was almost identical with 42 days in the ED Group and 43 days in the Acute Group. When discussing LOS, median values are utilized to accomodate extremely high and low length of stay values.

Further t-tests were conducted for sex and GRU site. A significant difference in sex was revealed between the two groups. There were significantly more females in the ED group than the acute group (p <.05). Females represented three quarters of the ED group and almost two thirds of the acute group. However, sex was not a significant factor on the discharge outcome of either group.

Table 1: Analysis of Group Characteristics

	ED Group n=141		Acute Group n=489		Combined n=630	
	n	(%)	n	(%)	n	(%)
Sex*						
Female*	106	(75.2)	320	(65.4)	426	(67.6)
Male	35	(24.8)	169	(34.6)	204	(32.4)
Discharge Outcome						
Home	99	(70.2)	334	(68.3)	433	(68.7)
PCH	33	(23.4)	105	(21.5)	138	(21.9)
Poor	9	(6.4)	50	(10.2)	59	(9.4)

Mean and SD: Age and Length of Stay

Age in Years

Mean ± SD	83 ± 7	82 ± 7	82 ± 7

Total Length of Stay in Days (LOS)

Mean ± SD	66 ± 72	57 ± 46	58 ± 54
Median	42	43	43

Note: ED = Emergency Department; PCH = Personal Care Home; Poor= Became medically unstable or died
* $p<.05$

GRU Site Discharge Outcomes

Frequency analysis related to the GRU site showed that there were differences in the number of direct ED Group admissions to a GRU by site. Site 1 and Site 2 admitted fewer cases of the ED Group to a GRU whereas Site 3 and Site 4 admitted a greater number of cases of the ED Group to a GRU. However, Site 1 and Site 2 admitted a greater number of Acute Group cases to the GRU. Interestingly, the sites which had an ED attached to the GRU site accepted fewer ED Group cases. Chi-square analysis was conducted on the GRU sites and the discharge outcomes of cases from those sites. No statistically significant differences were found between GRU sites and the discharge outcomes obtained by the ED Group and Acute Group combined (see Figure 1). Therefore, GRU sites were not further analyzed in logistic regression.

Figure 1: Site Specific Discharge Outcomes of Total GRU Cases (n=630)
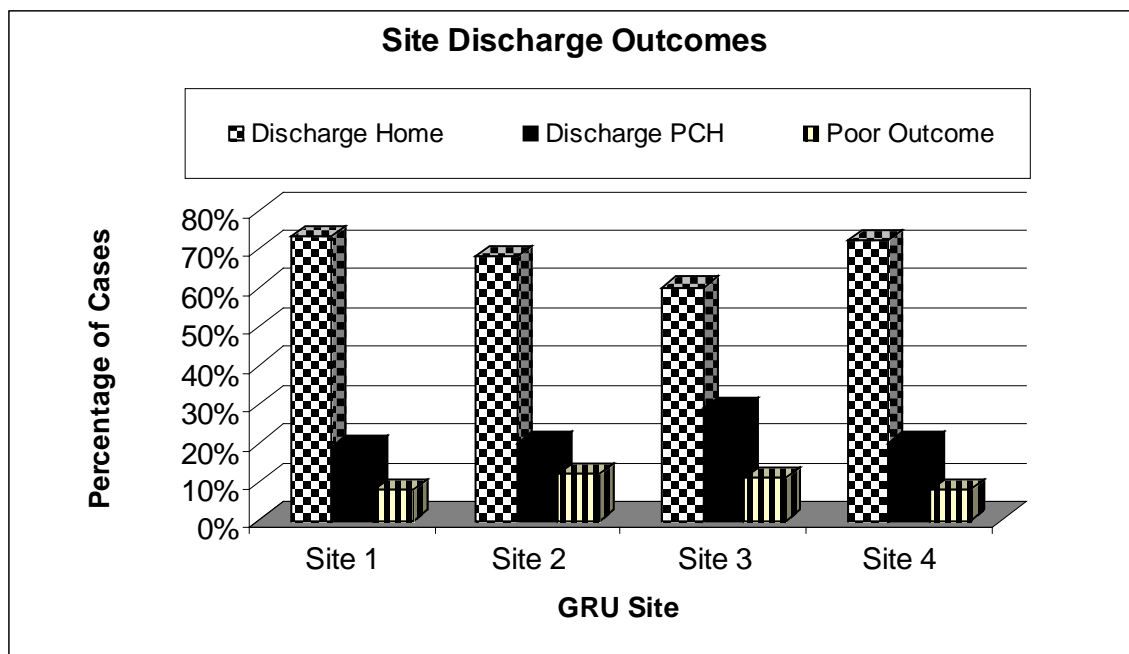
Chi-Square Analysis: Discharge Outcomes

The ED and Acute groups were combined for further analyses. Analysis of the total cases (n=630) revealed that almost 62 percent fell into the age category of 65 to 84 years and 38 percent of cases were in the 85 and older age category (see Table 2). With respect to LOS, over 32 percent of the total cases had a zero to 29 day stay, whereas almost 18 percent of cases had a stay of 90 days or more. Subsequently, "PCH" and "Poor" outcomes were collapsed into one category to increase the power of the chi-square analyses and also to compare a good outcome of "discharged Home" with poor outcomes of "PCH/Poor". Chi-square analyses were conducted for the two discharge outcomes by sex, age group, LOS group and ED Group or Acute Group. As Table 2 illustrates, age group was a statistically significant factor on discharge outcome with a Pearson's chi-square value of 4.236, 1df (p <.05). Length of stay was statistically significant related to discharge outcome with a Pearson's chi-square value of 1.824, 3df, (p< .0001).

Chi-square analyses revealed that there were statistically significant factors that impact discharge outcome (eg., age group and LOS group). However, there was no statistical significance found between the ED Group and the Acute Group and the discharge outcomes examined. Therefore, we can accept the null hypothesis, that there is no difference between the ED Group and the Acute Group in discharge outcomes between "Home" and "PCH/Poor" (see Table 2). In order to further examine specifically which age groups or length of stay factors had significant association with discharge disposition, logistic regression analyses were conducted.

Table 2: Chi-square Analysis: Discharge Outcome Characteristics: (n=630)

Characteristics	Discharge Outcome					
	Home		PCH & Poor		Total	
	n	(%)	n	(%)	n	(%)
Sex						
Male	137	(67.2)	67	(32.8)	204	(32.4)
Female	296	(69.5)	130	(30.5)	426	(67.6)
Age*						
65- 84	279	(71.7)	110	(28.3)	389	(61.7)
85 + older	154	(63.9)	87	(36.1)	241	(38.3)
LOS***						
0-29 days	172	(83.9)	33	(16.1)	205	(32.5)
30-59 days	161	(82.6)	34	(17.4)	195	(31.0)
60-89 days	68	(57.1)	51	(42.9)	119	(18.9)
90 + days	32	(28.8)	79	(71.2)	111	(17.6)
Group						
ED	99	(70.2)	42	(29.8)	141	(22.4)
Acute	334	(68.3)	155	(31.7)	489	(77.6)

Note: PCH=Personal Care Home; LOS=Length of Stay

*p<.05; ***p<.0001

Health Problem Group Characteristics

Prior to completion of the logistic regression analyses, ED Group and

Acute Group characteristics were further analyzed through examination of group

health problems. This secondary analysis added to the description of the two

groups (see Table 3). The health problems extracted from the Rehabilitation and

Geriatrics Coordinated Entry database was based on a total of 509 cases from

the same year (2006) as the 630 discharge outcome cases, however, the health

problems could not be linked to specific clients. Distribution between the ED and

Acute Group health problems was similar to the ED and Acute Group discharge

outcome distribution. As mentioned in *Group Characteristics* on page 44, the ED

Group represented almost one quarter of the total discharge outcome cases. The

distribution of the ED Group health problems also represented almost one quarter

of the total health problems and the Acute Group represented over three quarters

of the total health problems. There was no significant difference between the two

groups in the mean number of health problems (see Table 3).

Significant findings noted in the health problems of the ED Group were as

follows (see Table 3): a higher prevalence of falls with Pearson's chi-square

15.960, 1df (p<.0001) and weakness with Pearson's chi-square 8.328, 1df (p< .001)

when compared to the Acute Group. Conversely, the significant findings of the

Acute Group were as follows: a higher prevalence of medical illness with Pearson's

chi-square 24.494,1df (p< .0001) and cardiac problems with Pearson's chi-square

16.093, 1df (p< .0001) when compared to the ED Group. Although not significant,

the ED group was more likely to experience pain than the acute group. There were

too few surgery cases in one of the ED group cells (n=1) to conduct chi-square

analysis. However, there were a greater number of surgery cases in the acute

group (n=66).

