AN EVALUATION OF THE TRANSITION BED UNIT IN ST. JOHN'S, NEWFOUNDLAND AND LABRADOR

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AN EVALUATION OF THE TRANSITION BED UNIT IN ST. JOHN'S, NEWFOUNDLAND AND LABRADOR

by

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Abstract

A retrospective, observational pre-post design was used to assess the effectiveness of a thirty-bed transition unit on the hospital length of stay of alternate level of care seniors in the Health Care Corporation of St. John's, St. John's, Newfoundland and Labrador; and the transition-bed program to provide appropriate, temporary residential accommodation for patients waiting for long-term care placement in the St. John's region. Three, six month study intervals were considered within a three-year period between January 1999 and June 2002.

The hospital study sample was comprised of 346 alternate level of care seniors. There were significant differences in the mean length of stay across the three study periods: Period 1, 69 days (SD 49.9); Period 2, 54 days (SD 25.6); and Period 3, 69 days (SD 45.4). Similar to the literature, most seniors exited alive (90%) however, inconsistent with the literature; a high percentage were discharged to chronic care facilities (57%) versus returning home. Also across study periods, there was a significant increase in the number of patients discharged to acute care facilities: Period 1, (8.4%); Period 2, (11.7%); and Period 3, (20.4%). This study's finding indicate that the transition-bed program, as a single approach to the issue of alternate level of care seniors, was not successful at sustaining a reduced length of stay for acute care beds in the St. John's region.

The transition-bed study sample (N=110) was comprised of patients located at two transition-bed sites and there was good compliance with most admission criteria at both sides. Contrary to previous researchers, this study's findings indicate that cognitive

impairment was not a barrier to efficient placement of seniors; most transition-bed patients were cognitively well (69.9%) and the mean length of stay for cognitively impaired patients at both sites, was less than the mean length of stay for the patients as a whole. Most patients exited the transition-beds within the anticipated time frame of 90 days and received their preferred long-term care option.

The literature identifies a variety of issues that impact the hospital length of stay of seniors including individual characteristics, health system factors (including a lack of alternative services), a lack of coordination between system components, and policy decisions that do not support the necessary changes. These multi-dimensional factors would suggest that a health systems approach is required to address the complex issues of long hospital stays by elderly patients. In the absence of further health system information, including an examination of policies, practices, and comparative cost analyses of available programs and services for this population; findings from this study are inconclusive to recommend the generalizability of the current St. John's regional transition-bed program as a viable method to address the issue of hospital length of stay of seniors.

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Chapter 1.0 Introduction

1.1 Preamble

In Newfoundland and Labrador, the publicly funded health care system is mandated to provide quality, client-focused services. However, this is becoming more challenging due to increasing expenditures and demands for services that are growing more rapidly than the provincial budget (Government of Newfoundland and Labrador, 2001). In particular, some analysts suggest that without major reorganization, the future accessibility to health care may be detrimentally affected by a declining revenue base resulting from a decrease in total population and a simultaneous increase in the proportion of the population over 65 years of age (McDonald and Parfrey, 2001). While acknowledging a lack of consensus regarding the impact of an aging population on the health care system, policy makers are compelled to strategically plan for an anticipated increase in utilization and service requirements of this population (Government of Newfoundland and Labrador, 2001).

In this regard, identifying the barriers to system efficiencies for seniors 65 years and older, and addressing the issues through cost-effective programs and services is currently a focus of policy research in Canada. This has typically involved the formulation of early discharge policies, reducing emergency room backlogs, and implementing admission wait lists (Canadian Policy Research Networks Inc., 2001). In acute care facilities, one efficiency indicator is the appropriate utilization of beds (Shapiro, Roos, & Kavanagh, 1980; Shapiro, Tate, & Tabisz, 1992). Hospitals regularly monitor bed utilization practices to ensure that the patients who occupy acute care beds

actually require that level of service. Current bed utilization statistics suggest that the province of Newfoundland and Labrador has longer lengths of stay in hospitals and higher levels of inappropriate bed utilization than the national average (Government of Newfoundland and Labrador, 2001).

The issue of inappropriate utilization of acute care hospital beds by seniors has been recognized for several decades, and its impact is multi-dimensional (Rosenfeld, Goldman, & Kaprio, 1957; Rubin, & Davies, 1975). First, "blocked beds" increase health care costs by diminishing the capacity of hospitals to appropriately utilize acute care services, including professional staff resources (Rubin & Davies, 1975, Shapiro et al., 1992). For example, in a system designed to cure and ensure timely discharge, some acute-care health professionals do not find their work with non-acute ill elderly patients to be rewarding (Brymer, Kohm, Naglie, Shekter-Wolfson, Zorzitto, O'Rourke, & Kirkland, 1995). Second, long stays in hospital may place seniors at increased risk of developing nosocomial illnesses including skin breakdown, malnutrition, and urinary incontinence (Shapiro et al., 1992). Finally, prolonged hospitalization by elderly patients may contribute to psychological distress, increased dependence on staff, or disengagement (Brymer et al., 1995; Shaughnessy, Schlenker, & Kramer, 1990) and affect the individual's ability to readjust to life outside the institutional setting (Rosenfeld et al., 1957).

Long stays by seniors in acute care facilities have been the focus of study from many perspectives. Several studies have identified the barriers to efficient hospital discharge, and described various, broadly defined interventions to address them (Shapiro

et al., 1980, McClaren, Tover-Berglas, & Glass, 1991). However, there are a limited number of published evaluations of well-defined interventions to address the inappropriate acute bed utilization by elderly patients (Shapiro et al., 1992).

1.2 Purpose

This thesis evaluates an intervention introduced in August 1999 by the Government of Newfoundland and Labrador, Department of Health and Community Services in cooperation with its agents; Health Care Corporation of St. John's, Health and Community Services St. John's Region, and the St. John's Nursing Home Board, to address the issue of alternate level of care seniors occupying acute care beds in the St. John's Region.

Thirty beds within the acute and long-term care sectors of the St. John's region were reallocated as transition beds. The transition-bed program was designed to provide temporary residential care to non-acute/alternate level of care, hospitalized seniors who were awaiting nursing home placement. The intended outcome of the transition-bed program was a reduction in the hospital length of stay of alternate level of care seniors by providing appropriate, transitional residential care.

There are two main components of this thesis examining the effectiveness of the transition-bed program: 1) an outcome evaluation of the impact of the transition-bed program on the hospital length of stay by alternate level of care seniors, and 2) a process evaluation of the transition-bed program to provide appropriate, temporary alternate level of care for hospitalized seniors.

Three study periods were selected for the hospital-bed evaluation:

Baseline: January 1, 1999 to June 30, 1999, a six month interval prior to the introduction of the transition bed program; Post-intervention 1: January 1, 2000 to June 30, 2000, a six month interval within one calendar year after the establishment of the transition beds; and Post-intervention 2: January 1, 2002 to June 30, 2002, a six month interval within two calendar years of the establishment of the transition beds.

Two study periods were selected for the transition-bed evaluation:

Baseline: January 1 to June 30, 2000, a six month interval within one calendar year of the introduction of the transition-bed program; and Post-intervention 1: January 1 to June 30 2002, a six month interval within two calendar years of the establishment of the transition beds.

The objectives of the hospital outcome evaluation component were:

- To describe the demographic (age, sex and residence) and clinical characteristics (most responsible diagnosis) of alternate level of care seniors who occupied the acute care hospital beds in each of the three study periods.
- To analyze the utilization of the acute care beds by alternate level of care seniors in each of the three study periods, specifically: the length of stay; the number of alternate level of care days; the status at hospital separation, the type of institution at discharge; and the number of alternate level of care days by destination at hospital separation.

The objectives of the process evaluation of the transition-bed component of the study were:

- To describe the demographic (age, sex, and residence) and clinical characteristics (level of care, level of cognition, medically stable, and whether they were declared as alternate level of care) of the transition-bed patients in each study period and at each transition-bed site.
- To assess the appropriateness of admission into the transition-beds, for example the patients' match with the admission criteria in each study period and at each transition-bed site.
- To analyze the utilization of the transition-beds in each study period and at each transition-bed site, specifically: the length of stay (total and by level of cognition); and the status at separation from the transition-beds, for example, if the patient died or transferred to a long- term care placement of choice.

1.3 Rationale

In 1999, the transition-bed program that was introduced in the St. John's region to address the problem of alternate level of care seniors occupying acute care hospital beds while awaiting placement into long-term care facilities. Regional health system administrators had identified this situation to be both an inefficient use of acute care resources and an inappropriate level of care for these seniors. The transition-bed program was designed to improve the efficiency of acute care resources while providing appropriate, transitional residential care for alternate level of care seniors.

This intervention had not been formally evaluated since its inception in August 1999. Such an evaluation provides local data on important health issues affecting individual patients and their families, their care providers and the health care system in the St. John's region. Evaluation findings could be used to inform regional and provincial decision makers regarding appropriate utilization of health care resources. Additionally, the results from such a local study may be generalizable to address the issue of prolonged hospital length of stay by alternate level of care seniors in other regions.

1.4 Background: Health Care Service Delivery in the St. John's Region

In Newfoundland and Labrador, publicly funded health care and community services are mandated by the Government of Newfoundland and Labrador and administered through fourteen independent health boards representing six geographically diverse regions. This thesis focused on the services and accountability structures located in the St. John's region.

The St. John's region is the largest and the most densely populated region in the province, with a catchment population of approximately 186,000 (Government of Newfoundland and Labrador, 2001). The regional boundaries extend from Seal Cove, located in Conception Bay South, to St. Shotts, located on the Southern Shore. It encompasses the urban municipalities of St. John's and Mount Pearl and the Town of Bell Island.

Health services in the St. John's region are managed by four independent boards: Health Care Corporation of St. John's, Health and Community Services St. John's

Region, St. John's Nursing Home Board, and Newfoundland and Labrador Cancer Treatment and Research Foundation.

The Health Care Corporation of St. John's provides hospital-based acute, secondary and tertiary-level care, extended-care and rehabilitative services plus many provincial programs. There are 828 acute care beds that represent approximately 48.8% of the total number of acute care beds in the province (Government of Newfoundland and Labrador, 2001).

Health and Community Services St. John's Region provides a wide range of community-based health and social services including mental health and addictions, youth corrections, health promotion and disease prevention, home supports and community-based residential services. Community-based long- term care residential services for seniors are available through a network of twenty-three privately owned, licensed personal care homes. Health and Community Services St. John's Region approves all personal care homes and monitors the care standards in each of the facilities. It is also mandated to coordinate access to long-term care (institutional and community-based), through a single entry system that was established in 1994 in partnership with the institutions now represented by the St. John's Nursing Home Board.

The St. John's Nursing Home Board is a partnership of six non-profit organizations that operate high-level institutional-based, long-term care residential services. The Board was established in 1996 by the Government of Newfoundland and Labrador, and represents the partnership of six nursing homes in St. John's regarding a range of operational agreements including Memoranda of Understanding, a Governance

Agreement and direct operational authority (Applied Management Consultants, 2001). There are a total of 1051 beds that provide residential care services including nursing, social work, rehabilitation and recreational services, respite care and palliative care.

Finally, the Newfoundland and Labrador Cancer Treatment and Research Foundation delivers provincial and regional cancer care programs and services. The Provincial Cancer Centre is located in St. John's and there are four regional cancer care centres and three regional cancer clinics throughout the province.

This thesis focuses on the assessment and placement services for long-term care provided by three of the four Boards: Health Care Corporation of St. John's, Health and Community Services St. John's Region, and St. John's Nursing Home Board. It did not consider other types of residential arrangements chosen by some seniors such as unlicensed boarding homes, assisted living facilities or private care facilities.

1.4.1 Long term Care Residential Services

There are a total of 1051 institutional long-term care beds in the six facilities operated by the St. John's Nursing Board. Approximately 16% of these beds provide low level care requirements for Levels 1 and 2 category clients, the remainder provide high level care to Levels 3 and 4 clients. Level 1 clients are able to maintain independence with some assistance with activities of daily living such as dressing, bathing, toileting and mobility. Level 2 clients require a moderate amount of assistance with basic daily activities in order to live comfortably and safely in their home environments. Generally, with the support of family or paid caregivers, Level 1 and 2 clients are able to continue to

live in the community in their own homes or in supervised residential arrangements such as personal care homes. Level 3 and 4 clients, however, require the daily professional care and level of supervision provided by the institutional long-term care sector to meet the vast majority of daily activities.

There are also 471 community-based supervised care beds providing Levels 1 and 2 care through a system of twenty-three private, for profit facilities. Personal care homes are licensed and monitored by Health and Community Services St. John's Region under the Personal Care Home Act, 1998. The majority of the beds (n=372) in these facilities are subsidized by the provincial Department of Health and Community Services. Most of the twenty-three licensed personal care homes in the St. John's region are located in rural areas. For example, as of writing, there is no licensed personal care home in the city of St. John's and only two such facilities exist in the other urban center of Mount Pearl.

1.4.2 Access to Long Term Care: A Single Entry Model

Under the present assessment and placement system, seniors who request long term care services are assessed by hospital or community health professionals using a provincially standardized needs assessment tool, the Continuing Care Assessment for Adult Long Term Care. This assessment instrument collects information on demographics, activities of daily living, selected clinical information, level of available informal supports, and degree of disability of the individual. This information is used to determine the client's level of cognition and care requirements according to the classification system developed by the Department of Health in 1991.

The Levels of Care Classification Instrument is also utilized to assess mobility and perceptual and medical indicators to determine the requirements for care and supervision. Clients are classified as Level 1, 2, 3 or 4. As previously described, Level 1 and 2 clients require the least amount of care and supervision, while Level 3 and 4 clients are increasingly more dependent.

In 1994, a Memorandum of Understanding was signed between the St. John's Nursing Home Board and Health and Community Services St. John's Region to establish a single entry placement system to maintain a wait list and coordinate placements into the long-term care sectors operated by both Boards. Seniors are placed on the single entry wait list following a review of their Continuing Care Adult Long Term Care Assessment by a panel of administrative staff from each Board. The panel meets bi-monthly to review new applicants and requests for transfers between facilities or between regions of the province.

The panel reviews the information presented and assigns the classification of level of care and the priority of the individual for placement into a long-term care facility. Priority status is given to seniors with the greatest need, for example, someone at risk to himself/herself or others. Coordinators refer to a rotational schedule to ensure fair and reasonable access to long-term care services for all sources for clients: community, medically discharged patients in hospitals and transfers within and outside the region. The rotational schedule is only interrupted to accommodate priority situations such as community emergencies or other temporary situations that require priority consideration such as an unusually high number of blocked hospital beds.

A placement coordinator informs the senior or family member of the panel's decisions and updates the demographic and clinical data of the new applicants including: age, sex, the classification of level of care, the preferred choice of facility(s) and priority standing. The sex of applicants is especially relevant since most of the accommodations in the long-term care sector are double occupancy rooms and roommates must be of the same sex.

The Nursing Home Board initiates the process to fill vacant long-term care beds in its facilities. Personnel from the Nursing Home Board notifies a placement coordinator at Health and Community Services regarding which facility has a vacancy and the classification level and gender of the client that can be accommodated. The placement coordinator matches these criteria to the next eligible client from the wait list including those with priority status.

