

FACTORS THAT INFLUENCE MEDICARE PART A BENEFICIARIES' LENGTH
OF STAY IN THE NURSING HOME, AFTER A HOSPITALIZATION

by

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ABSTRACT

The purpose of this study was to begin testing of a downward cross-level model for studying the ability of older adults to transition from a nursing home after a Medicare Part A reimbursed stay. Transitions are known to be a weak point in the provision of healthcare to older adults and thus far, research has not identified those factors that influence older adult's transitions i.e., from the nursing home after a post acute stay.

The theoretical background for this study was supported by Resource Dependency Theory which is a theory that contends that organizations are externally controlled by activities outside the organization such as the "free-market" economic model that predominates the nursing home industry. It was thought that nursing homes may prioritize their need for resident census above the resident's need for discharge. The hypothesis was that both individual resident characteristics and organizational characteristics might influence the ability of older adults to transfer from the nursing home after a Medicare Part A stay.

The method of analysis in this study was contextual regression. Individual and facility characteristics were the independent variables and length of stay was the dependent variable. For this project, emphasis was placed on the development of a methodology for using the MDS in this and future research studies. Selection of variables and methods for variable computation were highlighted. Individual and facility characteristics and discharge disposition (level of care) were reported descriptively. Although facility characteristics did not contribute significantly to the model, individual characteristics explained 28% of the variance in the length of stay. Fifteen percent of

individuals in the sample died during their Medicare Part A stay and 18% were readmitted to the hospital. The most prevalent diagnoses of the sample were hypertension (35%), falls (34%) and arthritis (32%).

Findings suggest that individual characteristics account for only a portion of the length of stay for post acute nursing home residents. Further model testing is needed and should include a larger facility sample size and market characteristics to determine if those factors significantly influence the ability of older adults to transfer after the Medicare Part A stay ends.

CHAPTER ONE BACKGROUND AND SIGNIFICANCE

Introduction

The number of nursing home residents 65 years of age and over has been increasing because of the rapid growth in the older population. The older population (age 65 years and over) was 35.9 million in 2003, or one in every eight Americans (Federal Interagency, 2004). Currently, 4.5% of all adults older than 65 years live in nursing homes. Among the oldest of old, (85 years and over) approximately 18% of those live in nursing homes. The population is expected to grow so that by 2020, 54.6 million Americans will be over age 85 (US census, 2000) and 9.8 million people will require nursing home care.

In today's United States market-oriented health care system, older adults may receive healthcare services in hospitals as well as in less expensive community-based settings such as nursing homes, primary care providers' offices, and at home using services of home health care organizations and families. Nursing homes that provide post acute care under the Medicare Part A program are termed, "skilled nursing facilities". Community-based health care services for older adults (also referred to as long term care) also occur in a range of congregate residences such as Assisted Living, Alzheimer's care and Hospice care. Each residence generally offers some type of chronic disease management or care by a licensed nurse (Senior housingNet, 2006). Older adults with complex health related issues frequently require care from different health professionals

in multiple settings. It is at the transition points between these settings and providers of care where older adults with complex care needs are particularly vulnerable to poorly executed transitions (Coleman, 2003).

In a position statement issued by the American Geriatrics Society, transitional care is defined as a set of actions designed to ensure the coordination and continuity of health care as patients transfer between different locations or different levels of care within the same location (Coleman & Boult, 2003). Despite how common these transitions have become, initiatives for improving care transitions have received little attention from policy makers, researchers, clinicians, or quality improvement entities (Coleman, 2003). Investigating care transitions from the skilled nursing facility is a central concern of this study.

While policy makers assume the nature of transitions, e.g., to home, to assisted living facilities is determined by clinical factors such as the elder's health status and functional abilities, no research confirms that assumption. This research is designed to test that assumption by developing a methodology for exploring the affect of market and organizational factors on older adults' ability to transition out of nursing homes after rehabilitative stays.

Changes in health policy have impacted older adults' transitions within the health care system. Prior to 1980, when older adults became acutely ill, they were admitted to the hospital for treatment. In the hospital, they received care for their acute condition and received subsequent rehabilitation that would enable them to return to their prior residence or to receive end of life care if appropriate. At that time, nursing homes

provided mostly custodial nursing care which met the residents' basic day-to-day nursing care needs.