Table 3: Health Problems by Group

Health Issues	ED Group n=117		Acute Group n=392		Combined n=509	
	n	(%)	n	(%)	n	(%)
Falls***	59	(50.4)	119	(30.4)	178	(35)
Weakness**	40	(34.2)	83	(21.2)	123	(24.2)
Mobility Problems	44	(37.6)	102	(26)	146	(28.7)
Coping Problems	5	(4.3)	12	(3.1)	17	(3.3)
Pain	21	(17.9)	44	(11.2)	65	(12.8)
Medical Illness***	26	(22.2)	188	(48)	95	(18.7)
Neurological Issues	19	(16.2)	58	(14.8)	77	(15.1)
Cardiac Issues***	7	(6)	88	(22.4)	95	(18.7)
Respiratory Issues	3	(2.6)	27	(6.9)	30	(5.9)
Orthopedic Issues	30	(25.6)	62	(15.8)	92	(18.1)
Any Surgery	1	(.9)	66	(16.8)	67	(13.2)
Fractures	17	(14.5)	68	(17.3)	85	(16.7)
Mental Status Issues	25	(21.4)	73	(18.6)	98	(19.3)
Health problem range	0 – 5		0 – 6		0 - 6	
Mean ± SD	2.47 ± 1.13		2.49 ± 1.00		2.47 ± 1.13	

** $p < .001$ *** $p < .0001$

Significant differences in health problems between the ED Group and the
Acute Group are demonstrated in Figure 2. Fifty percent of the ED Group
experienced falls and 34% experienced weakness. In contrast, the Acute Group
had a greater percentage of medical problems (48%) and cardiac problems (22 %).

Figure 2: Significant Health Problems by Group
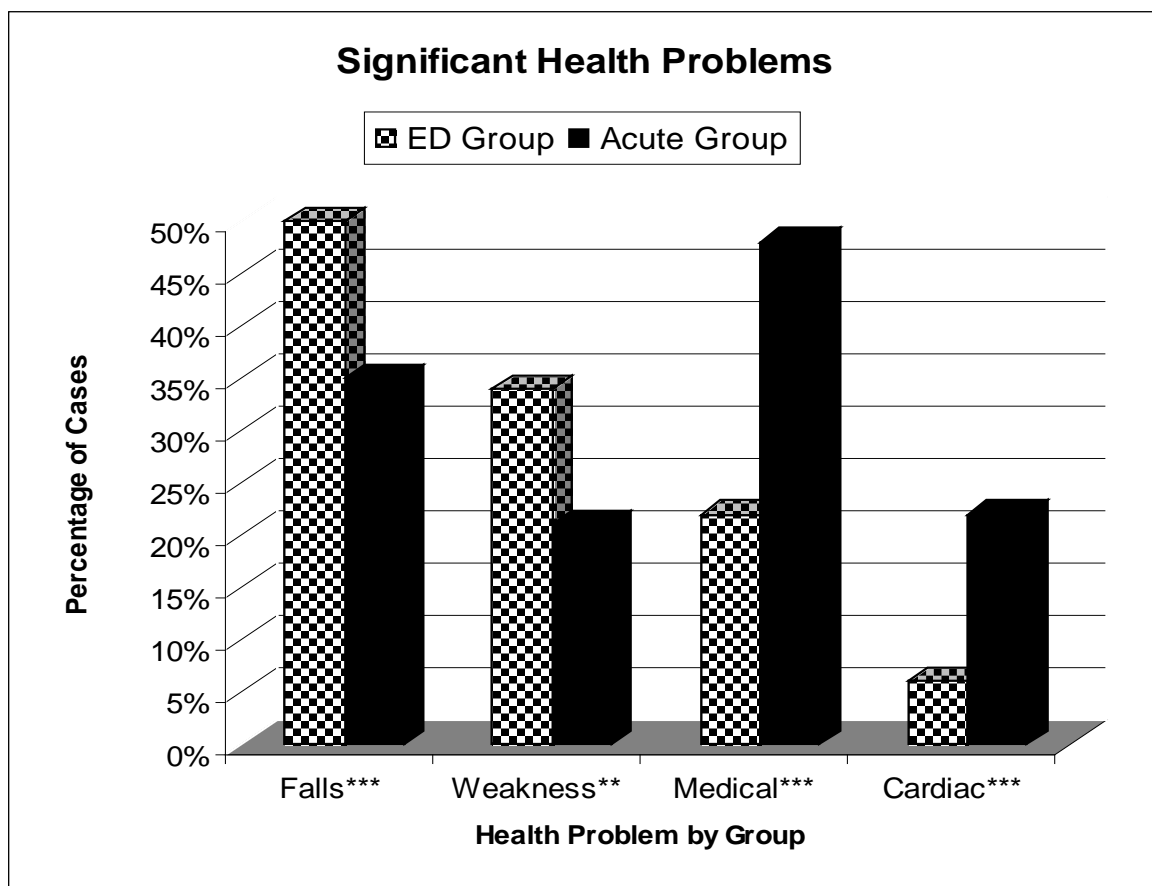
Note: Only statistically significant health problems are included
** p< .001; *** p< .0001

Logistic Regression Analyses

The study objectives were to investigate specific outcomes of two distinct groups. The chi-square analysis revealed statistically significant factors and subsequent logistic regression analyses were conducted to allow more detailed examination of the two groups and their discharge outcomes and what factors were associated with discharge home. A series of logistic regression models were conducted and are reported below.

Model 1a: Factors Associated with Discharge Home versus PCH/Poor Outcomes

Logistic regression of the total group (n=630) was conducted with the outcome of discharge home as the reference/comparison variable and PCH and Poor outcomes were collapsed into one category for the analysis (see Table 4). There was no statistical significance found between sex or age group and the discharge outcome disposition of cases (see Table 4). However, those with a shorter length of stay of zero to 29 days had almost 14 times greater probability of being discharged home. Those with a LOS of 30 to 59 days had almost 12 times greater probability of returning home, and even those with 60 to 89 days LOS had over three times greater probability of returning home when compared to the over 90 day length of stay cases. Importantly, there was no significant difference found between the ED Group and the Acute Group and the discharge home outcome. The results show that cases in the shorter length of stay groups of one to two months had a statistically significant likelihood of returning home for both ED and Acute Groups (p <.0001).

Table 4: Logistic Regression Model 1a: Factors Associated with Discharge Home versus PCH/Poor Outcome (n= 630)

Characteristics	Odds Ratio	95% Confidence Interval
Sex		
Male	(comparison group)	
Female	1.25	.83 - 1.90
Age		
65- 84	(comparison group)	
85 + older	.680	.46 – 1.01
Length of Stay		
0-29 days	13.5***	7.47 – 22.81
30-59 days	11.70***	6.7 – 20.38
60-89 days	3.44***	2.0 – 6.0
90 days + over	(comparison group)	
Group		
Acute	(comparison group)	
ED	1.07	.67 – 1.69

*** p<.0001

Model 1b: Factors Associated with Discharge Home by Group

The goal of all geriatric rehabilitation programs focuses on returning individual cases to their previous function and whenever possible, their home environment. Therefore, logistic regression was conducted using the dependent variable of discharge home as the comparison and variables of sex, age group, and LOS group were analyzed by ED Group and Acute Group to further examine factors associated with discharge home by group (see Table 5). The logistic regression analysis indicated that Acute Group cases age 65 to 84 were more likely to be discharged home when compared to the cases age 85 and older with an odds ratio of .62 and Confidence Interval of .40-.97,(p<.05). As Table 5 demonstrates, the shorter LOS cases (0-29 and 30-59 days) were far more likely to be discharged home when compared to the LOS of 90 or more, but this was similar in both the ED and the Acute Groups. Sex had no significance on the discharge outcomes. An interesting finding in the ED group is that those cases with 30 to 59 day LOS were more likely to return home (OR 19.91, CI 5.47-72.5) than the shorter length of stay from zero to 29 days (OR 17.92, CI 5.09-63.06).