1.5 The Intervention: The St. John's Regional Transition-Bed Program

During the summer of 1999, several factors converged, forming the catalyst for the introduction of a new transition bed program in the St. John's region. First, fewer registered nurses were available to staff acute care facilities as a result of a labor dispute in April 1999. The settlement of this dispute involved the conversion of large numbers of casual nursing positions to permanent status. This was a lengthy process for employers that resulted in a reduced number of nurses available for regular shifts and for vacation relief schedules. In response, hospitals implemented a variety of strategies to optimize the utilization of acute care beds. For example, to facilitate early discharge, the

Department of Health and Community Services approved additional home supports for eligible patients to return home. It also established transition beds to move elderly, alternate level of care patients out of acute care beds.

A total of 30 beds (15 in the Hoyles-Escasoni Complex and 15 in the Leonard A. Miller Centre) were identified by the St. John's Nursing Home Board and the Health Care Corporation of St. John's, and reallocated as transitional residential accommodation for alternate level of care seniors occupying acute care beds while awaiting long term care placement. Each site was renovated to provide "a more tranquil and home-like environment". Interdisciplinary teams of professional staff were available to provide the "care, social support and rehabilitative programming needed by clients who are unable to manage in their family home" (Health Care Corporation of St. John's, 1999, p1).

Eligibility criteria for admission into the transition beds were established by administrative staff of: Health Care Corporation of St. John's, Health and Community Services St. John's Region and the St. John's Nursing Home Board in consultation with the Department of Health and Community Services. Information about the transition-bed program and process for admission were communicated to patients, families and stakeholder organizations. Access to the transition beds is managed by Health and Community Services St. John's Region and these clients are maintained by the single entry system to access their long-term care placement of choice. Transition-bed patients are billed for the medical discharge accommodation rate, in accordance with the guidelines of the provincial Department of Health and Community Services.

The focus of this thesis was to examine the effectiveness of the transition-bed program from two perspectives; the impact of the program on the hospital length of stay by alternate level of care seniors in the Health Care Corporation of St. John's; and the appropriateness of the allocated regional transition-bed resources to provide temporary alternate level of care for hospitalized seniors.

Chapter 2.0 Literature Review

2.1 Historical Background

As early as the nineteenth century, hospitals recorded the problem of chronic status elderly patients in acute care beds (Gillick, 1989). With the introduction of non-profit general hospitals during the nineteenth century, hospitals were often "saddled with old chronics", elderly persons who could not be discharged to home following their acute illnesses. Statistics from the Massachusetts General Hospital in 1855 revealed that these patients accounted for an average length of stay of 81 days (Gillick, 1989). Nearly half a century later, British, Canadian and American researchers continue to profile the issues of the "long stay" patients and report on interventions to achieve better patient care and the optimal utilization of general hospital beds (Rosenfeld et al., 1957).

2.2 Defining the Problem

Researchers use various ways to describe the interval between the completion of acute care treatment and hospital discharge including; "non-medical hospital days" (Glass, Mulvihill, Smith, Peto, Bucheister, & Stoll, 1977), "administratively necessary days" (Markson, Knight Steel, & Kane, 1983), and "alternate level of care days" (Brymer et al., 1995). Also, a variety of terms/phrases have been used to describe the individuals in these beds including: "bed blockers" (Ruben and Davies, 1975), "placement problems" (Brymner et al., 1995), "holdover patients" and "Medicaid rejects" (Glass et al., 1977), and "chronic status patients" (McClaren et al., 1991). The Health Care Corporation of St.

John's refers to these individuals as alternate level of care patients (ALC). For the purpose of this study, "alternate level of care" will be used to describe these patients.

Most elderly patients do not pose placement problems and only a small number of elderly patients are responsible for bed blockages. In St. John's, the majority of seniors who are discharged from hospital return directly to their previous living arrangements with or without some additional supports (Pamela Elliott, Vice President Planning and Quality, Health Care Corporation St. John's: personal communication, May 2002). This is consistent with the findings of DeCoster and Kozyrskyj (2000); that 52% of long stay adult patients (18 years and over) returned home compared to 13% who transferred to nursing homes or other personal care homes. It is also consistent with Menec, MacWilliam, Soodeen, & Mitchell (2002) who concluded that most seniors, particularly those 65 to 74 years of age, are healthy and require few health care resources. Similarly, Harris, Finucane, Healey, & Bakarich (1997) studied the use of acute care inpatient services by people 90 to 99 years of age at a major teaching hospital in Adelaide, Australia. The study retrospectively examined the hospital separations of 214 patients who accessed acute care services and found that while these patients had a longer mean length of stay compared to all patients (6.9 days compared to 3.7 days), 90% of these elderly patients survived their hospitalization and returned directly to their previous living circumstances.

While the problem of elderly patients blocking acute care beds is widely acknowledged, there is no universal operational definition of the long stay patient (Markson et al., 1983; Shapiro et al., 1992). Historically, there was widespread

acceptance of the American Hospital Association's use of a 30-day period to demarcate short from long-term hospital status (Rosenfeld et al., 1957). Until the early 1990s, only Quebec required physicians to declare when patients had achieved an alternate level of care status (McClaren et al., 1991). Elsewhere in Canada, there was no precise system to determine an alternate level of care for the patient who no longer required acute care (Brymer et al., 1995).

2.3 Characteristics of Long Stay Elderly Patients

Researchers have investigated patients' socio-demographic characteristics, clinical characteristics, placement preferences, and family situations and their association with long hospitalization once patients are declared alternate level of care.

An early American study, Rosenfeld et al. (1957), determined that neither patients' characteristics, their classification for service requirements, nor potential for rehabilitation had as much impact on hospital lengths of stay as such variables as the reluctance of the family to accept the patient, the unsuitability of the patient's home, or the lack of other facilities and services (e.g. day programs, home supports).

Markson et al. (1983) used US data regarding hospital characteristics and discharge planning practices to determine their effect on the length of stay of seniors (60 years and over) in 50 acute care hospitals in the Boston Health District. From the perceptions of the discharge planners, the main reasons for placing elderly patients in nursing homes included: mental disorientation and/or confusion; inability to perform activities of daily living and inability of the family to provide care. Additionally, the

planners perceived that these same patients are the most difficult to place in nursing homes, and placement problems were compounded when patients had inadequate financial resources or insurance for long-term care. These researchers suggest that planners are not indifferent to patient and family preferences for placement; however, tension exists between the need to place patients in the first available bed or one that they can afford, and the personal preferences of the patient and family.

DeCoster and Kozyrskyj (2000) identified specific patient characteristics and health system factors that influence the hospital length of stay for seniors. This population-based Canadian study of seven acute care facilities in Winnipeg, examined long stay (greater than 30 days) adult patients (over the age of 18 years, excluding psychiatric and obstetric patients) to determine what accounted for the largest portion of their stay. These researchers considered a variety of socio-demographic (age, gender, type and place of residence), clinical (selected most responsible diagnoses, levels of care and cognition and treatment factors) and health system factors. They found that most adult long stay hospitalizations are attributable to a few diagnoses such as stroke, heart disease and musculoskeletal diseases. Stroke patients had a 17% longer length of stay than other diagnoses and stroke patients hospitalized on a geriatric unit had a 31% longer length of stay. Also, cognitively impaired patients had a 16% longer length of stay compared with patients who were cognitively well. Place of residence, for example being a resident of Winnipeg versus residing outside the city, had no influence on hospital length of stay. The shortest lengths of stay were associated with surgical patients and medical patients discharged to home. However, the single largest determinant of length of

stay was the patient's destination at hospital separation.

There is limited published data regarding clinical characteristics of hospitalized seniors for Newfoundland and Labrador. During 1999/2000, the top three reasons for hospitalizations of seniors, 65 years and over, were; hip replacement (73.1%); cancer (62.8%); and circulatory disorders (62.1%), (Government of Newfoundland and Labrador, 2001). Hospital data collected from 1994 to 1999, identified women aged 75 years and over as almost three times more likely to be admitted to hospital with a fractured hip than men of the same age (Newfoundland and Labrador Center for Health Information, 2003). The causes identified for falls in older persons include: natural deterioration of vision, hearing, reflexes, muscle and bone mass, as well as chronic diseases and prescription drug use.

Shapiro et al. (1992) found that patients' medical characteristics had minimal impact on hospital length of stay. Specifically, neither cognitive impairment nor behavioral changes were significantly associated with the length of stay. The factor that had the greatest impact on length of stay was the patient's choice of nursing home; patients awaiting a non-profit ethno-religious home waited almost a year for transfer compared to patients who chose for-profit and non-profit secular homes (115 days and 195 days respectively).

New Zealand researchers Hilder, Kirk, Bidwell, Weir, Cook & Tolan (1998) conducted a review of the literature regarding acute medical hospital admissions and the determinants of long-stay patients. In addition to identifying that experienced emergency room physicians were less likely to admit inappropriate patients than less experienced

physicians (a health system factor); these researchers determined that the most important predictors of extended hospital stay were age, living alone and impaired mental state.

DeCoster and Kozyrskyj (2000) also compared patients with various post-hospital destinations. The average length of stay of patients awaiting permanent placement in a long-term care facility was 170 days compared to patients who died in hospital (82 days), patients transferred to another hospital (81 days) and patients discharged home (58 days). Patients discharged to nursing homes stayed two to three times longer than those going home. As much as 85% of all patient days were for non-acute care with nearly 50% of those days spent waiting for placement. Waiting times were associated with the patient's choice of an ethnic or religious nursing home and the reluctance of nursing homes to accept high care level patients such as stroke and dialysis patients.

In summary, with the possible exception of mental impairment, the literature is inconclusive regarding the impact of other clinical characteristics on hospital length of stay. The factors that have the most significant influence on length of stay are the patients' family situation (living alone or without the necessary supports for daily living), and the placement preferences of patients and their family regarding long term care. These studies illustrate the importance of considering patients' socio-demographic characteristics, and destination at hospital separation, as both individual and health system factors that determine hospital length of stay.

2.4 Health System Factors

Because long-term care, like home support services, is not a publicly insured service in most Canadian provinces, there are financial implications for seniors who accept permanent placement in public nursing homes. Patients are required to pay a per diem board and lodging rate upon admission to a nursing home and some seniors are unable or unwilling to do so (Shapiro et al., 1980).

The patient's inability to pay for long-term care placement or alternate care arrangements such as home supports is a long- standing issue. Until the first half of the nineteenth century, the destitute poor in the United States were provided with custodial care in government run institutions known as "almshouses" (Gillick, 1989). This level of care was considered to be inappropriate for the "worthy poor", those who were poor due to misfortune rather than supposed sloth. Consequently, some private, ethnic and religious organizations cared for respectable poor older persons in facilities known as old age homes.

Shapiro et al. (1980) described the major changes to the Manitoba health care system introduced between the period of 1972 to 1976 to address geriatric acute care bed utilization, and the actual changes in utilization following these initiatives. Most of the recommended solutions had been introduced by 1975 including: major expansion of long-term rehabilitative and custodial care beds; publicly insured home care nursing and basic supportive home care services such as housekeeping, and increased numbers of geriatricians. In 1976 however, the average length of stay of the 'over 90 days stay' group had increased sharply in every age group and the oldest Winnipeg patients were

staying in hospitals approximately 30% longer for any condition than they would have in 1972. The researchers attributed the increased hospital utilization to the delays associated with transferring patients out of the acute care hospital to home, nursing homes and rehabilitation units. The authors cited three factors. First, the assessment and placement agency, which facilitated the placement of patients into the long-term care sector, gave the highest priority to placing community emergencies (high risk clients living in the community) rather than hospital patients. Second, patients could insist on remaining in the hospital until a bed in their preferred nursing home became available, thereby avoiding the cost of the per diem board and lodging fee required of nursing home patients. Third, nursing homes retained control over admissions and could refuse to admit eligible individuals, keeping them on a wait list for long periods. The researchers concluded that policy changes are required to address the transfer processes. For example, centralizing the screening and placement process and requiring patients to accept the first available nursing home bed until the home of their choice becomes available. The authors proposed another alternative; doing nothing, questioning why the problem of long stay patients in hospitals needs to be solved. They cite an example of an unnamed Canadian province that formalized a 'do nothing' approach and decreed that 15% of acute care beds in hospitals be reallocated to long term care, for example light care units, to accommodate patients awaiting transfers to long term care.

In a follow up study, Shapiro et al. (1992) identified patient characteristics and characteristics of long term care facilities that significantly affect the waiting time for transfer from hospital to nursing home. These researchers collected data from the hospital

records for the patients identified for transfer to a nursing home from an acute care bed between the periods of 1988 to 1989. The patient characteristics are previously referred to in Section 2.3 and include the patients' choice of nursing home as the factor having the greatest impact on waiting time in hospital. These researchers concluded that choice of nursing home, unlike age, sex or level of care, is one factor that can be addressed by policy. They cited two policy recommendations that were proposed by the Manitoba government appointed Task Force following a review of extended treatment beds in the province: 1) that all future LTC facilities in Winnipeg be secular; and 2) that the province establish a policy that would require patients to accept an interim placement in an available facility until their home of choice becomes available. The first recommendation was rejected outright following an organized negative response from the Boards of the ethno-religious homes. The second recommendation requiring patients to accept an interim placement had not been adopted at the time of the publication of this article in 1992. However, since 2000, alternate level of care patients in Winnipeg hospitals are required to accept interim accommodation (provided in two regional facilities) while waiting for permanent long-term care placement (Trish Bergal, Utilization Director, Winnipeg Regional Health Authority, personal communication, February 2004).

DeCoster and Kozyrskyj (2000) subsequently conducted a review of data on long stay patients in Winnipeg hospitals from 1991/92 to 1997/98. These researchers examined hospitalizations before, during and after the major changes in hospital and nursing home bed supply that included a reduction of 515 hospital beds and an increase of 429 nursing home beds during this period. They concluded that hospital bed closures

had little effect on hospital length of stay; there was a slight reduction in 1993/94 that may also have been due to the corresponding increase in nursing home beds the same year. Similar to Shapiro et al. (1992), these researchers found that the biggest influence on how long individuals stayed in hospital remained the destination at hospital separation, in particular waiting transfer to a nursing home. They also found wide variation in length of stay between hospitals and suggested there might be room for improved efficiencies within individual hospitals.

The key health system factors impacting hospital length of stay include the socio-demographic characteristics of patients and the lack of publicly insured long-term care arrangements. Additionally, long hospital stays are compounded when assessment and placement agencies give priority to placing high risk patients living in the community over hospitalized patients, hospitals permit patients to remain in acute care beds until their nursing home of choice becomes available, and nursing homes retain control over admissions and refuse to admit eligible individuals. Researchers identified that most of these health system issues can be addressed by policy changes; however these processes are unpopular and difficult to implement.

2.5 Interventions to Manage Hospital Length of Stay

Dwyer and Jackson (2001) conducted a systematic review of the literature on organizational and patient management practices that maximize the ability of hospitals to respond to the demand for patient care. This review, commissioned by the Department of Human Services Victoria, Australia, considered academic and government commissioned

reviews in that country and internationally for the previous five years. The researchers organized the findings under three main categories: 1) managing demand, for example strategies that reduce or better manage the demand for inpatient care such as providing a range of community-based health and home support services targeted to patients at risk for emergency admission; 2) improving throughput, for example managing hospital efficiencies to reduce the average time patients spend in hospital through the use of case management and discharge planning processes; and 3) balancing the system as a whole, for example providing appropriate sub-acute, post-acute and long-term care services to avoid hospitalization because alternate levels of care are not available. This model provided the conceptual framework for organizing the literature on interventions.

2.5.1 Interventions: Managing Hospital Demand

A UK study by Goodard, McDonagh, & Smith (1999) identified the frail elderly as the largest group of patients to occupy acute care beds beyond the acute care period. These researchers identified strategies such as targeted funding to build the capacity of community-based health and social services to prevent hospital admissions and shorten lengths of stay of seniors.