Beginning in the 1980s with Diagnostic Related Groups (DRGs) and subsequent legislation, Medicare beneficiaries had shorter hospital lengths of stay (Carey, 2000; Coulam & Gaumer, 1991). Shorter hospital stays raised the now familiar concern that patients were discharged sicker and quicker (Yip, Wilber & Myrtle, 2002). Many of these discharges were to skilled nursing facilities. As a result of shifts in hospital and SNF reimbursement, utilization and costs rose dramatically in the post-acute health care sector during the 1990s (Kane, Finch, Blewett, Burns, & Moskowitz, 1998). Subsequently, the Balanced Budget Act of 1997 (BBA) was passed that transformed SNF reimbursement into a prospective payment system (PPS).

Based on these changes in health policy, nursing homes began caring for more acutely ill individuals within their skilled nursing facilities (SNFs) and broadening their range of skilled services. Older adults began to transition from the hospital to the SNFs earlier during their spell of illness to receive one or more skilled nursing, physical, occupational, and speech therapy services. The goal of SNF care is to assist the client to be rehabilitated and to return to the community, although this is not always the outcome. Clients may return to the hospital, enter hospice or home health care, transition to custodial care in a nursing home, transfer to another nursing home, psychiatric facility, or die (CMS, 2000). Frijters, DuPaquier, Berg, Carpenter, & Ribbe (1997), found that over 45% of nursing home residents were discharged to a hospital within 180 days after their first nursing home admission. It has been noted that the needs of Medicare beneficiaries

who are discharged after an acute hospitalization are both complex (requiring care from different practitioners in multiple settings) and ongoing (lasting 30 days or more) (Coleman, Min, Chomiak & Kramer, 2004). The fact that the transitions older adults face after a hospitalization are poorly tracked and poorly understood, should be a key concern to policy makers

The Institute of Medicine (IOM) report in 2001 and the Academy of Health Services Research and Health Policy report clearly state that future research must address how financing systems, organizational structures and processes affect access, cost and quality of health care (IOM, 2001). The IOM also calls for greater integration of health care delivery across different settings to improve the quality of care transitions and reduce the threat of medical errors (IOM, 2001). However, current research has not thoroughly addressed these issues, and specifically has not addressed the factors that influence older adults' transition or failure to transition out of nursing homes after a rehabilitative stay.

Individual health, social, and financial factors are thought to influence the time older adults spend in nursing homes. Boockvar & Vladeck (2004) note that studies that target transitions should include the clinical and socioeconomic circumstances antecedent to patient relocation that influence relocation decisions and outcomes. The effect of organizational factors on nursing home resident clinical outcomes is often the focus of nursing home research. However, the body of nursing home research has not previously linked organizational factors with relocation outcomes. The impact of organizational factors on residents' discharge outcomes after a post acute stay in the nursing home was a

concern of this study.

In this study, an adapted conceptual model based on Resource Dependency Theory (RDT) is presented to illustrate how organizational and market factors may impact transitions in care venues. A basic tenant of Resource Dependency Theory is that forces in the environment external to the organization shape the organizational decision making. RDT holds that agents within organizations are motivated primarily by the market competition for scarce resources. Agents within organizations may engage in certain behaviors to secure scarce resources in order to protect the interests of the organization. Within nursing homes, managers acting to protect the nursing homes' best interests and the organizations best interest may take priority over other considerations, i.e., the interests of older adults living in the nursing home. These actions may results in recommendations that lead to older adults transitioning into custodial care in the same facility after a post acute stay, rather than being discharged to a lower level of care. The model suggests that nursing home characteristics and market factors may influence older adults' ability to transition out of the nursing home after a rehabilitative stay. A full discussion of the conceptual model and accompanying variable descriptions are presented in Chapter 2

Research studies that examine post-hospital care transitions should target the frequency and complexity of these transitions (Coleman, Min, Chomiak, & Kramer, 2004). The skilled nursing facility (SNF) stay and subsequent transition add to the complexity of illness or post hospitalization experience for older adults. Better understanding of the transitions (or lack thereof) will allow for the early identification of

evidenced-based systems interventions to improve the quality of transitions for older adults among a variety of settings (Naylor & Brooten, 1999; Philbin 1999). Identification of flaws in the current incentive structure that allows nursing homes to act contrary to an older adults' best interest also may be uncovered in this study leading to appropriate changes in health policy.