Table 5: Logistic Regression Model 1b: Factors Associated with Discharge Home by Group (n=630)

Characteristics	ED Group		Acute Group	
	OR	(95%CI)	OR	(95%CI)
Sex				
Male	(comparison group)			
Female	1.91	(.70-5.18)	1.14	(.72-1.81)
Age				
65- 84	(comparison group)			
85 + older	.87	(.35-2.15)	.62*	(.40-.97)
LOS				
0-29 days	17.92***	(5.09-63.06)	12.08***	(6.46-22.58)
30-59 days	19.91***	(5.47-72.50)	10.54***	(5.67-19.61)
60-89 days	2.23	(.68-7.30)	4.02***	(2.14-7.56)
90 days + over	(comparison group)			

Note: ED= Emergency Department, OR= Odds Ratio, CI= Confidence Interval

* p< .05, ***p<.0001

Model 2, 3, and 4: Separate Comparisons by Discharge Outcome

Separate logistic regression analyses were conducted using a model

where each discharge outcome or dependent variable was compared to one other

discharge outcome group for four separate variables: sex, age group, LOS group,

and ED or Acute Group (see Table 6). When comparing the outcomes of cases

discharged Home versus cases with Poor outcomes (Model 3), there were no

significant findings. Conversely, in Model 2, shorter length of stay was

significantly associated with a discharge Home outcome when compared with

discharge to PCH (p<.0001) as Table 6 illustrates. The likelihood of a case with a

short LOS being discharged to a PCH had low association factors, whereas, the

odds of PCH placement were far more likely in the over 90 day LOS (p<.0001). In

this comparison, the odds of returning home were almost 54 times greater in the

zero to 29 day LOS group compared to the PCH group. In Model 4, the

comparison between Poor outcomes and discharged to PCH outcomes, a LOS of

zero to 29 days was more likely to have a poor outcome when compared to a

LOS of 90 days or more (p<.0001) as Table 6 demonstrates.

In sum, the discharge outcomes were not significantly different between

the ED Group and the Acute Group. Therefore, the null hypothesis can be

accepted, that is, there is no difference between groups. However, some

independent variables were noted to have a significant association with the

discharged home dependent variable. The significant factors associated with a

discharged home outcome are: younger age group of (65-84 years) (p <.05), and

shorter length of stay of (0-29 days, 30-59 days, and 60-89 days) (p<.0001).

Table 6: Logistic Regression Model 2, 3, and 4: Factors Associated with Separate Discharge Outcomes

Characteristics	Model 2 PCH (n=138) versus Home (n=433)		Model 3 Poor (n=59) versus Home (n=433)		Model 4 Poor (n=59) versus PCH (n=138)	
	OR	(95%CI)	OR	(95%CI)	OR	(95%CI)
Sex						
Male			(comparison group)			
Female	1.05	(.62- 1.79)	NS		1.87	(.84-4.15)
Age						
65- 84			(comparison group)			
85 + older	.624	(.38-1.02)	NS		1.61	(.72-3.61)
LOS						
0-29 days	53.91***	(22.65-128.31)	NS		.03***	(.01-.09)
30-59 days	20.04***	(10.49-38.3)	NS		.14***	(.05-.37)
60-89 days	3.61***	(2.03 -6.41)	NS		.56	(.19-1.61)
90 days + over			(comparison group)			
Group						
Acute			(comparison group)			
ED	.87	(.5-1.5)	NS		1.67	(.63-4.44)

Note: PCH= Personal Care Home, Poor=medical instability or mortality, OR=Odds Ratio,
CI= Confidence Interval, NS=Not Significant, ED=Emergency Department

*** p<.0001

Chapter 5: Discussion

This study was designed to investigate the outcomes of two separate client groups using data extracted from administrative databases. The results of the study found that there was no significant difference between the outcomes experienced by the ED Group where rapid decision-making and minimal investigation influences case selection for admission to a GRU, compared to the Acute Group where more thorough evaluation and medical stabilization of cases occurs prior to admission to a GRU. Therefore, based on this analysis, the geriatric clinicians in communication with the team Geriatrician appeared to be effective in selecting geriatric rehabilitation clients in a busy emergency environment for a high percentage of cases in 2006. There were no identified studies that examined the outcomes of clients based on admission from ED to geriatric rehabilitation units compared to admission from acute inpatient units to a GRU. The results of this study indicate that for all GRU patients, factors such as length of stay and age group may be determinants of a discharge home outcome, regardless of the admission route.

Group Characteristics

The mean age and the sex distribution of the ED Group and Acute Group were in keeping with statistics on older adults in Manitoba. According to a recent Manitoba Seniors 2006 Census Update completed by the University of Manitoba Centre on Aging (2008), people aged 65 and over represented 14.1% of

Manitoba's total population. The report also found that in the age group of 75 to

84, the sex distribution showed an increased proportion of 143 females for every

100 males, while in the over 85 age group, the proportion of females increased to

219 females for every 100 males. A Canadian prospective controlled trial by

Hogan and Fox (1990) researching the benefits of geriatric consultation teams in

acute care settings found an equivalent mean age in their study of 81 years but

their results found only a 54% distribution of females. The distribution of females

was lower than the present study, which had 64% females in the Acute Group and

70% females in the ED Group.

Moreover, a randomised controlled study with three subsequent research

reports was investigated by Saltvedt, Jordhoy, Mo, Fayers, Kaasa, et al., (2006)

had a similar sex distribution to the current study. The researchers were

comparing outcomes of two client groups and focused on the treatment of frail

elderly clients on a Geriatric Evaluation and Management Unit (GEMU) compared

to the usual care on a Medical Ward (MW). Although, their study recruited

patients over age 75 years, they had a similar mean age of 82 ± 5 in both the

GEMU and MW groups, which is consistent with the present study. Saltvedt, et

al. also found a similar sex distribution in their study as with the present study with

64% females in the GEMU group. Their findings are consistent with Acute Group

sex distribution in the present study.

Admission Criteria for Geriatric Units

Two research studies were found that illustrated direct admission to

geriatric medical units from emergency departments compared to admission to

medical units or the usual care (Harris, Henschke, Popplewell, Radford, Bond, et al. ,1991; Ladefeld, Palmer, Kresivic, Fortinsky, & Kowal, 1995). Both of these studies used selection criteria for their geriatric assessment group of age 70 or older. In contrast to the current study, they included acutely ill clients presenting to the ED and age as their primary admission criteria. Harris et al. (1991) completed a randomized control study of outcomes of these acutely ill elderly patients managed on geriatric medical units compared to general medical units. The randomized trial completed by Landefeld et al. (1995) also included acutely ill elderly clients who were admitted to Acute Care for Elders (ACE) units. Their units had a slightly higher staffing ratio in the physiotherapist, occupational therapist, social worker, and dietitian compared to the usual medical units. The ACE units also included some geriatric environmental attributes such as uncluttered hallways and handrails. The ACE unit and the geriatric medical units described in these two articles were more like an acute care unit than the GRUs of the present study and these researchers found less favourable discharge outcomes than the current study.

The results of the two studies completed by Harris, et al. (1991) and Landefeld et al. (1995) did not find significant differences in the discharge outcomes of mortality or institutionalization between their geriatric units and the usual medical unit groups. In fact Harris, et al. (1991) recommended a more selective admission policy to maximize the benefits of a rehabilitative approach to care. These earlier examples of direct admission to geriatric assessment units emphasized the need for specific selection criteria for clients admitted to geriatric rehabilitation units. Limited selection criteria were utilized by Harris et al. and

Landefeld et al. but it is important to note that they included clients who were medically unstable on admission to their geriatric units in comparison to the present study where medically unstable clients are excluded from admission to a GRU. In the present study, the high proportion of clients who achieved a discharge home outcome, attests to the necessity of consistent admission criteria, which excludes clients who are medically unstable at the time of admission to GRUs.

Reuben, Gold, and Bergman (1997) described a geriatric ED consultation service, which included a Geriatrician, nurse, physiotherapist, and occupational therapist within the ED of a McGill hospital. As with the GPAT clinicians within WRHA EDs, Ruben et al. described an ED consultation service that was geared toward rapid decision-making and acted as "gatekeepers" for admission to their specialized geriatric inpatient wards. In their model, the geriatric nurse clinician reviewed cases during ED staff morning rounds and advised which cases should receive geriatric consultation once physiotherapy and occupational therapy assessments were completed. The geriatric consultation requests were completed by referring physicians (ED or medicine) and the Geriatrician completed the consultation within the ED. No strict admission criterion was utilized, yet, they found the clients most often referred to their service were those with complex multiple medical, social, psychiatric, and placement problems. Their service accepted a high number of clients with dementia, delirium, falls, stroke, fractures, and infections. This program also admitted clients to their geriatric units who were medically unstable with a delirium. In contrast to the GPAT model, the ED admissions were completed by a Geriatrician not a specially trained GPAT

clinician in communication with a Geriatrician as in the GPAT model. Unlike the GPAT model, Reuben et al. (1997) used few selection criteria for admission to their specialized units. They did not examine discharge outcomes in this descriptive article.