The Quick Response Team Project, a demonstration project in British Columbia, Canada, was successful at reducing acute care admission rates and the length of stay of seniors in medical, surgical and rehabilitation beds (LeBourdais, 1991). This intervention provided timely, short-term interdisciplinary professional and home support services to frail elderly patients in their homes. In addition to reducing hospital admissions and

lengths of stay, this project also had the unexpected outcome of reducing the number of requests for admission into long-term care facilities.

Hilder et al. (1998), citing the Auckland Healthcare Utilization Review (1997), identified there was an increase in the proportion of emergency or urgent hospital admissions compared to elective admissions for seniors. These emergent/urgent admissions were primarily related to cardiac and respiratory conditions and accounted for approximately two thirds of all admissions in the UK and about 60% of all medical admissions in New Zealand.

Similar findings were reported for Canada. Menec et al. (1999), in a study on hospital overcrowding in seven hospitals in Winnipeg over an11 year period. When seasonal patterns of emergency room use were examined, there was a large increase in hospital admissions during the winter months of December to April. Approximately 75% of all emergency room patients were over 65 years of age, admitted for the treatment of influenza-associated illnesses including pneumonia and other respiratory illnesses. These researchers suggest that these predictable pressure periods can be reduced with a major campaign to increase influenza vaccinations for high-risk groups, including seniors and individuals with chronic diseases.

Some emergency admissions, particularly of the elderly, occur because the hospital provides the only refuge for many people despite the inappropriateness of admission. Goodard et al. (1999) estimated that the rate of clinically inappropriate emergency admissions of elderly patients was about 20%, and women over 75 years of age use hospital beds for extended care.

2.5.2 Interventions: Improving Hospital Throughput

The literature describes a wide range of strategies to improve hospital throughput and reduce the length of stay of seniors such as providing acute geriatric programs and early discharge planning services (Brymer et al., 1995), and rehabilitation services and short stay facilities (Lambert and Arblaster, 1999). Additionally, there are a variety of mechanisms employed to predict the appropriateness of hospital admissions and manage the bed-day utilization. McDonagh, Smith, & Goodard (2000) evaluated the available tools and utilization review methods described in published studies. There are a number of limitations identified regarding formalized utilization review including: poor generalizability of instruments between health care systems and clinical practices; and instruments are generally weak regarding social indicators for sub acute and alternate levels of care.

The following describes some of the identified mechanisms to improve hospital throughput that have been reviewed in the literature; and those employed by the Health Care Corporation of St. John's.

4 Score Index

The 4 Score screening instrument was one of the earliest and most simplistic decision support tools to focus on the issue of patients remaining in hospital after medical treatments were completed. Glass et al. (1977) evaluated the effectiveness of the 4 Score screening instrument to determine the probability of prolonged hospital stays by 256 medical patients at a New York City hospital. Administered within 48 hours of admission, the 4 Score index recorded the number of positive responses to four questions:

1) Is the patient 80 years of age or older? 2) Will the patient live somewhere new upon discharge? 3) Is the patient in any way disoriented? 4) If so, is the disorientation chronic?

The responsible physician was contacted twice a week to determine when the patient was medically fit for discharge from the medical floor. The researchers state the sensitivity and specificity of the instrument can be improved however, they determined that a high 4 Score is strongly associated with "social stay' since patients with a low 4 Score had less frequent and shorter durations of non-medical hospital days. The researchers conclude that predictive value of the 4 Score index may be no better than the clinical judgment of a social worker or clinician attuned to the possibility of social stays. However, they suggest that using this tool allows for experimentation with a number of interventions to reduce the inappropriate utilization of hospital beds.

InterQual

InterQual is an American utilization instrument that measures clinical, diagnostic and therapeutic services that require hospitalization. DeCoster, Peterson, Carriere, & Kasian (1999) used this tool to assess the extent to which Manitoba's hospitals are used for acute care purposes. This was a retrospective, descriptive study of randomly selected patients admitted to 26 urban and rural hospitals in Manitoba during 1993-94. The data reviewed by a clinical working group demonstrated high rates of inappropriate admissions and length of stay. For example, only 55% of the patients who were admitted were assessed as requiring acute hospital care at the time of admission. A further 25% were assessed as requiring observation. The authors conclude that 16% of admissions and 26% of bed days could have been avoided had appropriate, alternate levels of care been

available.

A later version of InterQual was used in a large-scale Ontario study conducted in 1995 by Flintoft, Williams, Williams, Basinski, Blackstein-Hirsch, & Naylor (1998). Similar to DeCoster et al. (1999), they found low levels of acuteness at admission (62%) and length of stay (27.5%). They added a sub-acute category and found that sub-acute care increased with the age of the patients and accounted for 20% of all admissions and 40% of days of stay. Flintoft et al. (1998) concluded that earlier studies had overstated the inefficiency of Canadian hospitals by not considering sub-acute care needs. For example, all of the sub-acute patients required in-patient care but not necessarily in acute care hospitals.

Calculating Stages of Discharge

McClaren et al. (1991) suggested that the calculation of total length of stay as an indicator of hospital efficiency is inadequate when considering the impact of chronic status patients on acute care facilities. This two-year prospective study examined the length of stay of 115 chronic status patients in the Montreal General Hospital. The researchers identified discharge stages that contribute to prolonged stays and estimated the length of stay at each stage. In Quebec, these patients are easily identified because of the provincial requirement for physicians to formally declare when patients have achieved chronic status, thereby identifying non-acute days within the total length of stay.

The researchers constructed bed-day categories to reflect discharge stages for patients and they described the experiences of the patients at each stage. For example, Stage 1 reflects the total time spent in acute care (including time waiting to be declared

chronic status by the admitting physician). Stage 2 represents the chronic status period and includes the time waiting for the hospital to complete and submit the assessment for long-term care placement. Stage 3 identifies the time spent waiting for the application to be processed, and Stage 4 reflects the waiting time before actual transfer to the designated facility.

The researchers found that the number of patients decreased and the average wait increased as patients progressed to subsequent discharge stages. On average, only 8.7% of patient days were for acute care (Stage 1). The number of days spent in Stage 1, and Stage 2 (24.1%) were the responsibility of the hospital while Stage 3 (25.3% of patient days) was the shared responsibility of the hospital and the province. Stage 4, representing the provincial responsibility to provide access to nursing home beds, was most important for the patient and the hospital and accounted for 41.2% of all hospital days and 45.9% of chronic status days.

Hospital delays at Stage 2 were related to the timeliness of hospital staff completing the applications for placement. Delays at Stage 3 were related to the poor quality of the data provided by hospital staff to the long-term care facilities resulting in a high rate of return of applications to the hospital. The researchers suggest that the number of bed days in both stages could be improved through modifications in hospital procedures and improvements in the quality of applications.

The researchers found that delays at Stage 4 reflected a variety of problems with access to nursing home beds including: the lack of available beds; the ability of nursing homes to select the most desirable patients; financial barriers; and, a lack of coordination

between the hospital and community resources responsible for patient placement.

The study suggests that limiting the use of discharge data to calculate the length of stay of chronic status patients severely underestimates the average length of stay and provides unrealistic hospital utilization data. For example, using bed-day utilization measures, the total length of stay per patient in the study population was nearly four times that stated in the hospital annual report that considered only discharge data.

2.5.3 Interventions: Health Care Corporation of St. John's

This section will focus on the internal decision support mechanisms of the Health Care Corporation of St. John's employed during the time of this study, specifically, from January 1999 to June 2002.

In the spring of 1999, the Health Care Corporation of St. John's and Health and Community Services St. John's Region implemented a joint process to identify community emergency clients and prevent hospital admissions by providing appropriate community supports. A social work position was added to the Emergency Room team to assess elderly patients who were deemed medically inappropriate for hospital admission. The social worker, an employee of the Health Care Corporation of St. John's, with delegated authority from Health and Community Services St. John's Region to authorize and implement short-term (48 hours) home supports, negotiates a plan with the family to enable the patient to return home. This plan includes a referral to HCSSJR for follow-up assessment for long-term community supports and possible long term-care placement. Administrators of both organizations view this as an effective use of health system

resources (Gail Vaughan, Assistant Executive Director, Health and Community Services St. John's Region: personal communication, January 2003).

On-going interdisciplinary rounds of medical and surgical patients are in place to identify potential alternate level of care patients and process them for placement. Other mechanisms in place include; an Interagency Committee consisting of representatives from three health boards (HCC, HCSSJR, and SJNHB) that meets monthly to discuss issues and plan collaboratively. One of this Committee's initiatives was a review of the single entry process completed in 2002.

In 2000, the Health Care Corporation of St. John's implemented a process to review all surgical and medical admissions regarding appropriateness for admission. Using a modification of the Newfoundland Appropriateness Hospitalization Study Criteria (NAHSC), (Appendix G), the admission/discharge facilitator coordinates reviews of all patient admissions according to a variety of clinical, system and social criteria. Clinical examples include: severity of illness, such as sudden onset of unconsciousness; intensity of service, such as intravenous therapy; medical; and nursing/life support services. System indicators include in-hospital delays such as for surgery or diagnostic testing/results or transfers to appropriate alternative accommodations. Individual/social criteria include patient and /or family satisfaction with the alternative plan. Inappropriate admissions are identified and discussed with the responsible physician to initiate a discharge plan.

These processes were further refined in 2002 with the introduction of a new program regarding the expected date of discharge. This program uses medical care

mapping to determine the expected date of discharge of patients (based on the average length of stay for the identified condition) and introduces a protocol to address identified issues toward the specified expected discharge date. The Medical Care Map (Appendix H), a further modification of the Newfoundland Appropriateness Hospitalization Study Criteria, identifies key interventions, therapies and consultations used to monitor daily progress with the admission plan.

The Health Care Corporation of St. John's continues to direct resources to improve hospital bed-utilization statistics and is a partner with the other regional health boards to improve system efficiencies. However, the Health Care Corporation of St. John's continues to identify that system inefficiencies, including internal, and external health system processes, contribute to an unacceptable number of acute care beds being occupied by patients whose care needs can be met in other settings (George Tilley, Chief Executive Officer, Health Care Corporation St. John's, personal communication December 2003).

2.5.4 Interventions: Balancing the System

Most of the strategies to eliminate hospital blockages and maintain balance within the health care system focused on providing a range of community based and sub-acute care services for seniors.

Hider et al. (1998) identified that the majority of emergency room hospital admissions were cardiac care and respiratory conditions of the elderly. Managing the health system resources to respond to these unplanned emergency admissions is required

to avert any existing high bed-occupancy situation. As mentioned in Section 2.5.1, there is evidence of seasonal variation in hospital admissions of seniors for respiratory illnesses. In addition to recommending influenza vaccinations for vulnerable populations such as seniors, Menec et al. (1999), suggest temporarily converting surgical beds to medical beds during high pressure periods such as the winter 'flu season' when large numbers of seniors are admitted through emergency departments. These "swing beds" would be identified by rescheduling surgeries at times that are traditionally slower such as weekends, the last two weeks of December, and summer. The authors state that this strategy would require the cooperation of the medical staff and hospital administration to ensure the beds revert back after the crisis period.

Studies reviewed by Dwyer and Jackson (2000) regarding "bed blockers" identified "frail elderly as the largest single group of patients who occupy acute care beds beyond the acute phase of their illness" (p. 29). Researchers determined the causes related to an inadequate supply of post-acute and long-term care options. They cite an experience in Melbourne, Australia when additional post-acute/sub-acute beds were made available. The positive impact on the acute care beds was short lived as the new beds became "blocked" due to the continuing shortage of other long-term care options.

Balancing the system as a whole requires the cooperation of all system providers. As previously identified in Section 2.4, there are a variety of health system factors that can be addressed through intra-agency collaboration: including changes to the assessment and placement practices of the coordinating agency; and the admitting practices of nursing homes (Shapiro et al., 1980); and health system policy changes, such as

implementing a "first available bed" policy as identified by Shapiro et al. (1992).

2.6 Evaluations of Interventions

Shapiro et al. (1992) identified that there was a limited number of published evaluations of well-defined interventions employed to reduce the lengths of stay in acute care hospitals by elderly patients. Dwyer and Jackson (2001) in describing the methodology for their review of the literature on integrated bed and patient management practices identified the difficulty in establishing guidelines for the evaluation of interventions including management practices and policy changes. The authors state that it is unlikely that most of the interventions described in their review have been evaluated using randomized or comparative study designs. Many interventions are ideas, in contrast to pharmacological or surgical procedures, thus the conventional 'levels of evidence' approach is not very informative. They also state that it cannot be assumed that interventions are reproducible from one health care institution or system to another considering differences in professional cultures, management designs and other variables.

Chapter 3.0 Methods

3.1 Study Design

This study used a retrospective, observational pre-post design to assess the effectiveness of a transition bed program:

- on the hospital length of stay by alternate level of care seniors in the Health Care Corporation of St. John's.
- to provide appropriate, temporary alternate level of care for hospitalized seniors.

The study used administrative data from the Health Care Corporation of St. John's, and chart data from the transition-bed units (located at the Leonard A. Miller Centre and the Hoyles-Escasoni Complex), and single entry system data of Health and Community Services St. John's Region.

3.2 Study Populations and Study Periods

The study populations and study periods for the hospital outcome evaluation were:

- Alternate level of care seniors who occupied acute care hospital beds during three study periods: Period 1; January 1, 1999 to June 30, 1999 (baseline); Period 2; January 1, 2000 to June 30, 2000 (post-intervention 1), and Period 3; January 1, 2002 to June 30, 2002 (post-intervention)

The study populations and study periods for the transition-bed program process evaluation were:

- Patients who occupied transition-beds during two study periods: Period 2: January 1, 2000 to June 30, 2000 (baseline), and Period 3: January 1, 2002 to June 30, 2002 (post- intervention 1).

  Figure 3.1 depicts the study populations and study periods.

Figure 3.1

Study Populations and Study Periods

Hospital Outcome Evaluation[1]

Period 1	Period 2	Period 3
Baseline January 1,1999 – June 30, 1999	**Post-Intervention 1** January 1, 2000 – June 30, 2000	**Post-Intervention 2** January 1, 2002 – June 30, 2002

↕ ↕

Transition-Bed Program Process Evaluation[2]

Period 1	Period 2	Period 3
N/A	**Baseline** January 1, 2000 – June 30, 2000	**Post-Intervention 1** January 1, 2002 – June 30, 2002

[1] Hospital-bed alternate level of care seniors
[2] Transition-bed patients

3.2.1 Inclusion / Exclusion Criteria

3.2.1.1 Hospital-Bed patients

The hospital-bed study population included all patients age 65 years and over who occupied acute care beds of the Health Care Corporation of St. John's during the identified study periods, who met the following criteria: 1) total length of stay (LOS) >30 days (consistent with the American Hospital Association's use of a 30-day period to demarcate short from long-term hospital status (see Rosenfeld, 1957); 2) resident of Newfoundland and Labrador; and 3) declared as an alternate level of care patient (ALC).

Excluded from this study were hospital patients from two sites managed by the Health Care Corporation St. John's: the provincial psychiatric health care facility, the Waterford Hospital; and a rural community hospital, the Walter C. Templeton Hospital on Bell Island. These facilities were excluded because of the unique characteristics of their patient populations that contribute to longer than usual hospital lengths of stay. Specifically, patients of the Waterford Hospital often require specific accommodations or professional services that are not available in the regular nursing home sector. As a result, these seniors may remain at the Waterford Hospital for permanent long-term care. Because there is no long-term care facility on Bell Island, seniors are required to leave their home community to access permanent long-term care placement in the St. John's region. Consequently, alternate level of care seniors at the Walter C. Templeton Hospital are often permitted to remain at the hospital for extended periods to stay close to their families and friends.