The purpose of this descriptive study is to identify those factors that influence the ability of older adults to transition out of the nursing home after a rehabilitative stay. Areas to be considered include individual demographics and health characteristics, and skilled nursing facility organizational characteristics. Market factors, important factors influencing nursing home practices will be part of the model development, but will not be measured in this study.

Statement of the Problem

This study will research how environmental factors influence individual health outcomes. This area of research is in the domain of nursing and it is relevant to the health of older adults who entrust their lives to nurses. Madelyn Leininger (2001) and Martha Rogers are nurse theorists who identified the inseparability of humans and their environment (Malinski, 2001). Previous studies in nursing systems science was focused on the effect of organizational factors as specific environmental factors that influence care outcomes. Organizational factors such as staffing, profitability status, and unit size in hospitals and nursing homes have been shown to influence various outcomes such as morbidity, mortality (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; McGillis-Hall, 2004) and quality as measured by state survey results (Harrington, Zimmerman, Karon,

Robinson, & Beutel, 2000, O'Neill, Harrington, Kitchener, & Saliba, 2003).

If organizational characteristics affect some individuals' quality outcomes; they may also influence older adults' transitions out of nursing homes after a rehabilitative stay. Several earlier studies have linked nursing home characteristics such as profitability status, size, level of vertical integration, level of horizontal integration (member of chain vs. free-standing), and per cent Medicare and Medicaid census (skill mix) with quality of care (Harrington et al, 2000; Harrington, Woolhandler, Mullan, Carrillo, & Himmelstein, 2001; O'Neil et al., 2003). Support for analyzing these facility characteristics will be presented later in this sub section.

Nursing homes do not exist in a vacuum, but rather are surrounded by a health care network that exists in a wider, market-driven (economy) community. Market factors in the external environment comprise the nursing home operating environment. Level of competition, reimbursement rates, and health policy are all environmental factors that impact nursing homes. In addition, nursing homes operate in a highly regulated environment that directly effects their business decisions. Therefore, an overview of the current incentive structure is offered to more fully understand the impact of the regulatory environment on nursing homes.

The statement of the problem begins with the background information about Medicare and Medicaid reimbursement and the Balanced Budget Act (BBA) and their impact on the current financial incentive structure within the nursing home industry. The financial incentive structure as interpreted by each nursing home underpins the theoretical model proposed for the study and is important with respect to what motivates

agents within nursing homes to make decisions that impact the ability of the older adult to transition to different levels of care and/or settings. The next part of this section provides a review of organizational level nursing home research, individual health characteristics, the process of transitions within the skilled nursing facilities, and outcomes. The statement of the problem section concludes with the study purpose, aim and hypotheses to be tested.

Medicare, Medicaid and Other Insurance

Medicare Part A and Medicaid are governmentally administered insurance programs designed to safeguard the health of older adults and disabled citizens. Medicare is primarily a federally-funded program, while Medicaid is funded by both state and federal money. Most nursing homes depend on both Medicare Part A and Medicaid and private pay sources for their revenue. Ninety percent of nursing homes participate in both the Medicare Part A and Medicaid certification processes which mean some of their resident census is receiving skilled nursing or rehabilitative services under Medicare Part A and some are receiving custodial services under Medicaid (Harrington et al, 2003). Detailed certification requirements can be found in the federal register (Centers for Medicare and Medicaid, 1999).

Most older adults participate in either the Medicare Part A or Medicaid programs or both. Others may carry private insurance or pay with their own funds. In 2002, 67% of nursing home residents had their stay paid by Medicaid, 10% by Medicare, and 22% paid privately (Harrington et al, 2003). Residents (older adults who dwell in SNFs) also may have more than one type of insurance, thus they may use various types of insurance

at different points during their nursing home stay. For example, a nursing home resident may receive custodial care under Medicaid and be living in a nursing home on a long term basis. If the resident has a hospitalization for an illness like a fractured hip, the resident would return to the nursing home to receive skilled nursing care temporarily under the Medicare Part A insurance. Eventually the resident would most likely resume custodial care under the Medicaid program within the same nursing home.