A Canadian prospective study evaluated the provision of a rehabilitation consultation service offered within the ED in a Toronto hospital (Lee, Ross, & Tracy, 2001). The goal of this study was to develop a checklist to determine which clients over age 65 required rehabilitation consultation. They utilized several assessment instruments including the Timed Up and Go (Podsiadlo and Richardson, 1991). The researchers examined what factors were predictive of discharge home or hospital admission in relation to age, sex, living alone, functional status, and available supports. They performed logistic regression analysis to examine which variables were predictive of their discharge outcomes. Study results found the mean age of their ED clients was age 75 and 61% were female. As with the present study, Lee et al. found that age and gender were not predictive of a discharge home outcome. However, patient pre-morbid functional status as measured by a disability score and the living situation of the client were most predictive of a discharge home outcome. Although the Toronto study looked at predictors for discharge home from ED, these indicators have relevance to the present study, which investigated the predictors for discharge home from a GRU.

Health Problems at Admission

The lack of clinical definitions within the ICD- 9 database noted in other studies, were also experienced in the present research study utilizing the ICD- 10

database (de Groot, et al., 2003; Needham et al., 2005). The ICD-10 coded

definitions were not clinically relevant for research purposes and as a result were

not used. The Rehabilitation and Geriatrics (R&G) Coordinated Entry health

problems were entered into the database by administrative coordinators, not

trained health information technologists as was the ICD-10 database. Although

the extracted health problems from the R & G Coordinated Entry database could

not be linked with specific cases, these health problems provide further

descriptive characteristics about the health problems experienced by the ED

Group and the Acute Group in the present study.

Intuitively and from clinical experience, one would expect a significantly

higher incidence of medical illness and cardiac problems on admission to hospital

in the Acute Group. Similarly, one might expect a significantly higher prevalence

of falls and weakness on admission in the ED Group. In addition, these results

may illustrate current local practices where medically ill clients are admitted to

acute care units in order to stabilize prior to transferring to a GRU. Since one

selection criterion utilized by GPAT clinicians within the ED stipulates medical

stability prior to a GRU admission, these clients would not be considered for direct

admission to a GRU, but would be admitted to acute care for stabilization.

Therefore, the finding of higher medical illness in the Acute Group would be

expected. Although the medical instability criterion is used in the Acute Group as

well, medically unstable clients who have received treatment for their medical

problems on an acute medical unit would be considered for admission to a GRU.

However, the hospital admission medical illness health problem could remain on

the client file when clients were placed on the R & G Coordinated Entry list for

transfer to a GRU. Clients experiencing cardiac problems are more likely to be

admitted to an acute care unit for further investigation, consultation, and

treatment. Following cardiac stabilization, these clients are often transferred to

GRU to improve function prior to discharge.

The increased reporting of falls and weakness found in the ED group was

also not surprising. Clients experiencing falls or weakness often present to EDs

for early investigation of fractures or cardiac problems. These client cases are

usually not at their functional baseline and frequently require admission. Once

ED diagnostic results of basic tests demonstrate medical stability, these clients

are likely to benefit from the rehabilitation services offered on a GRU and are

therefore, admitted directly from an emergency department.

Hogan and Fox (1990) reported on a Canadian study examining the

benefits of geriatric consultation teams (GCT) on client discharge outcomes in

Nova Scotia. In this study, all clients were admitted to the geriatric inpatient unit

from acute care units. As such, the health problems that these researchers

documented were similar to the Acute Group health problems of this study (see

Figure 2). Hogan and Fox found the most common admitting health problems in

their study were: cardiac problems (40%) and medical illness problems (27%).

Delirium was included in medical illness problems in their study.

Other studies have examined the benefits of a GEMU compared to usual

care with some description of the health problems of their GEMU cases included

(Saltvedt et al., 2006). This study reported similar findings to those of the present

study. The most common admission health problems in their study were: mobility

problems (43%), cardiac problems (36%), infection (24%), and falls (24%).

Similar to the present study, cases could have more than one health problem.

Conversely, the ED research by Lee, et al. (2001) found that 54% of their cases

presented to the ED due to falls. Some of their fall cases were related to alcohol

consumption. However, the presentation of falls in the ED study by Lee et al. was

consistent with the current ED group health problem of 50% falls (see Figure 2).

Group Discharge Outcomes

Studies emphasize that most elderly people prefer to live at home and

avoid institutionalization (Saltvedt, et al., 2006). A positive outcome of discharge

home was accomplished for a high percentage of GRU clients in this research

study. Seventy percent of the ED Group and 68% of the Acute Group were

discharged home. Twenty-three percent of the ED Group and 22% of the Acute

Group required placement in personal care homes (PCH). Finally, 6% of the ED

Group and 10% of the Acute Group had poor outcomes of medical instability or

mortality. There were no significant differences in these outcomes between

groups. These results refute the proposed study hypothesis anticipating a greater

prevalence of poor outcomes (medical instability or mortality) or PCH placement

in the ED Group cases. The results appear to indicate that in 2006, geriatric

clinicians were able to select appropriate clients for admission to GRU from EDs

despite the compressed and limited assessment of these clients in a busy ED

setting.

Rubenstein, et al., (1991) evaluated the effect of Geriatric Evaluation and

Management (GEM) programs on a single outcome of "mortality". Their meta-

analysis pooled data from inpatient consultation services, inpatient GEM units,

home assessment services, and outpatient GEM programs. The researchers

found a 37% reduction in mortality for GEM inpatient units compared to other

medical units. They also reported improved placement as a result of discharge

planning from GEM inpatient units. Twenty-three percent of their GEM unit cases

were able to return home with an additional 39% returning to previous living

arrangements in retirement facilities with support. However, 38% required skilled

nursing care on discharge. Unlike the study by Rubenstein et al., there was no

distinction regarding return to retirement facilities and discharged home in the

present study. Thus, the combined categories of return home and return to

retirement facilities resulted in a total of 62% of cases discharged to community

with or without support. Results reported by Rubenstein et al. were similar to the

discharge outcomes of the current study with 68% of the Acute Group and 70% of

the ED Group discharged home (see Table 2).

Van Craen, Braes, Wellens, Denhaerynck, Flamaing, et al., (2010)

examined the effectiveness of admission to a Geriatric Evaluation and

Management Unit (GEMU). Thirteen reviews based on seven studies were

selected, based on study model quality and selection criteria. The outcome

parameters in the study were: mortality, institutionalization, functional decline,

readmission, and length of stay (LOS). The results indicated significantly

favourable effects of the GEMU group on decreased functional decline and

institutionalization at one year follow-up. Both Rubenstein et al. (1991) and Van

Craen et al. defined GEMU as units that admit frail, older inpatients for a process

of multidisciplinary assessment, review, therapy, and discharge planning. The

geriatric rehabilitation units they described are similar the present study GRUs.

Unlike Rubenstein, et al. (1991), Van Craen et al. (2010) only looked at studies with a combination of comprehensive geriatric assessment (CGA) and multidisciplinary treatment and care in an inpatient setting. All other studies such as inpatient geriatric consultation service assessment, outpatient geriatrics, and home visit models were excluded from the analysis. Van Craen, et al., itemized the beneficial effects of a GEMU on decreasing institutionalization at one year following discharge. They also noted significantly less functional decline observed in the GEMU group at discharge. They reiterated the suggestion of targeting patients who may benefit from admission to GEMU by excluding patients who are too well, too ill, have terminal disease, or severe dementia. Effective selection of GRU clients by GPAT clinicians in communication with the team Geriatricians exclude clients with the same client characteristics as these researchers have stipulated. These exclusion criteria provide guidance in selection of clients who will benefit from rehabilitation. For example if clients are too well, they will not require a minimum of two weeks of rehabilitation in a GRU. Similarly, if they are too ill or medically unstable the staff complement of a GRU is not appropriate for the type of acute care required by the client. Clients with terminal disease may have difficulty participating in the activity level of a rehabilitation program, and clients with severe dementia are not able to understand or benefit from a rehabilitation program.