3.2.1.2 Transition-Bed patients

The transition-bed study population included all patients who occupied the transition-beds during the identified study periods.

3.3 Data Collection

Appendix A identifies the source of each data element used for hospital-bed and transition-bed study populations.

3.3.1 Hospital-Bed Patients

Data on hospital-bed patients were retrieved from the electronic patient information systems of the Health Care Corporation of St. John's: (Meditech during Period 1 and 3M Health Information System during Period 2, 3). The hospital patient data included: patient registration number; Medical Care Plan number (MCP); age; date of birth; sex; residence; most responsible diagnosis (MRD); dates of admission and discharge; length of stay (LOS); alternate level of care days (ALC); status at hospital separation (for example dead or exit alive); and type of institution at hospital separation (where applicable).

There were limitations regarding the data available on the number of days patients were declared alternate level of care for Period 1. Two electronic patient information systems were in place in the Health Care Corporation of St. John's during the study periods; Meditech, (Period 1) and 3M Health Information System (during Period 2,3). Unlike the 3M System which specifies the number of alternate level of care days; the

Meditech system did not capture the actual number of days patients remained in hospital after being declared alternate level of care; this variable was subsumed within the total length of stay. The number of alternate level of care days for these patients was manually calculated using a working definition of 30 days as per the inclusion criteria, to demarcate short from long-term hospital status. A constant of 30 days was subtracted from the total length of stay for these patients. Although still valuable, the need for this calculation provided only an estimate of alternate level of care days for patients in Period 1.

3.3.2 Transition-Bed Patients

Health records for the transition-bed patients in each study period were requested using the patient's MCP number. Data were obtained from the paper health records of the Leonard A. Miller Care Center (LAMC) and the Hoyles-Escasoni Complex (HECx), and the electronic and paper health records from the single entry system of Health and Community Services St. John's Region (HCSSJR). The health records from the LAMC and HECx were audited using a template (Appendix B). From each chart, the patient's MCP was verified, and dates of admission and discharge; length of stay (LOS); level of care (LOC); and separation status were recorded.

A second chart audit tool (Appendix C) was used to verify and record patient data elements obtained from the electronic files of the single entry system including: the patient's MCP number and recording the status as "in-patient" of the Health Care Corporation of St. John's (identified by the date of referral from hospital to the single entry system), level of care, level of cognition, alternate level of care status and medically

stable status. Also recorded on this audit tool were data elements obtained from the paper health records of the single entry system including the patient's preference regarding choice of long-term care facility, and placement upon separation from the transition bed.

The chart audit tools were pre-tested on a sample of ten LAMC and HECx health records and on a sample of ten single entry health records between April and May 2003 to determine if all the selected data elements could be obtained from the data sources. The chart audit tools were satisfactory to obtain the required data.

3.4 Data Management/Linkage

All data elements for the hospital-bed patients in each study period were provided in Excel software. Each hospital-bed patient was assigned a study identification number and all data elements were coded and imported into the Statistical Program for Social Sciences (SPSS) for analysis. All data were verified to ensure there were no coding errors or duplication of records.

After linking the hospital bed-patients to the transition-bed patients using the MCP number, all transition bed patients were assigned a study identification number. Data elements for each transition-bed patient in both periods were recorded onto templates A and B ensuring that all the data elements for each patient were contained on both templates. Following verification of the data, the MCP numbers were destroyed. Data elements on individual patients from templates A and B (see Appendices B, C) were organized by era, coded, and put into a Microsoft Access data file and imported into SPSS. A summary of data variables, definitions and codes is provided in Appendix D.

After the data were linked, there were additional patients who occupied transition beds who were not included in the hospital study population; that is there were no data provided on these patients by the Health Care Corporation of St. John's. Since it was assumed that all transition bed patients would be admitted from the hospital study population; the missing data were discussed with the hospital health records manager who suggested that these patients might not have met all of the eligibility criteria selected for the hospital study population and therefore not identified by the selection process, for example, some of these patients may have had a hospital length of stay less than 30 days.

These transition-bed patients were also assigned study identification numbers and the selected data elements were recorded and managed as previously described. An examination of the data on these patients revealed that missing data elements for examination were the patient's age, sex and residence.

3. 5 Data Analysis

3.5.1 Dependent Variables

The dependent variables selected for the hospital-bed outcome evaluation were: the number of alternate level of care hospitalized seniors, the total length of stay for these patients, and the number of alternate level of care days. For Period 1, alternate level of care days were all days beyond the 30^{th} in-patient day. For Period 2, 3, alternate level of care days were determined by the electronic patient health information system of the Health Care Corporation of St John's (see Section 3.3.1).

The dependent variables for the transition-bed process evaluation were: the number of transition-bed patients, and the total length of stay of these patients in the transition beds. This was calculated by subtracting the date of admission from the date of discharge for each patient to determine the actual number of days.

3.5.2 Independent Variables

Independent variables for both study components were the study periods previously identified as follows: Period 1, (January 1, 1999 to June 30, 1999); Period 2, (January 1, 2000 to June 30, 2000), and Period 3; (January 1, 2002 to June 30, 2002), for hospital-bed seniors; and Period 2 (January 1, 2000 to June 30, 2000), and Period 3 (January 1, 2002 to June 30, 2002), for transition-bed patients. Another independent variable was transition-bed site; the Leonard A. Miller Center and the Hoyles-Escasoni Complex.

3.5.3 Other Variables

Other variables examined for the hospital-bed outcome evaluation included: patient demographic characteristics of age, sex, and place of residence of hospitalized alternate level of care seniors provided by the patient information systems. Age was recorded as a continuous variable; patient's sex was coded as a categorical variable. Regarding residence, the Meditech system (Period 1) did not provide data on residence for individual patients. Information about whether the patient resided inside or outside the

St. John's region was provided as a percentage of the sample population. Residence status for the other study periods were similarly converted and recorded as percentage.

Other variables for the hospital outcome evaluation were the patient clinical characteristics identified by the most responsible diagnosis (MRD), provided by the patient information systems, and hospital utilization variables including status at hospital separation (dead or exit alive) and type of institution at hospital separation (chronic, acute or palliative).

There were limitations regarding the clinical variable, the most responsible diagnosis (MRD), related to the fact that two patient diagnostic classification systems were in use during this study. In April 2000, the Health Care Corporation St. John's updated from version 9 International Classification of Disease Clinical Modification system (ICD-9-CM) to version 10 (ICD-10-CM). The ICD-10-CM codes were not compatible with the SPSS system so, in consultation with the health records manager, the ICD-10-CM codes were manually converted to the majority of the ICD-9-CM system. Diagnosis codes were subsequently grouped into seven categories; the six most common diagnostic groups, and "other".

Other variables for the transition-bed process evaluation included: patient demographic characteristics of age, sex and residence (available for the hospital-bed patient study population, see section 3.4) and clinical characteristics: levels of care and cognition, status as medical stable, and alternate level of care status. Variables selected for the utilization of the transition-beds were: the admission criteria (medically stable, declared alternate level of care, care level ≥ 3, "in-patient" of the Health Care

Corporation of St. John's, and applied for long-term care placement in the St. John's region); status at separation (dead or transfer); and choice of long-term care facility.

3.5.4 Analysis of Variables

Regarding the hospital outcome evaluation, it was assumed that there would be similarities regarding the demographic and clinical characteristics of the study populations in each study period. Means and standard deviations were used to describe the continuous variables, and frequencies were used for the categorical variables. Regarding the utilization of the acute care beds in each study period, it was assumed that there would be differences between Period 1 (baseline), and Period 2 (post-intervention 1); and similarities between Period 2, and Period 3 (post-intervention 2). To examine if differences occurred among the study populations across study periods, parametric statistics in the form of one-way analysis of variance (ANOVA) were used for the continuous variables, and non-parametric Chi-square tests of association were used for the categorical variables. The alpha levels for tests of association and difference were set at .05. Where applicable, Bonferroni post hoc analyses were used to identify specific group mean differences for ANOVA.

For the transition-bed program process evaluation, it was assumed that there would be similarities between the study populations for Period 2 (baseline) and Period 3 (post-intervention 1) regarding; the demographic and clinical characteristics, the program characteristics (admission criteria), and the utilization of the transition-beds. Means and standard deviations were used to describe the continuous variables, and frequencies were

used for the categorical variables. To examine if differences occurred between the study populations and study periods, parametric statistics in the form of t-tests were used. The alpha levels for tests of difference were set at .05. A summary of variables, definitions, and coding is presented in Appendix D.

The following describes the analyses of variables for each study objective.

Hospital-bed outcome evaluation:

- To describe the demographic and clinical characteristics of the alternate level of care seniors who occupied the acute care hospital beds in each of the study periods; frequency statistics were used. To examine differences in the patient characteristics across study periods; one-way analysis of variance (ANOVA) was used for the continuous variable of age, and Chi-square tests were used for the categorical variables of sex and residence.
- To analyze the utilization of acute care beds by alternate level of care seniors in each study period; frequencies (means and standard deviations) and ANOVA test statistics were used for the continuous variables of length of stay, alternate level of care days and the analyses of these variables according to the top six most responsible diagnoses and type of institution at hospital separation. Frequencies and ANOVA test statistics were also used for the categorical variables of exit code (dead or exit alive), and type of institution at hospital separation.

Transition-bed process evaluation:

- To describe the demographic and clinical characteristics of the transition-bed patients in each study period and at each transition-bed site; means and standard deviations

were used for the continuous variable of age, and frequencies were used for the categorical variables of sex, residence, declared alternate level of care, medically stable, care level ≥3 and level of cognition (cognitively well or impaired). To examine differences between the transition-bed populations, t-test statistics were used.

- To assess the appropriateness of admission into the transition beds (for example the patients' match with the admission criteria), frequencies were used for the categorical variables of declared alternate level of care, medically stable, care level ≥3, "in-patient" of the Health Care Corporation of St. John's, and applied for placement in St. John's. T-test statistics were used to determine whether the number of patients, admitted with reference to specific admission criteria, varied between study periods, and transition-bed sites.
- To analyze the utilization of the transition beds in each study period and at each transition-bed site, frequencies (means and standard deviations) and t-test statistics were used for the continuous variable of length of stay, and the analyses of the mean length of stay by cognition. Regarding the patients' status at separation from the transition beds, frequencies were used for the categorical variables of dead, first, second or third choice of placement, first available bed, and outside region.

3.6 Ethical Considerations

The Human Investigations Committee, Faculty of Medicine, Memorial University of Newfoundland and Labrador approved this study proposal on December 23, 2003

(Appendix E). Approval to undertake this research was also received from the participating Health Boards: Health Care Corporation of St. John's, February 3, 2003, Health and Community Services St. John's Region, February 19, 2003, and St. John's Nursing Home Board, February 28, 2003 (Appendix F).

Several measures were employed to protect confidentiality and secure data throughout the data collection, analysis and reporting processes. First, all identifying patient information (hospital registration numbers and MCP numbers) were deleted from the files (Microsoft Access and SPSS) once data elements were verified and linkage of patients was completed. The Excel patient health records from the Health Care Corporation of St. John's were subsequently returned to the health records manager. All references to patient MCP numbers, in the form of requests for electronic and paper health records of transition-bed patients, were destroyed following verification of data and entry into SPSS. All templates used to record transition bed data were secured in a locked cabinet. The SPSS data files and all reports of study findings contain no personal identifying information.

Chapter 4.0 Results

4.1 Study Populations

Table 4.1 presents an overview of the number of hospital-bed and transition-bed study populations. The total Health Care Corporation of St. John's hospital study population (N=346) in each study period was: Period 1 (n=107); Period 2 (n=111); and Period 3 (n=128). The total transition-bed study population (N=110) in each study period and site was: Period 2, (n=66); Leonard A.Miller Center (LAMC), [n=36], and Hoyles-Escasoni Complex (HECx), [n=30]; and Period 3, (n=44); LAMC, [n=22], and HECx, [n=22].

As previously mentioned, not all transition-bed patients came from the hospital study population as anticipated. In Period 1, the majority of HECx patients were transferred from the hospital (73.3%), while the majority at the LAMC site was not (38.9%). In Period 2, half of the transition-bed patients at both sites had been transferred from the hospital .

Table 4.1

Sample Size and Source of Study Populations

Study Populations[1]	Period 1		Period 2		Period 3	
	N	%	N	%	N	%
Hospital-bed Patients	107	30.9	111	32.1	128	37.0
Transition-bed Patients:						
LAMC			36	100	22	100
Hosp. Study Population			14	38.9	11	50
Other			22	61.1	11	50
HECx			30	100	22	100
Hosp. Study Population			22	73.3	11	50
Other			8	26.7	11	50

[1] LAMC refers to Leonard A. Miller Center; HECx refers to Hoyles-Escasoni Complex

4.2 Hospital Outcome Evaluation

4.2.1 Demographic Characteristics

Table 4.2 shows that, across the three study periods, the hospital-bed patients did not differ significantly with regard to chronological age (F (2, 345) = .68, $p > .05$) or sex (χ^2 (1) = .42, $p > .05$). Additionally, in each study period, the vast majority of hospital-bed patients originated from the St. John's region (82 - 84 %) (χ^2 (2) = .164, $p > .05$).

Table 4.2

Demographic Characteristics of Hospital-Bed Patients by Study Period

Variable	Period1 (n=107)		Period 2 (n=111)		Period 3 (n=128)		P value
	M	SD	M	SD	M	SD	
Age	80.7	7.14	79.7	7.77	79.8	6.39	.507
	N	%	N	%	N	%	
Sex: Male	48	44.9	54	49.6	65	50.8	.519
Female	59	55.1	57	51.4	63	49.2	
Residence [1]							.921
St. John's	90	84.1	94	84.7	106	82.8	
Outside	17	15.8	17	15.3	22	17.2	

4.2.2 Clinical Characteristics

The clinical characteristics are reflected by the most responsible diagnosis (MRD). As shown in Table 4.3, the majority of the sample could be classified according to the six most common MRD groups (63.8%). The sample sizes for three MRD groups (malignant neoplasms, dementia and pneumonia) were very small. Visual inspection of the data revealed that there was minimal variation across periods with respect to the number of patients meeting the diagnostic criteria for any of the most responsible diagnoses.

Table 4.3

Clinical Characteristics of Hospital-Bed Patients by Study Period

Most Responsible Diagnosis (MRD)	Period 1 (n= 107)		Period 2 (n=111)		Period 3 (n=128)	
	N	%	N	%	N	%
Fracture	22	20.6	22	19.8	22	17.2
CVD	17	15.9	21	18.9	19	14.8
CHD	12	11.2	13	11.7	14	10.9
Malignant Neoplasms	4	3.7	10	9.0	11	8.6
Pneumonia	4	3.7	10	9.0	5	3.9
Dementia	6	5.6	5	4.5	3	2.3
Other	42	39.3	30	27	54	42.3

Most Responsible Diagnoses: Fractures (all types), Cerebral Vascular Disease (CVD), Coronary Heart Disease (CHD), Malignant Neoplasms, Pneumonia, Dementia, Other: infections, mental illness, kidney disease, etc.