The reimbursement and participation rates among Medicare, Medicaid, and private pay insurance vary. Reimbursement rates influence skilled nursing facilities' revenue and depend upon the residents' payer source, the level of service provided, and that which is allowable under the policy. Reimbursement under the Medicare program is typically the highest. Medicaid reimbursement is typically 70-80% of Medicare Part A and self-pay reimbursement (Swan, DeWitt, & Harrington, 2000). Nursing homes have historically considered Medicaid reimbursement rates to be low and prefer private pay patients (Phillips & Hawes, 1988) although large, for-profit nursing homes usually have a high Medicaid census (Aaronson, Zinn, & Rosko, 1994).

The range of reimbursement rates among payer sources results in an incentive structure in which nursing homes compete for the best sources of revenue. Residents whose stay is reimbursed at a higher rate become a scarce resource and more preferred. Residents with higher paying insurance benefits represent more revenue for the nursing home and therefore nursing home managers may act in a manner to secure those resources. (Note: some reimbursement is better than empty beds from a business perspective.) Nursing homes with a higher percentage of Medicaid residents (lower

reimbursement levels) may be less likely to transition older adults out of their nursing home after a rehabilitative stay. This may occur even when it is not in the residents' best interest to remain in the nursing home where they received rehabilitative care.

Incentive Structures and the Balanced Budget Act

It is not the intent of this study to attempt to quantify the effects of federal health policy and the current incentive structure on nursing homes or their skilled nursing facilities. This study is not a pre/post BBA analysis. Acknowledging the impact of health policy and the resultant incentive structure that nursing homes operate under, however, is basic to understanding this application of Resource Dependency Theory. Resource Dependency Theory assumes that agents within organizations act in the organizations best interest to procure scarce resources in any way possible. This section will describe how current health policy creates an incentive structure where older adults with insurance with better reimbursement represent a scarce resource to the nursing home. The nursing homes therefore, may act to procure the scarce resources regardless of the consequences. Given the vulnerability of the population, whether or not nursing homes are influenced by factors other than the clients' best interest is an ethical concern. Examples of research studies completed after the Balanced Budget Act serve to illustrate the point that nursing homes consistently act to procure resources that are in their best interests regardless of the impact to the client.

The Balanced Budget Act of 1997 was passed by congress with the intention to contain the rapid growth of post-acute care expenditures. It targeted the nursing homes that provided skilled nursing care under the Medicare Part A insurance program (skilled

nursing facilities or SNFs). It mandated that SNFs and home health care agencies receiving payment under Medicare Part A, be converted from a cost-plus reimbursement to a prospective payment (PPS) based reimbursement system. Apprehensive that the PPS system would not provide sufficient reimbursement, skilled nursing facilities were reluctant to admit patients whose costs could exceed fixed reimbursements (Arling, Williams, & Kopp, 2000; Gage, 1999). In fact, both the Office of Inspector General (OIG, 1999) and General Accounting Office (GAO, 2000) reported that SNFs were likely to respond to PPS with several strategies including admitting residents requiring fewer resources and denying admission to residents requiring high intensity care. Later it was found that SNFs were more likely to admit residents needing rehabilitative care since the BBA actually improved the Medicare Part A reimbursement structure for skilled nursing facilities participating in the program (GAO, 2002). Reimbursement levels under PPS have undergone several revisions and PPS reimbursement is often a topic of debate between providers and policy makers.

Over the past 20 years in the health care industry, the trend has been that hospital stays are shorter (Carey, 2000). Transitional care units within hospitals have been all but eliminated in many geographical locations, putting the focus for rehabilitation on the SNFs. For example, in 1999-2001, approximately 75% of all Arizona nursing home residents were admitted post-hospitalization under Medicare payment (Lamb, Bursac, Bailey, Chapin, Alvine, 2004). Furthermore, in a cross sectional analysis of all Arizona nursing home residents at any given point from 1999 to 2001, 25% had been admitted from the hospital for rehabilitation (Lamb et al., 2004). These data suggest that agents

within skilled nursing facilities motivated to maximize revenues, were very welcoming to the Medicare A beneficiaries. The improved reimbursement structure eventually made older adults in the Medicare Part A program a very sought after revenue stream for the nursing home.