Saltvedt, et al., (2006) were interested in comparable outcomes to the present research study except they compared GEMU inpatient units with medical wards (usual care). They analyzed outcome dispositions of mortality, probability of living at home versus living in a nursing home, length of stay, functional

decline, well-being and morale. They reported that mortality was significantly lower in the GEMU group (12%) compared to the medical group (27%). In addition, GEMU management improved the likelihood of returning home as 80% of the GEMU group versus only 64% of medical group were living at home at three months post-discharge follow-up. The poor outcomes of both groups in the present study were less than the mortality experienced by the GEMU group in the study by Saltvedt et al., however, the probability of GEMU group cases returning home were slightly higher than the present study.

A randomised control trial conducted by Cohen, Feussner, Weinberger, Carnes, and Hamdy, et al., (2002) compared geriatric evaluation and management unit (GEMU) care with usual inpatient care followed by attendance at an outpatient geriatric clinic or usual outpatient clinic. Several instruments were utilized to evaluate activities of daily living, physical performance, utilization of health services, and health care costs. They concluded that inpatient GEMUs had significant positive effects on health-related quality of life related to physical functioning and general health, pain, and ADL performance at discharge. Outpatient geriatric evaluation and management had positive effects on energy, mental health and general health at one year follow-up of their cases. However, these differences in health related problems were not significant.

The Cohen et al. study was completed with male Veterans and as such, 98% were male, which differs from the present study where there was a predominance of females. They reported a 20% mortality rate from their GEM unit, which is higher than the poor outcomes in the present study of 6% poor outcome in the ED Group and 10% poor outcome Acute Group. The eligibility

criteria for admission to GEMU utilized in Cohen et al.'s study were: age 65 or older, hospitalization on a medical or surgical ward prior to GEM unit admission, inability to perform one or more basic activities of daily living, history of falls, difficulty with mobility, malnutrition, dementia, depression, prolonged bed rest, or incontinence. Although, some of the inclusion criteria utilized in this study were similar to those used by GPAT clinicians, Cohen et al. accepted clients who were medically ill, which is an exclusion criterion in the current study. They also looked at other variables such as length of stay.

Length of Stay

The total hospital length of stay for clients admitted to geriatric rehabilitation units in 2006 in the WRHA showed a large variability because LOS is related to client progress, which leads to skewed distribution as demonstrated by the large standard deviation of the mean length of stay for both groups. The ED Group mean LOS was 66 ± 72 days and the Acute Group was 57 ± 46 days. However, the median LOS was almost the same for both groups; the ED Group median was 42 days and the Acute Group median was 43 days (see Table 1). Median LOS is frequently used locally when discussing length of stay because the median values negate the extreme LOS values.

Length of stay is a value that is not easily compared in the literature. For example, the mean and standard deviation LOS in the Norwegian study by Saltvedt, et al., (2006) was 21 ± 12.2 days but this measurement only included the LOS after they became active in the GEMU, whereas the Veteran study completed by Cohen et al., (2002) found that the GEM unit mean LOS and

standard error (SE) was 35.3 ± 1.4 days but their research was completed in

California and health care cost efficiency was a factor in their study, which might

promote lower LOS. These researchers do not provide specificity regarding

whether the values they reported include total length of stay from admission to

discharge from hospital or only the active rehabilitative portion of client LOS in the

GEM unit. Therefore, LOS is difficult to compare with other studies because of

national and regional health care provision costs influencing LOS, and the

methodology used. Studies may differ in relation to whether the study focused on

total LOS or active rehabilitation LOS, and whether mean and SD or standard

error, or median values were reported.

The present research study demonstrated some statistically significant

findings associated with length of stay (LOS). Logistic regression analyses

indicated that discharge home outcomes were significantly associated with: a

younger age group of 65-84 years (p <.05), and a length of stay of 89 days or less

(p<.0001). The logistic regression analysis indicated that shorter LOSs were

specifically associated with discharge home. It is not uncommon for the

rehabilitation process for elderly clients to take a minimum of one to two months

as indicated in the present study results. As such, the one to two month LOS in

geriatric rehabilitation units are potential indicators for clients returning to their

home.   In contrast, when the LOS was greater than three months, the likelihood

of the client returning home decreased. The findings of this study indicate that a

LOS greater than three months may result in a personal care home placement.

Although shorter LOS has been shown to have significant association with

discharge home status in the present study, this variable may be influenced by

many other factors. If a rehabilitation course progressed smoothly, shorter stays in a GRU are attainable and encouraged. However, there are many iatrogenic illnesses that may be contracted within a hospital setting that may prolong the length of stay. As previously mentioned, staff shortage during specific periods of time may have detrimental influences on increasing LOS. The client's attitude and motivation to participate in the rehabilitation process may also have strong influence on discharge outcomes (Stuck et al., 1993; Wells, et al., 2003). However, there are times when clients' motivation may not be known until after the rehabilitation process has begun. Clients may be accepted to a GRU with knowledge that the prognosis for independent living was poor. The intent in these cases is that rehabilitation will help the client to reach their prior baseline. Finally, discharge planning with the multidisciplinary team toward client-focused goals that include caregivers becomes integral to the success of any rehabilitation process. However, plans may change rapidly without warning when a caregiver experiences illness or dies, and these factors influence a prolonged LOS. As such, the shorter length of stay was a factor associated with a discharged home outcome, but length of stay cannot be controlled in many circumstances.

Although the literature reinforces the fact that a busy ED is a difficult setting to accurately assess elderly clients, the geriatric clinicians in communication with the team Geriatricians in the WRHA appeared to be effective in their assessment of the clients' rehabilitation potential in 2006. The training that geriatric clinicians receive in order to review all health information including test results, collect any missing collateral information, and collaborate with ED team members prior to discussing the client with the Geriatrician are important to the successful selection

of GRU clients. The current study shows that a combination of the unique GPAT

program process and clear selection criteria provide the necessary elements to

select geriatric rehabilitation clients in an ED environment. This is supported by

the fact that no significant differences were found between the discharge

outcomes achieved by the ED Group or the Acute Group. Therefore, geriatric

clinicians in 2006 were able to select clients who would benefit from a GRU based

on the discharge home outcomes that many GRU clients achieved. This research

study is the first to analyze these unique direct ED admissions compared to the

usual indirect acute inpatient admissions to a GRU.

Chapter 6: Conclusions

Significance of the Research

There is a paucity of research regarding programs such as GPAT clinicians assisting with evaluation and management of geriatric clients in both the ED and in the community. This research study provides valuable information about discharge outcomes for older adult cases admitted to GRUs in 2006. It also answers an important research question, indicating that geriatric clinicians were effective in screening and selecting geriatric rehabilitation clients in busy emergency department environments. The study provides support that the selection criteria and rapid decision-making of the geriatric clinicians in consultation with the team Geriatricians were able to identify a large proportion of cases that would benefit from a GRU admission based on the discharge home outcome. Moreover, the results indicate that GPAT clinicians can admit selected clients from EDs without increased risk of poor outcomes for this client group based on the small proportion who experienced poor outcomes of medical instability or mortality. Furthermore, the association between younger clients (age 65 to 84 years) and shorter length of stays have important implications for clients potential to return home following rehabilitation.

Future Research

The growing population of elderly clients often have multiple disease processes and multiple medications to manage their diseases. Their ability to continue living in their home can often be precarious, yet an important factor contributing to their quality of life. Whenever possible, the prevention of decline and improvement of function of geriatric clients should be promoted through community-based resources. At times, however, a rehabilitation inpatient admission may be necessary to prevent a crisis or severe injury and to improve functional ability and quality of life (Rubenstein et al., 1991).

The Winnipeg Regional Health Authority (WRHA) Rehabilitation and Geriatrics program promotes maximizing function and returning rehabilitation clients to their homes upon discharge from inpatient units. Within the Rehabilitation and Geriatrics program, the Geriatric Program Assessment Team (GPAT) model of care has been illustrated as unique, because the program follows elderly clients in and out of the ED. Furthermore, geriatric clinicians working in the ED strive to be effective in facilitating direct admission to inpatient geriatric rehabilitation units. The GPAT use of a screening geriatric assessment, determination of risk, and selection criteria for admission to geriatric rehabilitation units were similar to those identified in the literature. Currently, there is no identified study that examines the unique role of GPAT clinicians in selection from an ED and admitting directly to a GRU. The selection criteria utilized by the GPAT program shows merit for future investigation.