4.2.3 Utilization of Acute Care Beds

4.2.3.1 Length of Stay

Several analyses were conducted with respect to the length of stay. First, as a main effect, the mean length of stay for Period 1 was 69 days (SD 49.9); Period 2, 54 days (SD 25.6) and Period 3, 69 days (SD 45.4), and the mean length of stay differed significantly among the three study periods (F (2, 345) = 4.91, $p < .05$) (see Table 4.4). Post-hoc comparisons revealed that the length of stay was significantly shorter in Period 2, compared to either Period 1, (MD = 15.06, $p < .05$), or Period 3, (MD = 14.99, $p < .05$).

Second, differences in length of stay were analyzed with respect to the patient clinical characteristics reflected by the most responsible diagnosis. Specifically, length of stay was analyzed regarding the top six most responsible diagnoses (MRD). As shown in Table 4.5, across study periods, there was a significant difference in length of stay with respect to the diagnosis of coronary heart disease (CHD) (F (2, 39) = 4.08, $p < .05$). Post-hoc analyses revealed that the length of stay for coronary heart disease patients was significantly shorter in Period 2, compared to Period 3, (MD = 33.59, $p < .05$).

Table 4.4

ANOVA of Length of Stay and Alternate Level of Care Days of Hospital-Bed Patients by Study Period

Characteristic	Period 1 (n=107)		Period 2 (n=111)		Period 3 (n=128)		P Value
	M	SD	M	SD	M	SD	
Length of Stay (LOS)	68.9	49.9	53.9	25.6	68.9	45.4	.008
Alternate Level of Care Days (ALC)	38.9	49.9	26.1	18.2	40.3	43.7	.013

Table 4.5

ANOVA of Length of Stay of Hospital-Bed Patients by Clinical Characteristics by Study Period

Most Responsible Diagnosis (MRD)	Period 1 (n= 107)		Period 2 (n=111)		Period 3 (n=128)		P value
	M	SD	M	SD	M	SD	
Fracture	68.6	33.6	51.4	15.0	64.0	31.4	.115
CVD	61.1	26.5	55.2	24.9	51.2	18.6	.449
CHD	66.7	28.2	48.7	12.7	82.3	42.0	.025
Malignant Neoplasms	60.3	32.0	54.8	45.6	70.5	47.8	.725
Pneumonia	85.0	33.2	69.8	32.1	120.3	83.8	.770
Dementia	51.5	8.7	48.1	14.6	44.6	16.4	.360

Most Responsible Diagnoses: Fractures (all types), Cerebral Vascular Disease (CVD), Coronary Heart Disease (CHD), Malignant Neoplasms, Pneumonia, Dementia.

4.2.3.2 Alternate Level of Care Days

Several analyses were conducted with respect to the number of alternate level of care patient days. First, as a main effect, the mean alternate level of care days for Period 1 was 39 days (SD 49.9); Period 2, 26 days (SD 18.2) and Period 3, 40 days (SD 43.7), and the means differed significantly across study periods ($\underline{F}$ (2, 345) = 4.40, $\underline{p} < .05$) (see Table 4.4). Post-hoc analyses revealed that the number of alternate level of care patient days was significantly fewer in Period 2 compared to Period 1 (MD = 12.84, $\underline{p} < 05$), and Period 3 (MD = -14.16, $\underline{p} < .05$).

Second, differences in the number of alternate level of care days were analyzed with respect to the clinical characteristics reflected by the most responsible diagnosis (MRD) for each patient (see Table 4.6). There was a significant difference across study periods with respect to the diagnosis of coronary heart disease (CHD) ($\underline{F}$ (2, 345) = 5.34, $\underline{p} < .05$) (see Table 4.6). Post-hoc analyses revealed that there was significantly fewer alternate level of care days for patients with a diagnosis of coronary heart disease in Period 2 than in Period 3 (MD = 40.11, $\underline{p} < .01$).

Third, alternate level of care days were analyzed with respect to the type of institution at hospital separation for example, chronic or acute care facilities (the number of patients discharged to palliative care facilities was insufficient to compute accurate analyses). As shown in Table 4.7, the mean alternate level of care days for patients discharged to chronic care facilities in Period 1 was 39 days (SD 32.3); Period 2, 28 days (SD 18.4); and Period 3, 59 days (SD 58.6); the means did not differ significantly across study periods ($\underline{F}$ (79,175) = .940, $\underline{p} > .05$). Regarding discharges to acute care facilities,

the mean alternate level of care days was highest in Period 1 (54 days, SD 27.7) compared to either Period 2 (21 days, SD 11.9) or Period 3 (28 days, SD 23.1). This difference was significant across study periods (F (2,220) =3.21, $p < .05$) (see Table 4.7).

Table 4.6

ANOVA of Alternate Level of Care Days of Hospital-Bed Patients by Clinical Characteristics by Study Period

Most Responsible Diagnosis (MRD)	Period 1 (n= 107)		Period 2 (n=111)		Period 3 (n=128)		P value
	M	SD	M	SD	M	SD	
Fracture	38.6	33.6	31.5	17.2	45.0	32.4	.301
CVD	31.1	26.5	30.6	18.4	26.3	18.3	.748
CHD	36.7	28.2	16.4	11.7	56.5	44.9	.009
Malignant Neoplasms	30.3	32.0	13.9	7.5	38.9	39.4	.172
Pneumonia	21.5	8.7	22.0	20.0	11.8	8.9	.501
Dementia	55.0	33.2	15.0	19.1	103.3	88.4	.063

Most Responsible Diagnoses: Fractures (all types), Cerebral Vascular Disease (CVD), Coronary Heart Disease (CHD), Malignant Neoplasms, Pneumonia, Dementia.

Table 4.7

ANOVA of Hospital-Bed Patients' Alternate Level of Care Days: Total Study Population and by Type of Institution at Hospital Separation

Characteristic	Period 1 (n=107)		Period 1 (n=111)		Period 1 (n=128)		P value
	M	SD	M	SD	M	SD	
To Chronic Care Facility	38.9	32.3	27.7	18.4	58.7	58.6	.611
To Acute Care Facility	53.5	27.7	21.4	11.9	27.5	23.1	.042
Total Study Population	38.9	49.9	26.1	18.2	40.3	43.7	.013

4.2.3.3 Status at Hospital Separation

The hospital patient information systems recorded two categories of separation (dead or exit alive) and three types of institutions at separation; chronic (included transition beds in Period 2, 3), acute, and palliative care facilities. Discharges to home/community were not captured by the patient information systems.

Between Period 1 and Period 3 inclusive, the majority of the patients exited alive (89.9%) and this rate did not vary significantly across study periods (F (1,345) = .036, p >.05) (see Table 4.8).

Of those discharged to institutions however, there was a significant difference across periods regarding the number of discharges to acute care facilities (F (2,220) = 5.20, $p < .05$) (see Table 4.8). There was a 3.3% increase the number of patients discharged to acute care facilities between the first and second period, and a further increase of 7.1% between the second and third periods.

Of the patients discharged to institutions, the majority was discharged to chronic care facilities (57.2%). Also, the data indicates that there was a decrease in the percentage of patients discharged to chronic care facilities across study periods (see Table 4.8). For example, between the first and second periods, there was an 8.2% decrease in the number of discharges to chronic care facilities and a further 14.1% decrease between the second and third periods

Table 4. 8:

ANOVA of Hospital-Bed Patients at Hospital Separation

Characteristic	Period 1 (n=107)		Period 2 (n=111)		Period 3 (n=128)		P value
	N	%	N	%	N	%	
Exit Alive	95	88.8	103	92.8	113	88.3	.850
Chronic [1]	64	67.4	61	59.2	51	45.1	
Acute [2]	8	8.4	12	11.7	23	20.4	.006
Palliative	1	1.1	1	.97	0	0	
Other[3]	22	23.2	29	28.2	39	34.5	N/A

[1]Chronic: Includes transition beds in Period 2,3.
[2]Acute: Includes hospitals within HCCSJ and outside region.
[3]Other: Assumed to be discharges to home.

4.3 Transition-Bed Program Process Evaluation

4.3.1 Demographic Characteristics

As previously mentioned, demographic data on some transition-bed patients were not available because they were not included in the hospital study population as anticipated (see section 3.4). Table 4.9 analyzes the available demographic data for the transition-bed patients; Period 2, n=36, (N=66); Period 3, n=23, (N=44). While acknowledging the limitations associated with the data, there was no significant difference between study periods regarding age (t (58) =85.03, $p > .05$); the mean patient age of transition-bed patients in Period 2 was (83.1 years; SD 7.95), and Period 3 (83.7 years; SD 6.35). Also, There was no significant difference between study periods for sex (t (58) = 20.07, $p > .05$) (see Table 4.9).

Table 4.9

Demographic Characteristics of Transition-Bed Patients by Study Period *

Characteristic	Period 2 (n=36) [1]		Period 3 (n=23) [2]		P Value
	M	**SD**	**M**	**SD**	
Age	83.1	7.95	83.7	6.35	.673
	N	**%**	**N**	**%**	
Sex: Female	18	50	9	50	.422
Male	18	50	14	50	
Residence:					
St. John's	36	100	23	100	N/A
Outside					

*Calculations made on available data ([1] Period 2, n=36, (N=66); Period 3, n=23, (N=44).

4.3.2 Clinical Characteristics

Table 4.10 summarizes the clinical characteristics of the total transition-bed study population in each study period. Between study periods, there were significant differences in the percentage of patients declared as alternate level of care (t (107) = -24.61, $p < .05$) and care level ≥3 (t (109) = 31.05, $p <. 05$) (see Table 4.10).

Table 4.10

T-Test of Clinical Characteristics of Transition-Bed Patients by Study Period

Characteristic	Period 2 (n=66)		Period 3 (n=44)		P value
	N	%	N	%	
Declared ALC[1]	65	98.5	36	83.7	.001
Medically Stable	52	78.8	37	86.0	.424
Care Level ≥3[1]	52	78.8	43	97.7	.004
Cognitively Well	39	60.0	33	78.6	.054

[1] Sample size varies with amount of missing data.

Table 4.11 summarizes the clinical characteristics for the Leonard A. Miller Centre transition-bed patients in each study period. There was a significant difference between periods regarding the number of patients declared as alternate level of care, (t (55) = -16.61, $p < .05$).

Table 4.11

T-Test of Clinical Characteristics of LAMC Transition-Bed Patients by Study Period

Characteristic	Period 2 (n=36)		Period 3 (n=22)		P value
	N	%	N	%	
Declared ALC[1]	35	97.2	16	76.2	.002
Medically Stable	29	82.9	16	76.2	.516
Care Level ≥3[1]	27	77.1	21	100	.061
Cognitively Well	20	57.1	15	71.4	.288

[1] Sample size varies with amount of missing data.

The clinical characteristics of the Hoyles-Escasoni Complex transition-bed patients are presented in Table 4.12. There were no significant differences between study periods for these patients in terms of whether they were declared as alternate level of care, medically stable, had a care level greater or equal to 3, or were cognitively well (see Table 4.12).

Table 4.12

T-Test of Clinical Characteristics of HECx Transition-Bed Patients by Study Period

Characteristic	Period 2 (n=30)		Period 3 (n=22)		P value
	N	%	N	%	
Declared ALC[1]	30	100	20	90.9	.087
Medically Stable	23	76.7	21	95.5	.071
Care Level ≥3[1]	25	83.3	22	100	.051
Cognitively Well	19	63.3	18	85.7	.080

[1] Sample size varies with amount of missing data.

4.3.3 Appropriateness of Admission

As previously mentioned, the criteria for patients to be admitted into the transition-bed program included: declared as alternate level of care, medically stable, care level ≥3, "in-patient" of the Health Care Corporation of St. John's, and applied for (long-term care) placement in the St. John's region. The total transition-bed study population (N=110) was divided by study period and site (see Table 4.1).

Table 4.13 summarizes the LAMC and HECx patients' match with the established criteria for admission into the transition-bed program. There was a significant difference regarding compliance with the admission criteria of 'applied for placement in the St. John's region' ($t(107) = -12.06$, $p < .05$).

Table 4.13

T-Test of Transition-Bed Patients' Match with Specific Admission Criteria

Characteristic	LAMC (n=58)		HECx (n=52)		P value
	N	%	N	%	
Declared ALC	51	91.1	50	96.2	.288
Medically Stable	45	80.4	44	84.6	.566
Care Level ≥3	48	85.7	47	90.4	.251
Applied LTC St. John's	44	78.6	50	96.2	.006
"In-Patient" of HCCSJ	53	91.4	52	100	N/A
Other[1]	5	8.62	N/A	N/A	N/A

[1] Other: includes patients admitted directly into transition-beds from the HCCSJ Emergency Room (and not "in-patients").

Patients in each site were further grouped to determine the degree of match with the established admission criteria; for example, patients were grouped with either a low match (< 4 criteria) or a high match (≥ 4 criteria). As shown in Table 4.14, as a main effect, by study period, the overwhelming majority of patients were classified as high match regardless of institution.

Table 4.14

Summary of Transition-Bed Patients' Match with Established Admission Criteria

Characteristic	LAMC (n=58)		HECx (n=52)	
	N	%	N	%
Match:				
High (≥4)	50	89.3	51	98.1

4.3.4 Utilization of Transition-Beds

4.3.4.1 Length of Stay

As shown in Table 4.15 for both study periods, the mean length of stay of patients at the Leonard A. Miller Centre transition-bed site was 80.03 days (SD =69.2) compared to the mean length of stay of Hoyles-Escasoni Complex patients of 94.98 days (SD =72.5). As a main effect, the length of stay did not differ between periods ($t(108) = 12.63$, $p > .05$).

Although the overall length of stay did not vary between periods for the patient populations as a whole, a further examination was conducted to determine if the length of stay was affected by the cognitive status of the transition-bed patients. As such, the patients for each site and for each study period were classified as either cognitively well or cognitively impaired.

As shown in Table 4.15, the mean length of stay of the cognitively well patients in both transition bed sites was higher than the mean length of stay of the patients as a whole. For example, at the LAMC site, the mean length of stay of the cognitively well patients was 88 days (SD =76.1) versus the length of stay of the total patient population of 80 days (SD = 69.2). Similarly, at the HECx site, the mean length of stay of cognitively well patients was 110 days (SD = 76.8) versus 95 days (SD = 72.5) for the total population. As a main effect, there was no significant difference between sites or study periods for length of stay of transition bed patients by cognition. However, the mean length of stay for cognitively impaired patients in both sites was less than the mean

length of stay for the general patient populations.

Table 4.15

T-Test of Length of Stay of Transition-Bed Patients: Total Study Population and by Level of Cognition

Characteristic	LAMC (n=58)		HECx (n=52)		P value
	M	SD	M	SD	
Length of Stay: Total	80.0	69.2	94.9	72.5	.273
Length of Stay: Cognitively Well	87.9	76.1	109.7	76.8	.161
Cognitively Impaired	67.9	59.3	59.1	47.7	

4.3.4.2 Status at Transition-Bed Separation

Data were collected regarding all patient separation outcomes, by site (LAMC, HECx) and study period (Period 2, 3). Data were classified with reference to one of four categories: died; accepted placement in home of choice or second choice; accepted third choice placement or first available bed; other, which included transfer to private facility or out of region.

As shown in Table 4.16, upon separation from the transition beds, the majority of patients in both sites transferred to other long-term care facilities or outside the region: LAMC (79.3%); HECx (80.8%). Regarding choice of placement, fewer patients at the HECx site received their first or second choice than patients at the LAMC site (26.9% versus 41.4% respectively). However, more HECx patients accepted the third or first available bed placement than LAMC patients (46.2% versus 20.7% respectively).

The percentage of patients who died did not vary between transition bed sites (LAMC, 20.7%, HECx 19.2%).