Administrative database studies have limitations and management of such databases requires diligence to improve internal validity of the data. The length of stay results of this particular study reported total length of stay from the initial admission to hospital until discharge of the client from hospital but future research examining specific length of stay in a GRU would be beneficial. Future studies using similar reporting methodology would allow local, regional, and national comparisons for LOS. The limitations of the ICD-10 coding of most responsible reason for admission to a GRU were not clinical diagnoses. In future studies using these databases, the R&G Coordinated Entry client health problems could be linked to specific client cases to provide improved description of client groups, comorbidities, or health problems and the potential influence on discharge outcome. Surprisingly, there were a relatively small number of cases (n=141) out of the total (n=630) admitted directly from the six EDs by geriatric clinicians from the six teams in 2006. Future studies of the unique GPAT program and facilitation of direct admission from an ED to a GRU are warranted. A prospective study following the ED client cohort at 3, 6, 9 months and one year would provide stronger support for the GRU admission criteria and the discharge outcomes obtained by those clients. It would be important to consider differences in discharge outcomes between admissions from the ED to a GRU in 2006 compared to other years as well.

References

Alessi, C.A., Stuck, A.E., Aronow, H.U., Yuhas, K.E., Bula, C.J., Madison, R., et al.,

(1997). The Process of Care in Preventive In-Home Comprehensive Geriatric

Assessment. *Journal of American Geriatrics Society, 45,* 1044-1050.

Basky, G., What works? Linking health outcomes with promising programs and

policies, (2008). *Manitoba Centre for Health Policy, University of Manitoba.*

www.umanitoba.ca/centres/mchp/

Brooks, D., Davis, A., & Naglie, G., (2006). Validity of 3 Physical Performance

Measures in Inpatient Geriatric Rehabilitation. *Archives of Physical*

Medicine and Rehabilitation, 87, 105-109.

Caplan, G.A., Coconis, J., Board, N., Sayers, A., & Woods, J., (2006). Does

home treatment affect delirium? A randomised controlled trial of

rehabilitation of elderly and care at home or usual treatment (The REACH-

OUT trial). *Age and Ageing, 35,* 53-60.

Caplan, G.A., Williams, A.J., Daly, B., & Abraham, K., (2004). A Randomized,

Controlled Trial of Comprehensive Geriatric Assessment and Multidisciplinary

Intervention After Discharge of Elderly from Emergency Department—The

DEED II Study. *Journal of American Geriatrics Society, 52,* 1417-1423.

Centre on Aging, University of Manitoba, (2008, July). Manitoba Seniors 2006 Census

Update. Retrieved on January 20, 2010 from

http://www.umanitoba.ca/centres/aging.

Charlson, M.E., Pompei, P., Ales, K.L., & MacKenzie, C.R., (1987). A new method of classifying prognostic comorbidity in longitudinal studies: development and validation, *Journal of Chronic Diseases, 40,* 373-383.

Cohen, H.J., Feussner, J.R., Weinberger, M., Carnes, M., Hamdy, R., Hsieh, F., et al., (2002). A Controlled Trial of Inpatient and Outpatient Geriatric Evaluation and Management, *New England Journal of Medicine, 346,* 905-912. Retrieved January 18, 2010 from www.pubmedcentral.nih.gov.proxy2.lib. umanitoba.ca database.

Dalby, D.M., Sellors, J.W., Fraser, F.D., Fraser, C., van Ineveld, C., & Howard, M., (2000). Effect of preventive home visits by a nurse on the outcomes of frail elderly people in the community: a randomized controlled trial. *Canadian Medical Association Journal, 162,* 1-8. Retrieved November 3rd, 2007 from cmaj.ca.proxy1. lib.umanitoba.ca.

Dalziel, W.B., Susinski, C., & Dalziel, L.M., (1992). Community-Based Outreach Multidimensional Geriatric Assessment: A clinical and educational model. *Educational Gerontology, 18,* 541-554.

De Groot, V., Beckerman, H., Lankhorst, G., Bouter, L., (2003). *Journal of Clinical Epidemiology, 56,* 221-229. Retrieved August 8, 2009 from www.pubmedcentral.nih.gov.proxy2.lib. umanitoba.ca database.

Élie, M., Rousseau, F., Cole, M., Primeau, F., McCusker, J., & Bellavance, F., (2000). Prevalence and detection of delirium in elderly emergency department patients. *Canadian Medical Association Journal, 17,* 977-981.

Folstein, M.F., Folstein, S.E., & McHugh, P.R., (1975). "Mini-mental state". A

practical method for grading the cognitive state of patients for the clinician.

Journal of Psychiatric Research, 12, 189-198.

Hamilton, B., Granger, C., Sherwin, F., & Keith, R., (1987). The Functional

Independence Measure: A new tool for rehabilitation. *Advanced Clinical

Rehabilitation,1,* 6-18.

Harris, R., Henschke, P., Popplewell, P., Radford, A., Bond, M., Turnbull, R., et al.,

(1991). A randomised study of outcomes in a defined group of acutely ill elderly

patients managed in a geriatric assessment unit or a general medical unit,

Australia, New Zealand Journal of Medicine, 21, 230-234.

Hogan, D. B., & Fox, R. A., (1990). A Prospective Controlled Trial of a Geriatric

Consultation Team in an Acute-care Hospital, *Age and Ageing, 19,* 107-113.

Hwang, U., & Morrison, S., (2007). The Geriatric Emergency Department.

Journal of the American Geriatric Society, 55, 1873-1876.

Inouye, S., van Dyck, C., Allessi, C., Balkin, S., Siegal, A., & Horwitz, R., (1994).

Clarifying confusion: the confusion assessment method. A new method for

detection of delirium. *Annals of Internal Medicine, 113,* 941-8.

Isaacs, B., (1965). *An Introduction to Geriatrics.* London, England: Balliere,

Tindall, & Cassell.

Landefeld, C., Palmer, R., Kresevic, D., Fortinsky, R., & Kowal, J., (1995). A

Randomized Trial of Care in a Hospital Medical Unit Especially Designed to

Improve the Functional Outcomes of Acutely Ill Older Patients, *The New

England Journal of Medicine, 332,* 133801344.

Lee, V., Ross, B., & Tracy, B., (2001). Functional Assessment of Older Adults in

an Emergency Department, *Canadian Journal of Occupational Therapy,*

68(2), 121-129. Retrieved January 18, 2010 from

www.pubmedcentral.nih.gov.proxy2.lib. umanitoba.ca database.

Madden, K., Hogan, D., Maxwell, C., & Ebly, E. The Prevalence of Geriatric

Syndromes and Their Effect on the Care and Outcome of Patients Aged 75

Years of Age and Older Presenting to an Emergency Department.

Geriatrics Today, 5, 69-75.

Mahoney, F. & Barthel, D., (1965). Functional Evaluation: the Barthel Index.

Maryland State Medical Journal, 14, 56-61.

Martens, P. Fransoo, R., Burland, E., Prior, H., Burchill, C., Chateau, D., et al., (March

2008). What works? A First Look at Evaluating Manitoba's Regional Health

Programs and Policies at the Population Level. Winnipeg, Manitoba Centre for

Health Policy, 248-262.

McCusker, J., Bellavance, F., Cardin, S., Belzile, E., & Verdon, J., (2000). Prediction of

Hospital Utilization Among Elderly Patients During the 6 Months After an

Emergency Department Visit. *Annals of Emergency Medicine, 36,* 438-445.

McCusker, J., Bellavance, F., Cardin, S., Trépanier, S., Verdon, J., & Ardman, O.,

(1999). Detection of Older People at Increased Risk of Adverse Health

Outcomes After an Emergency Visit: The ISAR screening tool. *Journal of the*

American Geriatrics Society, 47, 1229-1237.

McCusker, J., Dendukuri, N., Tousignant, P., Verdon, J., Poulin de Courval, L., &

Belzile, E., (2003). Rapid Two-stage Emergency Department Intervention for

Seniors: Impact on Continuity of Care. *Academy of Emergency Medicine, 10,* 233-243.

McCusker, J. & Verdon, J., (2006). Do Geriatric Interventions Reduce Emergency Department Visits? A Systematic Review. *Journal of Gerontology: Medical Sciences, 61A(1),* 53-62.

Meldon, S., Mion, L., Palmer, R., Drew, B., Connor, J., Lewicki, et al., (2003). A Brief Risk-Stratification Tool to Predict Repeat Emergency Department Visits and Hospitalizations in Older Patients Discharged from the Emergency Department. *Academy of Emergency Medicine, 10,* 224-232.

Mion, L., Palmer, R., Anetzberger, G., & Meldon, S., (2001). Establishing a Case-Finding and Referral System for At-Risk Older Individuals in the Emergency Department Setting: The SIGNET Model. *Journal of the American Geriatrics Society, 49,* 1379-1386.

Mion, L., Palmer, R., Meldon, S., Bass, D., Singer, M., Payne, S., et al., (2003), Case Finding and Referral Model for Emergency Department Elders: A Randomized Clinical Trial. *Annals of Emergency Medicine, 41(1),* 57-68.

Mistiaen, P., Duijnhouwer, E., Wijkel, D., M., de Bont, M., & Veeger, A., (1997). The problems of elderly people at home one week after discharge from an acute care setting. *Journal of Advanced Nursing, 25,* 1233-1240.

Molloy, W.D., & Clarnette, R., (1999). *Standardized Mini Mental State Examination: A User's Guide.* Troy, Ontario, Canada: New Grange Press.

Montgomery, P. & Fallis, W., (2003). South Winnipeg Integrated Geriatric Program (SWING): A Rapid Community-Response Program for the Frail Elderly. *Canadian Journal on Aging, 22 (3),* 275-281.

Needham, D., Scales, D., Laupacis, A., & Pronovost, P., (2005). A systematic

   review of the Charlson comorbidity index using Canadian administrative

   databases: a perspective on risk adjustment in critical care research.

   Journal of Critical Care, 20, 12-19. Retrieved August 8, 2009 from

   www.pubmedcentral.nih.gov.proxy2.lib. umanitoba.ca database.

Nicolaides-Bouman, A., van Rossum, E., Kempen, G., & Knipschild, P., (2004).

   Effects of home visits by home nurses to elderly people with health

   problems: design of a randomised clinical trial in the Netherlands. *BioMed.*

   Central Health Services Research, 4, 35, 1-12. Retrieved October 24, 2007

   from www.pubmedcentral.nih.gov.proxy2.lib. umanitoba.ca database.

Pfeiffer, E.A., (1975). A short portable mental status questionnaire for the assessment

   of organic brain deficits in elderly patients. *Journal of American Geriatrics*

   Society, 23, 433-441.

Podsiadlo, D., & Richardson, S., (1991). A test of basic functional mobility for frail

   elderly persons. *Journal of American Geriatric Society, 39,* 142-148.

Principi, E., Lever, J., Vertesi, A., Molloy, D.W., & Tuttle, I.M., (1996). Use of

   Multiskilled Assessors on an Interdisciplinary Geriatric Team. *Physiotherapy*

   Canada, 48, 127-130.

Reuben, D.B., Borok, G.M., Wolde-Tsadik, G., Pardamean, B., Hammond, B., &

   Rubenstein, L.Z., (1992). The Use of Targeting Criteria in Hospitalized

   HMO Patients: Results from the demonstration phase of the Hospitalized

   Older Persons Evaluation (HOPE) Study. *Journal of the American*

   Geriatrics Society, 40, 482-488. Retrieved January 18, 2010 from

   www.pubmedcentral.nih.gov.proxy2.lib. umanitoba.ca database.

Reuben, D., Gold, S., & Bergman, H.(1997). A Geriatric Consultaion Team in the

Emergency Department, *Journal of the American Geriatrics society, 45(6),* 764-

767.

Rubenstein, L., Stuck, A., Siu, A., Wieland, D., (1991). Impacts of Geriatric Evaluation

and Management Programs on Defined Outcomes: Overview of the Evidence.

American Geriatrics Society, 39, 8S-16S.

Saltvedt, I., Jordhoy, M., Mo, E., Fayers, P., Kassa, S., & Sletvold, O., (2006).

Randomised Trial of In-Hospital Geriatric Intervention: Impact on Function and

Morale, *Gerontology, 52,* 223-230.

Scanameo, A., & Fillit, H., (1995). House Calls: A practical guide to seeing the

patient at home. *Geriatrics, 50,* 33-39.

Shah, N.P., Maly, R.C., Frank, J.C., Hirsch, S.H., & Reuben, D.B., (1997). Managing

Geriatric Syndromes: What geriatric assessment teams recommend, what

primary care physicians implement, what patients adhere to. *Journal of the*

American Geriatrics Society, 45, 413-419.

Solomon, D., Brown, A., Brummel-Smith, K., Burgess, L., D'Agostino, R., Goldschmidt,

J., et al., (2003). National Institutes of Health Consensus Development

Conference Statement: Geriatric Assessment Methods for clinical Decision-

Making, *Journal of the American Geriatrics Society, 51,* 1490-1494. (Reprinted

from Journal of the American Geriatrics Society, 1988, 36, 342-347).

Stuck, A.E., Egger, M., Hammer, A., Minder, C.E., Beck, J.C., (2002). Home Visits to

Prevent Nursing Home Admission and Functional Decline in Elderly People.

Journal of the American Medical Association, 287 (8), 1022-1028.

Stuck, A.E., Minder, C.E., Peter-Wuest, I., Gillman, G., Egli, C., Kesselring, A., et al., (2000). A Randomized Trial of In-Home Visits for Disability Prevention in Community-Dwelling Older People at Low and high Risk for Nursing Home Admission. *Archives of Internal Medicine, 160 (7),* 977-986.

Stuck, A. E., Siu, A. L., Wieland, G. D., Adams, J., & Rubenstein, L. Z., (1993). Comprehensive geriatric assessment: a meta-analysis of controlled trials. *Lancet, 342,* 1032-1036.

Toth, M., (1989). Geriatric assessment teams: What they are and who they can help. *Journal of Home Health Care Practice, 2 (1),* 1-8.

Van Craen, K., Braes, T., Wellens, N., Denhaerynck, K., Flamaing, J., Moons, P., et al., (January 2010). The Effectiveness of Inpatient Geriatric Evaluation and Management Units: A Systematic Review and Meta-Analysis*, Journal of the American Geriatrics Society, 58,* 83-92. Retrieved January 18, 2010 from www.pubmedcentral.nih.gov.proxy2.lib. umanitoba.ca database.

Weinberg, L. (2000). *The Effects of Attributional Retraining, Age, and Perceived Control on Health-Related Cognitions: A Longitudinal Field Study of Older Adults Attending Geriatric Day Hospitals.* Unpublished doctoral thesis, University of Manitoba, Winnipeg, Manitoba, Canada.

Wells, J., Seabrook, J., Stolee, P., Borrie, M., & Knoefel, F., (2003). State of the Art in Geriatric Rehabilitation. Part I: Review of Frailty and Comprehensive Geriatric Assessment. *Archives of Physical Medicine and Rehabilitation, 84,* 890-896.

Yesavage, J.A., Brink, T.L., & Rose, T.L., et al., (1983). Development and validation of a geriatric depression screening scale: a preliminary report. *Journal of Psychiatric Research, 17,* 37-49.

Zarit, S., Reever, K., Bach-Peterson, J., (1980). Relatives of the Impaired Elderly:

Correlates of Feelings of Burden. *The Geronologist, 20(6),* 649-655.

Appendix A

University of Manitoba Health Research

Ethics Board Approval Letter

BANNATYNE CAMPUS
Research Ethics Boards

UNIVERSITY
OF MANITOBA

P126-770 Bannatyne Avenue
Winnipeg, Manitoba
Canada R3E 0W3
Tel: (204) 789-3255
Fax: (204) 789-3414

APPROVAL FORM

Principal Investigator: Ms. E. Graceffo

Ethics Reference Number: H2009:215
Date of Approval: July 27, 2009
Date of Expiry: July 27, 2010

Protocol Title: Selection of Geriatric Rehabilitation Clients by Geriatric Clinicians in Emergency Departments

The following is/are approved for use:

- Protocol, Version 1 dated June 18, 2009
- Data Collection Form, Version dated July 17, 2009

The above underwent expedited review and was **approved as submitted** on July 27, 2009 by Dr. John Arnett, Ph.D., C. Psych., Health Research Ethics Board, Bannatyne Campus, University of Manitoba on behalf of the committee per your letter dated July 17, 2009. The Research Ethics Board is organized and operates according to Health Canada/ICH Good Clinical Practices, Tri-Council Policy Statement, and the applicable laws and regulations of Manitoba. The membership of this Research Ethics Board complies with the membership requirements for Research Ethics Boards defined in Division 5 of the *Food and Drug Regulations of Canada*.

This approval is valid for one year only. A study status report must be submitted annually and must accompany your request for re-approval. Any significant changes of the protocol and informed consent form should be reported to the Chair for consideration in advance of implementation of such changes. The REB must be notified regarding discontinuation or study closure.

This approval is for the ethics of human use only. For the logistics of performing the study, approval must be sought form the relevant institution, if required.