Table 4.16

Summary of Transition-Bed Patients' Status at Separation

Characteristic	LAMC (n=58)		HECx (n=52)	
	N	%	N	%
Died	12	20.7	10	19.2
1st Choice, 2nd Choice	24	41.4	14	26.9
3rd Choice, 1st Available Bed	12	20.7	24	46.2
Outside Region, Other	10	17.2	4	7.7

Chapter 5.0 Discussion

5.1 Hospital Outcome Evaluation

5.1.1 Demographic Characteristics

The mean age of the hospital-bed patients remained consistent between study periods: Period 1, 80.7 years; Period 2, 79.7 years; and Period 3, 79.8 years. There were more females than males in the first and second periods: Period 1, 55 % females compared to 45% males; and Period 2, 51% females compared to 50% males. In Period 3, the number of males was slightly higher than females; 51% males compared to 49 % females. These findings are consistent with Shapiro et al. (1992) who reported the mean age of hospital seniors waiting transfer to nursing homes (N=366) was 80.3 years; and Shapiro et al (1992), that hospital patients with the most serious problems are women, and people age 75 years or more.

Regarding place of residence as a factor affecting hospital length of stay, two Canadian studies (Shapiro et al.,1980; DeCoster and Kozyrskyj, 2000) examined this variable. Researchers found that being a resident of the city of Winnipeg had no influence on the length of stay in Winnipeg hospitals. In the current study, place of residence was an important local indicator selected because administrators of the Health Care Corporation of St. John's perceived a problem with the high number of patients awaiting transfer to institutions or communities outside the St. John's region. Reasons cited for the delays included the unavailability of some community support services and the expected delays in the single entry placement process for those patients who choose to seek long-term care placement in the St. John's region (Elliott, 2002). This study's findings

indicated a consistently high percentage of patients of alternate level of care seniors from the St. John's region (between 83% and 85%) in each study period.

5.1.2 Clinical Characteristics

The current study identified consistency regarding the top six (6) most responsible diagnoses (MRD) across the three study periods specifically: fractures (all types); cerebral vascular disease (CVD); coronary heart disease (CHD); malignant neoplasms (cancers); pneumonia; and dementia. This is similar to the provincial data on hospital admissions for 1999/2000 for adults 65 years and over: hip replacements; cancer; and circulatory disorders (Government of Newfoundland and Labrador, 2001) and DeCoster and Kozyrskyj (2000): stroke; heart disease; and musculoskeletal diseases.

Provincial hospital data collected from 1994 to 1999, identified women aged 75 years and over as almost three times more likely to be admitted to hospital with a fractured hip than men of the same age (Newfoundland and Labrador Center for Health Information, 2003). The causes identified for falls in older persons include: natural deterioration of vision, hearing, reflexes, muscle and bone mass, as well as chronic diseases and prescription drug use. This type and level of analysis supports the need for important institutional and public education initiatives regarding the prevention of falls and other seniors' related health promotion initiatives

Findings by Shapiro et al. (1980) suggested that seniors' cognitive impairment had no significant impact on hospital length of stay. This is inconsistent with other studies that identified mental impairment as one of the factors extending hospital length

of stay (Markson et al., 1983; Hilder et al., 1998; DeCoster and Kozyrskyj, 2000). In the current study, information regarding this clinical characteristic was limited to the examination of dementia as the most responsible diagnosis (MRD) upon admission to hospital and, as previously discussed, the sample sizes for this MRD were very small. Given the standing in the literature regarding this patient characteristic and its impact on hospital length of stay, future bed-utilization studies might consider examining dementia as a co-morbid/secondary diagnostic classification for seniors. This level of data is currently available from the 3M HIS patient information system of the Health Care Corporation of St. John's. Patients' cognitive status however was one of the variables analyzed for the transition-bed patients and is discussed in Section 5.2.1 of the Transition-Bed Program Process Evaluation.

5.1.3 Utilization of Acute Care Beds

5.1.3.1 Length of Stay

In the literature, there is a wide range of recorded lengths of stay for elderly patients in acute care hospitals. For example, Harris et al. (1997) examined the hospital separations of 214 patients (90 to 99 years of age) at a major teaching hospital in Adelaide, Australia. These researchers found the mean length of stay for these patients was 6.9 days compared to 3.7 days for the total in-patient population. DeCoster and Kozyrskyj (2000), in their study of patients in Winnipeg hospitals with various post hospital destinations, found the average length of stay of patients awaiting permanent placement in a long-term care facility was 170 days compared to 82 days for patients who died in hospital, 81 days for patients transferred to another hospital, and 58 days for patients discharged home.

In the current study, the total mean lengths of stay for alternate level of care seniors varied across study periods; from 69 days in Period 1; 54 days in Period 2; and 69 days in Period 3. These mean lengths of stay, though significant in this study, were within the ranges previously cited from the literature.

As previously reported, the length of stay was significantly shorter in the second period as compared to Period 1 or Period 3. As a preliminary outcome finding, it appeared that the transition-bed program, introduced six months prior to the first study period, had a positive impact on reducing the length of stay of seniors in acute care beds. The study's findings indicate that reduced length of stay was not sustained in the third period. Other factors must therefore be considered regarding the outcome of reduced

length of stay in Period 2 such as the combined effect of the processes introduced by the Health Care Corporation of St. John's to address the issue of inappropriate utilization of acute care beds (see Section 2.5.2).

Most responsible diagnosis (MRD) was also used to analyze the length of stay. There was a significant difference across study periods regarding the length of stay for coronary heart disease patients (see Table 4.5). Possible reasons for this might include changes in the coding for these conditions between the ICD-9-CM and ICD-10-CM classification systems.

5.1.3.2 Alternate Level of Care Days

Generally, the findings regarding the number of alternate level of care days were similar to those for length of stay; specifically, patient days differed across study periods with the average number of alternate level of care patient days being significantly fewer in Period 2, (26 days) compared to either Period 1, (39 days), or Period 3, (40 days). Also similar to the findings regarding length of stay; as a preliminary outcome, it would appear that the transition-bed program had a positive impact on reducing the number of alternate level of care days by seniors. However, because this study identified that the reduction was not sustained; other reasons previously cited for reducing length of stay (internal Health Care Corporation of St. John's bed utilization strategies) need to be considered regarding alternate level of care patient days.

Most responsible diagnosis (MRD) was also used to analyze the alternate level of care days. As previously reported, there was a significant difference across study periods

regarding the alternate level of care days for coronary heart disease patients. Possible reasons for this might include changes in the coding for these conditions between the ICD-9-CM and ICD-10-CM classification systems.

Because it is the number of alternate level of care days that most accurately reflects the time patients spend in acute care beds waiting for discharge or transfer; this variable was further considered according to discharge destination (type of institution at hospital separation). As previously reported, there were significant differences between study periods, regarding the increased number of transfers to acute care facilities; and a reduction in the mean alternate level of care days for patients transferred to acute care facilities. Though attributable to a small percentage (7.5%) of the total study population, the situation of reduced alternate level of care days in the Health Care Corporation of St. John's corresponding with increased transfers to other acute care facilities, should be further explored and monitored. It is important to ensure that there are standardized mechanisms to identify and appropriately transfer these patients within the health care system to reduce the potential of inappropriate utilization of acute care resources between facilities.

5.1.3.3 Status at Hospital Separation

This study examined patient status at hospital separation as one of the health system factors that impact hospital length of stay. Several studies found that the destination at hospital discharge was an important predictor of length of stay (Shapiro et al., 1992; Harris et al., 1997); DeCoster and Kozyrsky, 2000). As previously reported by

Harris et al. (1997), 90% of elderly patients survived their hospitalization and returned directly to their previous living circumstances.

The current study identified that 89% of alternate level of care seniors of the Health Care Corporation of St. John's were alive upon separation from hospital, however, the majority of these patients (57%) were transferred to a chronic care facility (this included the transition-beds in the second and third periods) versus being discharged to home (28%). This finding is inconsistent with DeCoster and Kozyrskyj (2000); 52% of adults (18 years of age and over) were discharged to home, and 13% transferred to nursing homes or personal care homes. It is also inconsistent with the information provided by Elliott (2002) that most elderly patients of the Health Care Corporation of St. John's return directly to their previous living arrangements with or without home supports. This study finding suggests that the availability of transition-beds was a preferred option by alternate level of care seniors over returning home. Future studies on the appropriate utilization of health system resources by seniors should include an examination of patient and family perceptions regarding the available options for post-acute care requirements.

Shapiro et al. (1992) found the patient's choice of nursing home to have the single strongest influence on hospital length of stay. In the current study, the patient information system of the Health Care Corporation of St. John's did not provide information regarding the patient's choice of nursing home at the time of hospital separation. This variable however was used to analyze the utilization of the transition beds and is discussed in Section 5.2.3: Transition-Bed Program Process Evaluation.

As previously reported, there was a significant increase in the number of transfers to acute care facilities over the three study periods, and an overall decrease in the number of transfers to chronic care facilities. It is assumed that the majority of the discharges to acute care facilities refer to alternate level of care patients awaiting transfers to their home hospital rather than being admitted into another acute care facility of the Health Care Corporation of St. John's. Based on this current study, it would appear that these findings should be further explored within the context of the health system as a whole. For example, it would be important to determine why there were fewer admissions to chronic care facilities and more admissions to acute care facilities, within or outside the St. John's region. This study suggests that it is possible that the perceived problem of blocked beds by alternate level of care seniors in one acute care hospital is being transferred to another without addressing the associated issues such as appropriate alternate services or pressure points within the health system.

5.1.4 Summary: Hospital Outcome Evaluation

A variety of individual and health system factors were examined to determine the effectiveness of the transition-bed program on the hospital length of stay by alternate level of care seniors in three study periods. There were no significant differences in demographic or clinical characteristics that impacted the hospital length of stay. However, there is general support in the literature that cognitive impairment is a barrier to efficient transfer/discharge of patients from hospital (Markson et al. 1983; Hilder et al. 1998; DeCoster and Kozyrskyj, 2000). There was limited examination in this current

study regarding the impact of cognitive status on hospital length of stay. Future bed-utilization studies might consider including dementia as a co-morbid/secondary diagnostic classification for seniors.

The results of this study indicated that there were significant differences in the length of stay and the number of alternate level of care days during the second study period. These reductions were not sustained during the third study period suggesting that the transition-bed program may have had a short-term effect on reducing the hospital length of stay by alternate level of care seniors. These findings are similar to an Australian study cited by Dwyer and Jackson (2000) regarding an experience whereby additional post-acute/sub-acute beds were available to address the issue of seniors occupying acute care beds beyond their acute phase of their illness. In that study, the positive impact on the acute care beds was short lived as the new beds became blocked because of the continuing shortage of other long-term care options.

There were unexpected findings regarding the status of alternate level of care seniors at hospital separation. The current study identified that the majority of these patients (57%) were transferred to chronic care facilities (this included the transition-beds in the second and third periods) versus being discharged to home (28%). This finding is inconsistent with the findings of DeCoster and Kozyrskyj (2000), and the information provided by Elliott (2002) that most elderly patients of the Health Care Corporation of St. John's return directly to their previous living arrangements with or without home supports. This study finding suggests that transition-bed placement, as an interim arrangement to permanent nursing home placement, was a preferred option for this study

population versus returning home. Future studies on the appropriate utilization of health system resources by seniors should include an examination of patient and family perceptions/preferences regarding the available options for post-acute care requirements. Also, it would be important to determine if the transition-bed program was a cost-effective measure to address hospital length of stay by seniors.

There were also unexpected findings regarding the types of institutions to which patients were transferred at hospital separation: decreased number of transfers to chronic care facilities; increased number of transfers to acute care facilities; and a reduction in the mean alternate level of care days for patients transferred to acute care facilities. Though attributable to a small number of patients, this study suggests that to achieve efficiencies within the health system as a whole, there should be a standardized approach to the identification of alternate level of care patients, and the transfer of these patients between acute care facilities in the province. Additionally, this study suggests that health system administrators consider patients' total length of hospital stay, in addition to the alternate level of care status, upon transfer into transition-beds. This will enhance the appropriate utilization of the acute care resources, and provide more timely and appropriate level of care for these seniors.

Findings from this current study suggest that the outcome evaluation of the impact of the transition-bed program, as a single approach to the issue of hospitalized alternate level of care seniors, had no lasting effect. There are a variety of individual and health system factors that impact the length of stay of seniors in acute care settings including: a lack of alternative services, a lack of coordination between system components (hospital,

placement agencies and nursing homes), and policy decisions that do not support the changes necessary to address some of the identified issues. These multi-dimensional factors would suggest that a coordinated, health systems approach is required to address the complex issue of long hospital stays by alternate level of care seniors.

5.2 Transition-Bed Program Process Evaluation

5.2.1 Demographic and Clinical Characteristics

Demographic characteristics were unavailable for a large percentage of the transition-bed study population; 45.5% in Period 1, and 47.8% in Period 2 (see Section 3.4). Though limited, the analyses of available data showed there were no significant differences in the demographic characteristics of age, sex and residence. Based on available data, the average mean age of the transition-bed patients (83 years) was slightly higher than the hospital-bed study population (80 years), and 100% of the transition-bed patients were from the St. John's region.

Clinical characteristics were available on all transition-bed patients. There were significant differences between the transition-bed patient populations in each study period regarding those who were not declared as alternate level of care, and those with care levels less than Level 3. Most transition-bed patients were cognitively well. The literature identified impaired mental state as one of the determinants of long stay patients (Hilder et al., 1998; DeCoster and Kozyrskyj, 2000; Markson et al., 1983). This is inconsistent with the current study findings and, as previously reported; the mean length of stay of cognitively well patients was longer at each site in both study periods. This study finding

is similar to Shapiro et al. (1992); patients' medical characteristics, including cognitive impairment, had minimal impact on length of stay. This study did not consider the potential impact of cognition on the patients' choice of nursing home. A future examination of this variable, from the perspectives of the patients/families and the admitting practices of nursing homes, might be useful as identified by Markson et al. (1983); Shapiro et al. (1992) and DeCoster and Kozyrskyj (2000).

5.2.2 Appropriateness of Admission

Generally, between study periods, there was good compliance with all admission criteria at both transition-bed sites. There was, however, consistently better compliance at the Hoyles-Escasoni Complex site compared to the Leonard A. Miller Center site (see Tables 4.13, 4.14). As for differences between study periods for patients who were not declared alternate level of care, this study suggests that these may be the same patients for whom no hospital data were available, and for whom hospital health records personnel suggested had lengths of stay less than the 30 day period identified by the study inclusion criteria (see Section 3.4). This study's finding, that hospitalized seniors with lengths of stay less than 30 days were admitted into transition-beds, questions the appropriateness of admission of these patients into those beds that were designed to reduce the hospital length of stay for alternate level of care seniors. For the transition-bed patients who were less than Level 3 Care, and those who had not applied for long-term placement in St. John's, this study suggests that both these patient groups had the potential to prolong the transition-bed length of stay by being inappropriate for

immediate placement into long-term care.