Sincerely yours,

John Arnett, Ph.D., C. Psych.
Chair, Health Research Ethics Board
Bannatyne Campus

Please quote the above Ethics Reference Number on all correspondence.
Inquiries should be directed to REB Secretary
Telephone: (204) 789-3255 / Fax: (204) 789-3414

www.umanitoba.ca/faculties/medicine/research/ethics

Appendix B:

Winnipeg Regional Health Authority

Research Committee Approval Letter

Agreement for Access to Personal Health Information for

Research Purposes

Winnipeg Regional   Office régional de la
Health Authority   santé de Winnipeg
Caring for Health   À l'écoute de notre santé

200 – 1155 Concordia Avenue
Winnipeg, Manitoba
R2K 2M9 CANADA

June 22, 2009

Ms. E. Marlene Graceffo
Rm. A241 – Deer Lodge Centre
2109 Portage Avenue
Winnipeg, MB R3J 3L0

Dear Ms. Graceffo,

Re: "Selection of Geriatric Rehabilitation Clients by Geriatric Clinicians in Emergency Departments" -
WRHA Reference No: 2009-007

We are pleased to inform you that your research access request for the above-named study has been approved by the Winnipeg Regional Health Authority (WRHA) Research Review Committee pending confirmation that the following conditions are met or agreed to:

- You, your co-investigators, and your research assistants comply with the relevant privacy legislation as indicated below.

  [X] The Personal Health Information Act — *completed June 24th, 2009. see attached*

  [ ] The Freedom of Information and Protection of Privacy Act

  [ ] The Personal Health Information Act and The Freedom of Information and Protection of Privacy Act

- You complete and return the attached Confidentiality Agreement(s) to Judy Li, Concordia Hip & Knee *send HREB* Institute, WRHA, 200 – 1155 Concordia Avenue, Winnipeg, MB R2K 2M9;

- You submit to our attention any significant changes in your proposal prior to implementation or any significant changes during the course of the study;

- You submit a summary of the final results of the study to the WRHA and provide us with a copy of any publications arising from the study;

- It is an expected courtesy that WRHA will be given a minimum of five working days advance notice of publication or presentation of results with policy implications, in order to be prepared for public response;

- You agree to be accountable for appropriate storage and elimination of material.

Thank you for selecting the Winnipeg Regional Health Authority as the site to conduct your research. Please let us know should you encounter any site-related difficulties during the course of your study.

We extend best wishes for successful completion of your study.

Sincerely,

Dr. Michael Moffatt, M.D., MSc., FRCPC
Executive Director, Division of Research and Applied Learning
Chair, Research Review Committee
Winnipeg Regional Health Authority

cc. Dr. Brian Postl, WRHA
     Ms. Landis Esposito, WRHA
     Dr. John Arnett, Chair, HREB

Encl: *PHIA Agreement*

The Personal Health Information Act of Manitoba

AGREEMENT
FOR
ACCESS TO PERSONAL HEALTH INFORMATION
FOR
RESEARCH PURPOSES
BETWEEN:
WINNIPEG REGIONAL HEALTH AUTHORITY
(hereinafter referred to as the "WRHA")

- and -

_____
(hereinafter referred to as the "Principal Investigator")

This agreement is used once a proposal to access personal health information for research purposes has been approved by the WRHA. Once the person conducting a health research project ("Principal Investigator") has signed this form and the terms and conditions of access have been approved by the WRHA, it becomes a legal agreement between the Principal Investigator and the WRHA. The [name of site specific application form] application must be appended to this agreement and forms part of the legal agreement.

The collection of the information referenced on this form, is authorized by *The Personal Health Information Act* and will be used only to administer the research project. Landis Esposito, Chief Privacy Officer, 4th Floor – 650 Main Street, Winnipeg, Manitoba R3B 1E2, 926-7049, can answer any questions concerning this agreement or the collection of the information on this form.

Identification of Principal Investigator

Eleanor Marlene Graceffo
Name (last name/first name/initials)

Address: *Rm A241 Deer Lodge*   Telephone: *831-2537*
2109 Portage Ave   Fax: *831-2149*
Winnipeg, Man   E-mail: *mgraceffo@deerlodge.mb.ca*
R3J 0L3

Title of Research Proposal:
Selection of Geriatric Rehabilitation Clients by Geriatric Clinicians in Emergency Departments

WRHA Reference Number of Research Proposal: *2009-007*

Please provide the following additional information if applicable:

Institutional Affiliation and/or Department: *WRHA Rehab + Geriatrics Program*

Position: *WRHA Rehab+Geriatrics Regional Manager + M.Sc (Rehab)*   Academic Advisor (if student): *Dr. Leah Weinberg*

Revised August 9, 2005   Page 1 of 2

1. The researcher has requested access to the following records that contain personal health information and are in the custody or under the control of the WRHA. (Describe the records below) *No actual records but:*

   Geriatric Program Assessment Team Intake Database Info
   Rehab+ Geriatrics Coordinated Entry Database
   WRHA ICD10 DATABASE

   (the "records")

2. The Principal Investigator agrees to the following terms and conditions:

   a) not to publish the personal health information requested in a form that could reasonably be expected to identify the individuals concerned.

   b) to use the personal health information requested solely for the purposes of the above-named approved research project;

   c) to destroy the personal health information or remove all identifying information at the earliest opportunity consistent with the purpose of the project.

      - Specify when identifying information will be destroyed: *Once data is coded for data analysis. Only 1 copy of codes linked to identity will be maintained until published aggregated (approx 3yrs)*
      - Specify procedures to destroy identifying information: *According to WRHA + U of Mb all information will be confidential shredded before destruction.*

   d) to use reasonable safeguards to protect the confidentiality and security of the personal health information:

      - Specify safeguards: *Investigators office is locked + file cabinet ε information is locked. PC is password protected and information is password protected for security.*

   OR

      - Attach the REB submission form and specify area where this is stated.

      See attached HREB application

3. The WRHA agrees to grant access to the records on the terms and conditions set out in paragraph 2.

Research Department approval is depended upon the Principal Investigator providing a copy of the REB final approval letter to the Research Department.

Signed at: *650 Main St.* this *24th* day of *June* , 20 *09*

_____   _____
Signature of Principal Investigator   Signature of WRHA Representative

- *SIGNED COPY TO BE RETAINED IN RESEARCH DEPARTMENT*

Appendix C

Winnipeg Regional Health Authority

Health Information Request Form

Winnipeg Regional Office régional de la
Health Authority santé de Winnipeg

**WRHA HEALTH
INFORMATION REQUEST FORM**
Fax: 204.947.9970 Attention: A. Hakansson

Date of Request: *June 7/07* Date the information is required (ASAP not sufficient): *Sept 1/07*

Client Information

Name of Organization: *Geriatric Program Assessment Team (Rehab & Geriatrics)*

Individual Requesting Information: *M. Gracetto* Title: *Rehab & Geriatrics Regional Manager*

Address: *Rm A241, Deer Lodge Centre, 2109 Portage*

Telephone: *831-2537* E-mail: *mgracetto@deerlodge.mb.ca or groupwise WRHA*

Analysis Definition

State the question for analysis you are asking: *PHASE 1 Outcome analysis of Geri Rehab clients placed on Central wait List + transferred to Geri Rehab bed.*
PHASE 2 - GPAT ER AUDIT What is the purpose of the analysis? *Program evaluation of pt. care in ER when GPAT is involved.*

Specify Date Range: *'06 calendar year.*

List Geographic Location(s) of Interest: *All hospitals in WRHA*

List Age Breakdown(s) of Interest: *N/A   65 yrs or older.*

Specify Gender if required: Yes ☐   No ☑   Describe: _____
List Other Information Stratifications required: *Phase 1 - Outcome Info including*
LOS in Geri Rehab bed. List by PHIN, NAME, DoB. Phase 2 - to follow.

Please draft a simple table that summarizes the data you expect to receive. Completeness and clarity will assist the in assessing this request quickly.

Policy Required Information

Indicate that you have signed the WRHA Oath of Confidentiality (Check ONE): Yes ☑   No ☐

Indicate if this request in intended for Research (Check ONE): Yes ☐   No ☑

If Yes, Please attach a copy of approval letter from WRHA Research Review Committee and ethics approval letter, if appropriate.

Authorization:
WRHA: (4.1)   CEO/Vice-President Signature: _____

(4.2) Priority: 1   2   ③   4   5

Media: (4.3.3)   WHRA CEO Signature: _____

Other: (4.3.1)   Organization CEO or Executive Director: _____

April 2006