5.2.3 Utilization of Transition-Beds

The majority of patients exited the transition beds within the anticipated time frame of three months (90 days). Also, the mean length of stay of cognitively well patients was longer than the mean length of stay for the total transition-bed population (Section 4.3.4.1). Upon separation from transition beds, the highest percentage of patients received their preferred long-term care placement option. Of note was the high number of patients from the Hoyles-Escasoni Complex site who accepted the first available bed. Generally, the first available long-term care beds in the St. John's Nursing Home system occur at the Hoyles-Escasoni Complex because this facility is not often listed among the top three choices by applicants (Beverly Vincent, Placement Coordinator, Health and Community Services St. John's Region, St. John's: personal communication, May 2003). There was such a high degree of patient and family satisfaction with the transition-bed program at the Hoyles-Escasoni Complex that most patients accepted a permanent bed in that facility when it was offered (Kathy Taylor Rogers, Manager, Transition Bed Program, Hoyles-Escasoni Complex, St. John's; personal communication, May, 2003). This changed perception regarding one of the long-term care facilities in the region was a positive outcome for the transition-bed program.

5.2.4 Summary: Transition-Bed Program Process Evaluation

A variety of patient and transition-bed program characteristics were examined to determine whether the transition-bed program provided appropriate, temporary, alternate level of care for hospitalized seniors. Regarding the clinical characteristics of the transition-bed patients, between study periods, there were differences in the number of patients who were not declared as alternate level of care, and with care levels less than Level 3. Also, regarding transition-bed patients' match with specific admission criteria, with the exception of fewer Leonard A. Miller patients who had not applied for long-term care placement in the St. John's region, there was good compliance with the remaining admission criteria suggesting that the transition-bed patients were generally appropriate for admission into the program. When the utilization of the transition-beds was examined, the mean length of stay by transition-bed patients was generally within the 90 day time frame suggested by administrators, and there was no evidence that patients remained longer in transition-beds awaiting transfer to their nursing home of choice.

This study's findings indicate that the transition-bed program did provide appropriate, temporary, alternate level of care for hospitalized seniors. However, there is no indication that the transition-bed program had a sustained impact on the hospital length of stay by alternate level of care seniors. Specifically, the lengths of stay by alternate level of care seniors decreased in the second study period (corresponding with the baseline transition-bed period), and increased in the third study period. This study suggests that health system administrators continuously monitor the appropriateness of patients that transfer into the transition-beds regarding the admission criteria to ensure the

transition-bed program provides temporary, alternate level of care services.

Although this study considered the appropriateness of admissions relating to the alternate level of care status of the transition-bed patients, it did not identify if these patients were the ones with the longest lengths of hospital stay. Alternate level of care seniors with the longest lengths of hospital stay should be given priority for transfer into transition-beds to maximize the efficiency of the acute care resources and promote the appropriate care requirements for these seniors.

5.3 Limitations

This study was conducted during a period of relative instability in the health care system in the St. John's region following a labor dispute by registered nurses that resulted in them being legislated back to work. One of the outcomes of this situation was that fewer nurses were available for hospital and nursing home schedules while employers processed the required conversions of casual nursing positions to permanent status. Acknowledging the increased demands on the system for appropriate nurse to patient resource requirements in both acute and long-term care sectors during that time, the transition-bed program provided a different professional staffing level. Specifically, higher ratios of licensed practical nurses to registered nurses staffed the transition-bed sites. Though beyond the scope of this study, future studies might consider whether the transition-bed staffing skill mix was appropriate for the care requirements of the patients, and sustainable as a cost-effective alternative to acute care resources.

The literature identified that there are financial implications for seniors who

accept nursing home placement (Shapiro et al., 1980; Markson et al., 1983; Gillick, 1989). As previously reported, one of the features of the transition-bed program was that alternate level of care seniors would continue to be charged the medical discharge accommodation rate in accordance with provincial requirements. This study did not examine how compliant alternate level of care seniors were with this financial implication of remaining in hospital or to access transition-beds. Also beyond the scope of this study were any analyses of patient or health system costs associated with extended hospital stays by seniors, their temporary placement in transition-beds, or their return home with required home supports.

The literature identified that inefficiencies within the health system contribute to delays in the placement of hospitalized seniors to nursing homes (Shapiro et al., 1980; Markson et al., 1983; Shapiro et al., 1992; DeCoster and Kozyrskyj, 2000). These researchers suggest a variety of factors including: the unavailability of publicly insured home support services; placement practices of the assessment and placement agencies that favor placing community emergencies over hospital patients; and the control nursing homes have to refuse to admit some eligible patients. While this study identified the mandates, roles and processes of the respective Health Boards regarding the assessment and placement of seniors for long-term care, it did not examine any potential inter-system efficiencies. As such, it is not possible to determine what secular trends may have confounded this study's finding that, over the study interval, fewer alternate level of care seniors were discharged to chronic care facilities. For example, it would be important to identify if there were any corresponding changes in admission practices by the long-term

care sector; or changes in the number of long-term care vacancies (due to prolonged lengths of stay in nursing homes or any reduction in the number of overall long-term care beds); or other system changes such as home support practices.

As identified, the electronic patient information systems employed by the Health Care Corporation of St. John's during this study interval did not capture the proportion of patients that were discharged to home. This is an important limitation to assessing the processes of in-hospital care, for example whether the alternate level of care stay achieved its rehabilitation potential. Also, important information regarding health system efficiencies is unavailable because the information systems did not specify the acute care facility to which the hospital seniors were discharged.

Chapter 6.0 Conclusion

This study evaluated an intervention introduced in the summer of 1999 to address the issue of alternate level of care seniors occupying acute care beds in the St. John's region. The intervention, a transition-bed program, was a collaborative effort among the provincial Department of Health and Community Services and its agents: the Health Care Corporation of St. John's; the St. John's Nursing Home Board; and Health and Community Services St. John's Region. Thirty beds from within existing regional chronic care and long-term care resources were identified. The main intent of the transition-bed program was to reduce the hospital length of stay by alternate level of care seniors by providing appropriate, transitional, residential care for those patients while they waited for permanent long-term care placement. This study was the first formal evaluation of this regional health system intervention.

The study used a retrospective observational pre/post design to assess the effectiveness of the transition-bed program. There were two main components of this thesis: 1) an outcome evaluation of the impact of the transition-bed program on the hospital length of stay by alternate level of care seniors and 2) a process evaluation of the transition-bed program to provide appropriate, temporary alternate level of care for hospitalized seniors.

Three study periods were selected for the hospital-bed evaluation:
1) Baseline: January 1, 1999 to June 30, 1999, a six month interval prior to the introduction of the transition-bed program; 2) Post intervention 1: January 1, 2000 to June 30, 2000, a six month interval within one calendar year after the establishment of

the transition beds; and 3) Post intervention 2: January 1, 2002 to June 30, 2002, a six month interval within two calendar years of the establishment of the transition beds.

Two study periods were selected for the transition-bed evaluation: 1) Baseline: January 1 to June 30, 2000, a six month interval within one calendar year of the introduction of the transition-bed program; and 2) Post intervention 1: January 1 to June 30, 2002, a six month interval within two calendar years of the establishment of the transition beds.

The hospital outcome evaluation component of the study examined a variety of patient and health system characteristics that affect the hospital length of stay by alternate level of care seniors in each of three study periods. There were two main findings concerning the hospital outcome evaluation. First, as a main effect, the length of stay and number of alternate level of care days were significantly shorter in the second study period (early in the transition-bed program). Other analyses of alternate level of care days, for clinical characteristics (most responsible diagnoses) and types of institutions at hospital separation, had similar findings. Specifically, hospital stays were shorter during a period early in the transition-bed program. As a preliminary finding, it appeared that the transition-bed program was successful at reducing the hospital lengths of stay. However, the analyses for the third study period concluded that these reduced lengths of stay were not sustained.

Second, there were unexpected findings regarding the types of institutions to which patients transferred at hospital separation. As previously discussed, the majority of patients transferred to chronic care facilities; this finding was not supported by the

literature (DeCoster and Kozyrskyj, 2000) and the information provided by Elliott (2002)) which identified that most patients return home. There was also an unexpected finding regarding a significant increase in the number of transfers to acute care facilities in the second and third periods. Though attributable to a small number of patients, this study suggests that the criteria used to determine alternate level of care patients is not standardized among acute care facilities in the province.

The second component of the thesis was a process evaluation of the transition-bed program to provide appropriate, temporary alternate level of care for hospitalized seniors in two study periods. This process evaluation examined the transition-bed patient and program characteristics regarding the appropriateness of admission into the transition-bed program, and the utilization of the transition beds.

Generally there was good compliance with the admission criteria, and the mean length of stay for the transition beds was within the length of stay anticipated by health system administrators. However, there were two unexpected findings. Contrary to the literature, cognitive impairment was not a barrier to the efficient placement of seniors. Specifically, the mean length of stay for cognitively impaired transition-bed patients was less than the mean length of stay for the patients as a whole. Also different from the literature were the findings regarding the impact of choice of placement on length of stay. Though not significant, the mean length of stay was higher for patients at the Hoyles-Escasoni Complex, compared to the Miller Center patients however, the majority of the Hoyles-Escasoni patients received their third choice or accepted the first available bed. This outcome was attributable to the positive experience of patients and families with that

facility which historically was rarely selected as a priority choice for permanent placement.

Findings from this study suggest that the transition-bed program, as a single approach to the issue of hospital length of stay of seniors, had no lasting effect. The literature identifies a variety of issues that impact length of hospital stay by seniors, including demographic, clinical and administrative characteristics. This study suggests that future studies utilize a multi-variate analysis to examine the issue of long stays by seniors in acute care beds, with a particular focus on the policies and practices of the other service providers involved in the continuum of services to this population. The issue of extended length of stay of seniors in acute care beds must be considered from a health systems perspective.

Shapiro et al. (1980, 1992) identified health system policy recommendations to address the impact of hospitalized seniors on acute care resources. Specifically, seniors should be required to accept the first available nursing home bed until the home of their choice becomes available. A similar "first available bed policy" of the provincial Department of Health and Community Services was under review during the time of this study however it had not been implemented at the conclusion of this study.

The results from this study are inconclusive to recommend the generalizability of the current St. John's regional transition-bed program as a viable method to address the issue of increased hospital length of stay by alternate level of care seniors.

Chapter 7.0 Recommendations

7.1 Administrative Support Mechanisms

This study suggests that health system efficiencies in the St. John's region could be improved with integrated patient information systems. Singular, stand alone patient information systems such as the 3M Health Information System, introduced by the Health Care Corporation of St. John's in 2000, can support the internal analyses of the respective organizations. However, because there is no integration among the patient information systems of the other health sectors, no regular monitoring or review of system efficiencies is possible. For example, regional decision makers are not able to electronically examine and monitor referral times between the hospital and the single entry system (managed by Health and Community Services St. John's Region) and the time required for processing placement requests for transition beds and other long-term care sector services, jointly determined by Health and Community Services St. John's Region and the St. John's Nursing Home Board. Additionally, integrated information systems would support regional strategic planning efforts regarding the appropriation of resources within the continuum of programs and services required to address the care requirements of seniors.

St. John's regional health system administrators should also collaborate regarding standardized policies and practices that enhance patient care and system efficiencies such as implementing standardized assessments for alternate level of care patients and transfer policies to other acute care facilities.

7.2 Future Research

Provincial and regional health system planners should ensure that future studies on the utilization and service requirements include detailed analyses of the age, sex and residence trends of seniors given that seniors are expected to comprise 13.5% of the provincial population by the year 2006 and 26% by the year 2026 (Newfoundland and Labrador Center for Health Information, 2003). For the St. John's region, population projections estimate that the population of seniors aged ≥ 75 years will increase by 18% in 2011 from 2000 (McDonald and Parfrey, 2001).

Administrators of the Health Care Corporation of St. John's should consider the current study findings, regarding the proportion of patients from outside the St. John's region, to assist with future interventions to reduce the length of stay by seniors awaiting long-term care placement. Administrators should consider if this proportion of local to "out of region" patients is acceptable and consistent with its mandate as a provincial tertiary care facility. Administrators should also consider this study's finding, that there is inconsistency with the literature regarding the overall percentage of seniors who do not return home upon separation from hospital, to determine if there is an appropriate range of post-acute care options for seniors including appropriately resourced home care/home support services.

Regional health system administrators should consider the issue of long hospital stays by seniors from a systems perspective recognizing that a change in one part of the system, requires the corresponding supportive practices of the other providers involved in the continuum of services to this population. Though beyond the scope of this study,

which focused exclusively on the availability of transition beds to reduce hospital length of stay, it is essential that future studies utilize multi-variate analyses to examine the variety of issues that impact the seniors' length of stay in acute care settings. For example, an examination of the admission practices of the St. John's Nursing Home Board and an evaluation of the utilization of community support services (with comparative cost analyses of these programs and services) during the same time periods, would provide the required additional information to fully analyze this regional policy decision and identify opportunities for further system integration and management efficiencies.

References

Applied Management Consultants. (2001). *Role and Feasibility Study for the St. John's Nursing Home Board.* St. John's Nursing Home Board: St. John's, Newfoundland and Labrador.

Bergal, T., Utilization Director, Winnipeg Regional Health Authority. Personal communication, Winnipeg, Manitoba, February 2004.

Brymer, C.D., Kohm, C.A., Naglie, G., Shekter-Wolfson, L., Zorzitto, M.L., O'Rourke, K., Kirkland, J.L. (1995). Do geriatric programs decrease long-term use of acute care beds? *Journal of American Geriatrics Society, 43,* 885-889.

Canadian Policy Research Networks Inc. (2001). *An analysis of blockage to the effective transfer of clients from acute care to home care, Sub-study 15,* 1-5.

DeCoster, C., Kozyrskyj, A. (2000). *Long-stay patients in Winnipeg acute care hospitals.* Manitoba Center for Health Policy, Winnipeg. Available online: http://www.umanitoba.ca/centers/mchp/reports/_97-00/lstay.htm.

DeCoster, C., Peterson, S., Carriere, K.C., Kasian, P. (1999). Assessing the extent to which hospitals are used for acute care purposes. *Medical Care 37(6 Supplementary),* 151-166.

Dwyer, J., Jackson,T. (2001). *Literature Review: integrated bed and patient management.* LaTrobe University, Faculty of Health Sciences, Melbourne, Australia.

Elliott, P., Vice President Planning and Quality, Health Care Corporation St. John's. Personal communication, St. John's Newfoundland and Labrador, May 2002.

Flintoft, V.F., Williams, J.I., Williams, R.C., Basinski, A., Blackstein-Hirsch, P., Naylor, C.D. (1998). The need for acute, subacute and nonacute care at 105 general hospital sites in Ontario. *Canadian Medical Association Journal 158,* 1289-1296.

Gillick, M.R. (1989). Long-term care options for the frail elderly. *Journal of American Geriatrics Society 37,* 1198-1203.

Glass, R.I., Mulvihill, M.N., Smith, H., Peto, R., Bucheister, D., Stoll, B.J. (1997). The 4 Score: an index for predicting a patient's non-medical hospital days. *American Journal of Public Health, 67,* 751-755.

Goodard, M., McDonagh, M., Smith, D. (1999). *Acute Hospital Care: Final Report.* York Center for Health Economics, in Dwyer, J., & Jackson, T., (2001). *Literature review: integrated bed management,* LaTrobe University, Faculty of Health Sciences, Melbourne, Australia.

Government of Newfoundland and Labrador. (2001). *Reaching Consensus and Planning Ahead: Provincial Profile: Health and Community Services,* Department of Health and Community Services. St.John's, Newfoundland and Labrador.

Harris, J. K., Finucane, P. M., Healey, D. C., Bakarich, A. C. (1997). Use of inpatient hospital services by people aged 90-99 years. *Medical Journal of Australia 167 (8),* 417-420.

Health Care Corporation St. John's Update. (July 28, 1999). *Transition bed program launched for medically discharged patients. (Phamplet).* Health Care Corporation St. John's, St. John's, Newfoundland and Labrador.

Hilder, P., Kirk, R., Bidwell, S., Weir, R., Cook, L., Tolan, C. (1998). Acute medical admissions: a critical appraisal of the literature. *New Zealand Health Technology Assessment, Report 6.* Christchurch, New Zealand.

Lambert, M., Arblaster, L. (1999). *Factors associated with acute use of hospital beds by older people: a systematic review of the literature,* in Dwyer, J., & Jackson, T., (2000). *Literature review: integrated bed management,* LaTrobe University, Melbourne, Australia.

LeBourdais, E. (1991). "SWAT team" helps Victoria solve problems caused by geriatric "bedblockers". *Canadian Medical Association Journal 145 (11),* 1493-1495.

Markson, E.W., Knight Steel, M., Kane, E. (1983). Administratively necessary days: more than an administrative problem. *The Gerontologist 23(5),* 486-492.

McClaran, J., Tover-Berglas, R., Glass, K.C. (1991). Chronic status patients in a university hospital: bed-day utilization and length of stay. *Canadian Medical Association Journal 145(10),* 1259-1265.

McDonagh, M.S., Smith, D.H., Goddard, M. (2000). Measuring appropriate use of acute beds: a systematic review of methods and results. *Health Policy 5(3),* 157-184.

McDonald, J., Parfrey, P. (2001). *The Needs for Long-term Institutional Care within the St. John's Region in 2001.* Memorial University, St. John's, Newfoundland and Labrador.

Menec, V.H., MacWilliam, L., Soodeen, R., Mitchell, L. (2002). *The health and health care use of Manitoba's seniors: have they changed over time?* Manitoba Center for

Health Policy, University of Manitoba, Winnipeg, Manitoba.

Newfoundland and Labrador Center for Health Information. (2003). *Seniors' Morbidity Report 1994-1999: Newfoundland and Labrador Health and Community Services and Integrated Health Boards.* St. John's, Newfoundland and Labrador.

Rosenfeld, L.S., Goldman, F., Kaprio, L.A. (1957). Reasons for prolonged hospital stay: a study of need for hospital care. *Journal of Chronic Disease 6(2),* 141-152.

Rubin, S.G., Davies, G.H. (1975). Bed blocking by elderly patients in general-hospital wards. *Age and Aging 4,* 142-147.

Shaughnessy, P.W., Schlenker, R.E., & Kramer, A.W. (1990). Quality of long-term care in nursing homes and swing bed hospitals. *Health Services Research 25(1),* 65-96.

Shapiro, E., Roos, N. P., Kavanagh, S. (1980). Long term patients in acute care beds: is there a cure? *The Gerontologist, 20 (3),* 342-349.

Shapiro, E., Tate, R. B., Tabisz, E. (1992). Waiting times for nursing-home placement: the impact of patients' choices. *Canadian Medical Association, 146 (8),* 1343-1348.

Taylor-Rogers, K., Manager, Transition-bed Program, Hoyles-Escasoni Complex, St. John's. Personal communication, St. John's, Newfoundland and Labrador, May 2003.

Tilley, G., Chief Executive Officer, Health Care Corporation St. John's, St. John's. Personal communication, St. John's, Newfoundland and Labrador, December 2003.

Vaughan, G., Assistant Executive Director, Health and Community Services St. John's Region, St. John's. Personal communication, St. John's, Newfoundland and Labrador, January 2003.

Vincent, B., Placement Coordinator, Health and Community Services St. John's Region, St. John's. Personal communication, St. John's, Newfoundland and Labrador, May 2003.

Appendix A
Data Elements and Sources

Data Elements	Hospital-Bed Patients		Transition-Bed Patients					
			HCSSJR		LAMC		HECx	
	Electronic	Paper	Electronic	Paper	Electronic	Paper	Electronic	Paper
Study ID		X		X		X		X
Patient #	X							
MCP #	X		X			X		X
Age	X							
Date of Birth	X							
Sex	X							
Residence	X							
MRD	X							
Length of Stay (LOS)	X					X		X
ALC Days	X							
Level of Care			X			X		X
Level of Cognition			X					
Date of Admission	X					X		X
Date of Discharge	X					X		X
Status Upon Discharge	X					X		X
Criteria: ALC			X					
Criteria: Med Stable			X					
Criteria: Applied St. John's				X				
Criteria: Level $\geq$ 3			X					
Criteria: In-pt" of HCC			X					
Exit: Chronic	X							
Exit: Acute	X							
Exit: Palliative	X							
Exit: 1st Choice				X				
Exit: 2nd Choice				X				
Exit: 3rd Choice				X				
Exit: 1st Available Bed				X				
Exit: Outside				X		X		X

Appendix B TEMPLATE A

Data Elements Transition Bed Patients: LAMC, HECx Health Records

Site: _____

Period: _____

Elements:

Study ID _____

MCP # ----------

Date of Admission _____

L of Care _____

Date of Discharge _____

Length of Stay _____

Status upon Discharge:

- Died _____
- Discharged St. John's _____
- Discharged outside St. John's region _____
- Other _____

Appendix C TEMPLATE B

Data Elements Transition-Bed Patients: Single Entry Health Records

Site: _____

Period: _____

Elements:

Study ID _____

MCP # _____

Date Referred to Single Entry (HCC in-patient) _____

Applied for Placement St. John's _____

Level of Care _____

Level of Cognition _____

Declared ALC _____

Medically Stable _____

Choice of LTC Placement _____ _____

_____ _____

Status upon Discharge from Transition Bed:

- Died _____
- Exit 1st Choice _____
- Exit 2nd Choice _____
- Exit 3rd Choice _____
- Exit 1st Available _____-
- Exit outside St. John's Region _____

Appendix D

Data Variables, Definitions and Coding

Variable	Definition	Coding
Length of Stay (LOS)	Total length of stay (hospital, transition beds)	Days
Site	Location of transition bed facility	1 - LAMC 2 - HECx
Era	Selected study intervals: January 1 to June 30	Era 1, 1999 Era 2, 2000 Era 3, 2002
Age	Age at hospital admission	Years
Sex	Patient's sex	0 – M 1 - F
Place of Residence	Community of primary residence	1 - St. John's Region 0- Outside Region
MRD	Most responsible diagnosis as recorded at hospital admission	1-Fractures 2-CVD 3-CHD 4- Malignant. Neoplasms 5- Pneumonia 6- Dimentia 7-Other
Level of Care	Level of care, per Continuing Care Adult Long Term Care assessment instrument (CCALTC)	1- L1 2- L2 3 - L3 4 - L4
Level of Cognition	Cognitive level per CCALTC	0 – Cognitively well 1- Cognitively impaired
ALC Days	Number of days in acute beds as alternate level of care patient	Days
Hospital Discharage Status	Per hospital separation data: 1) Exit code 2) Discharge destination	0 - Died 1 Exit alive 1- Chronic 2- Acute 3- Palliative
Transition bed Discharge Status	Per transition bed separation data	0 - Died 1 – 1st choice 2 – 2nd choice 3– 3rd choice 4- 1st available 5- Outside region 6-Other
Transition bed admission criteria	Match with individual eligibility criteria for admission to transition beds	1-ALC 2- Medically. Stable 3-Applied LTC St. John's 4-Care Level ≥3 5- In-patient HCC

Appendix G

THE NEWFOUNDLAND APPROPRIATENESS HOSPITALIZATION STUDY CRITERIA - BASED ON THE APPROPRIATENESS EVALUATION PROTOCOL (AEP) RESTUCCIA AND PAYNE 1987

CRITERIA OF APPROPRIATENESS OF ADMISSION

A. Severity of illness criteria
   1. Sudden onset of unconsciousness or disorientation (coma or unresponsiveness)
   2. Pulse rate
      a. < 50 beats per minute
      b. > 140 beats per minute
   3. Blood pressure
      a. systolic < 90 mm Hg or > 200 mm Hg
      b. diastolic < 60 mm Hg or > 120 mm Hg
   4. Acute loss of sight or hearing
   5. Acute loss of ability to move body part
   6. Persistent fever ≥ than 37.8°C (oral) or >38.6°C (rectal) for more than five days
   7. Active bleeding
   8. Severe electrolyte or blood gas abnormality (any of the following):
      a. Na < 123 mEq/L
         Na > 156 mEq/L
      b. K < 2.5 mEq/L
         K > 6.0 mEq/L
      c. Total CO_2 (Bicarbonate) (unless chronically abnormal) < 20 mEq/L
         Total CO_2 (Bicarbonate) (unless chronically abnormal) > 36 mEq/L
      d. arterial pH < 7.30
         arterial pH > 7.45
   9. ECG evidence of acute ischemia; suspicion of a new myocardial infarction
   10. Wound dehiscence or evisceration

B. Intensity of service
   1. Intravenous medications and/or fluid replacement (does not include tube feedings)
   2. Surgery or procedure, not suitable for PAC, scheduled within 24 hours requiring
      a. general or regional anesthesia, or
      b. use of equipment, facilities, or procedure available only in a hospital
   3. Vital sign monitoring every two hours or more often (may include telemetry or bedside cardiac monitor)
   4. Chemotherapeutic agents that require continuous observation for life-threatening toxic reaction.
   5. Treatment in an intensive care unit
   6. Intramuscular antibiotics at least every eight hours
   7. Intermittent or continuous respirator use at least every eight hours

Appendix G

CRITERIA OF APPROPRIATENESS OF DAY OF CARE

A. Medical Services
1. Procedure in operating room that day
2. Procedure in operating room scheduled the next day, requiring preoperative consultation or evaluation (not suitable for PAC)
3. Cardiac catheterization that day
4. Angiography that day
5. Biopsy of internal organ that day
6. Thoracentesis or paracentesis that day
7. Invasive central nervous system diagnostic procedure (e.g. lumbar puncture, cisternal tap, ventricular tap) that day
8. Any test requiring strict dietary control, for the duration of the diet
9. New or experimental treatment requiring frequent dose adjustments under direct medical supervision
10. Close medical monitoring by a physician at least three times daily (observations must be documented in record)

B. Nursing/life support services
1. Respiratory care - intermittent or continuous respirator use and/or inhalation therapy (with chest physical therapy, intermittent positive pressure breathing) at least three times daily.
2. Parenteral therapy - intermittent or continuous intravenous fluid with any supplementation (electrolytes, protein, medications)
3. Intramuscular and/or subcutaneous injections at least twice daily, if unsuitable for Home Care.
4. Intake and output measurement
5. Major surgical wound and drainage care (e.g. chest tubes, T-tubes, hemovacs, Penrose drains)
6. Close medical monitoring including vital signs, by nurse at least three times daily, under physician's orders

C. Patient condition
1. Within 24 hours on day or before day of review: inability to void (past 24 hours) not attributable to neurological disorder
2. Within 48 hours of review:
   a. transfusion due to blood loss
   b. ventricular fibrillation or ECG evidence of acute ischemic, as stated in progress note or in ECG report
   c. fever at least 38.3°C rectally (at least 37.8°C orally), if patient was admitted for reason other than fever
   d. coma - unresponsiveness for at least one hour
   e. acute confusional state, not due to alcohol withdrawal
   f. acute hematologic disorders, significant neutropenia, anemia, thrombocytopenia, leukocytosis, erythrocytosis, or thrombocytosis, yielding signs or symptoms
   g. progressive acute neurological difficulties
3. a. Within 10 days before day of review for complicated MI
   b. Within 6 days before day of review for uncomplicated MI
   c. Within 7 days before day of review for acute stroke
4. Within 24 hours - requires assessment/treatment by Physio/OT/other which cannot currently be appropriately provided outside an acute care institution

Appendix G

REASONS FOR POTENTIALLY AVOIDABLE DAY OF STAY

1. Awaiting Surgery
   a) Premature admission - or date booked, but patient admitted more than 24 hours prior to surgery.
   b) Delay in scheduling > 24 hours from time ordered.
   c) Scheduled for surgery, 'bumped' because of emergency.
   d) Delay in surgery due to "40-hour week" problem.
   e) Elective surgery - Specific procedure should have been admitted through same day admission clinic.
   f) Delay due to equipment failure.
   g) Delay because of indecisiveness of patient/family
   h) Other

2. Awaiting diagnostic test or non-operating room procedure
   a) Premature admission for a test or procedure (greater than 1 day).
   b) Admitted day before diagnostic test/procedure or B should have been admitted same day as above (ie. angiography, chemotherapy)
   c) Booked for that day, cancelled and rescheduled
   d) Ordered, but >24 hours awaiting for procedure to be done
   e) Delay due to "40-hour week" problem
   f) Diagnostic procedure could have been done as outpatient procedure.
   g) Indecisiveness of patient (or family) regarding a procedure.
   h) Other

3. Awaiting Consultation
   a) Awaiting > 24 hours for assessment by consulting physician
   b) Other

4. Awaiting Results
   a) Awaiting > 24 hours for results of tests, biopsy etc.
   b) Other

5. Medical Management
   a) No documented plan for active treatment or evaluation of patient
   b) Inadequate preadmission assessment, causing delay in completing procedure/treatment
   c) Inefficient test sequence after admission causing delay in diagnosis and/or treatment.
   d) Overly conservative treatment ie. (nothing much done for three day observation)
   e) Other

6. Delays relating to the Discharge process
   a) Delay in initiating timely discharge plan (ie. sending appropriate consults to Long Term Care).
   b) Delay discharge home - overly conservative medical management; no services required.
   c) Patients discharged/transfer delayed because of late time of physician writing discharge orders.
   d) Delay discharge to hostel or local accommodations for remainder of diagnostics/treatments (procedures, treatments did not require hospitalization)
   e) Delay discharge because appropriate alternative facility is not available (specify).
      - Long Term Care - is not available (specify)
      - Convalescence/~~rehab~~ Rehab
      - Palliative/Supportive
      - ~~Extended skilled nursing facility care.~~
      - Seniors Care Program
   f) Discharge delayed because of unavailability of alternative non-facility based treatment ie. - home health care services (Specify)
   g) Patient from unhealthy environment - pt. kept until environment becomes acceptable or alternative facility found.
   h) Delay discharge because patient/family not in agreement with plan
   i) Patient/family rejection of available space at appropriate alternative facility.
   j) Other

Appendix H

Medical Care Map

Name:

MCP#:

Chart #:

Date of Admission: _____

Attending Physician: _____

Admission Diagnosis: _____

Comorbidities:

Codes: LOS - Length of Stay EDD - Expected Date of Discharge
ELOS - Expected Length of Stay PLOS - Predicted Length of Stay

1.	3.	5.
2.	4.	6.

Predicted LOS: _____ **Target LOS:** _____ **EDD:** _____

Key investigations, therapies, interventions and consults:

Admission Day 1	Day 2 & 3	Day 4 & 5
Day 6 & 7	Day 8 & 9	Day 10 & 11

Reason for continued stay:	Reason (indicate #)	Reason (indicate #)
1. Unstable 2. Awaiting test 3. Awaiting results 4. Awaiting consult 5. IV therapy 6. ALC 7. Awaiting transportation 8. New diagnosis 9. Other **(please specify)**	Day ____ _____ Day ____ _____ Day ____ _____ Day ____ _____	Day ____ _____ Day ____ _____ Day ____ _____ Day ____ _____

Revised Diagnosis: _____

Post Admit Comorbidities:

1.	2.	3.

Revised PLOS: _____ **Revised Target LOS:** _____ **Updated EDD:** _____

Actual LOS: _____ **Discharge Date:** _____

Please return form to: P. King Jesso - Manager for Discharge Planning, Room 1273 General Site

ch-0297 2002/01