Research since the Balanced Budget Act has focused on patient access and nursing homes' admission practices, and the use of rehabilitation services (GAO, 2000; GAO, 2002; OIG, 1999; and Yip et al., 2002). In an extensive literature search, no studies could be found that identified discharge outcomes for skilled nursing facility residents. Instead of examining admission practices, this study will look at those factors that influence older adults' ability to transition out of nursing homes after a rehabilitative stay. Identifying those will help inform stakeholders and shape public health policy. Potentially, skilled nursing facilities could be held accountable to insure smooth transitions to the most appropriate level of care for the older adults, even if it requires losing some revenue. This would necessitate clinical and managerial staff in the nursing home be actively involved to develop best transition practices based primarily on the health, social, and economic needs of older adults, rather than on the facilities' need for revenue.

Nursing Home Organizational Characteristics

The next subsection is a literature review of nursing home organizational research. Certain nursing home organizational characteristics including profitability status have been shown to affect certain clinical outcomes such as pressure sores-a critical health outcome for older adults living in nursing homes. Previous research most

relevant to the development of the theoretical model is included.

Profitability Status

Profitability status relates to the goals of a nursing home and its reason for existence. Nursing homes can operate on either a for-profit, not-for-profit basis. The primary goal of for-profit nursing homes is to maximize shareholders' wealth (Harrington et al., 2001). Not-for-profit nursing homes typically have a more service-oriented mission with connection to a church group or governmental agency. Unmeasured differences such as organizational philosophy, and skill and training of staff may contribute to some of the differences seen between for-profit and not-for-profit nursing homes (Harrington, Zimmerman, Karon, Robinson & Buetel, 2000).

States report that between 40%-77% of nursing homes operate on a for-profit basis, with the national average of 65.5% of nursing homes operating on a for-profit basis (Harrington, et al., 2003). Not-for-profit nursing homes make up 28.3% of the national market share with 6.2% being governmentally owned. Several studies point to distinct differences in operating practices between for-profit and not-for profit nursing homes that have a direct affect on resident outcomes (Aaronson, Zinn, & Rosko, 1994; Spector, Selden, & Cohen, 1998; Harrington, et al, 2000). Differences in quality and staffing between the two are described in the next two sub sections.

Quality of Care

Quality of care, as measured by the number of state survey deficiencies, is diminished among for-profit nursing homes in comparison to not-for-profit nursing homes (O'Neill, Harrington, Kitchener, & Saliba, 2003). Total deficiencies at for-profit

facilities averaged 5.89 per home, 46.5% higher than at nonprofit facilities and 43% higher than at public facilities. Rates of severe deficiencies at for-profit facilities averaged 40.5% higher than at nonprofit homes and 35.8% higher than at public homes (Harrington, Woolhandler, Mullan, Carrillo, & Himmelstein, 2001). This is significant because state surveys are thought to be a reliable indicator of nursing home performance (CMS, 2006). Differences between for-profit and not-for-profit nursing homes on quality measures may be indicative of differences in their mission, goals, and subsequent behavior. For-profit nursing homes that focus on profits may be less likely to insure appropriate transitions for older adults' after their rehabilitative stay.

Staffing

Staffing levels are important because fewer staff is directly related to poorer quality of resident care (Harrington, Zimmerman, Karon, Robinson Buetel, 2000). The number of hands-on nursing staff is fewer in for-profit nursing homes in comparison to not-for-profit homes for each occupational category (Aaronson et al., 1994, Harrington, et al., 2001). Adverse resident outcomes i.e., pressure sores, are more likely to occur in for-profit nursing homes even when risk factors for pressure sores are considered (Aaronson). For-profit nursing homes are associated with lower Registered Nurse (RN) and total nurse staffing hours (Harrington, et al.). The average number of nursing hours per resident per day in for-profit homes is 3.11, compared to 3.91 in not-for profit homes (O'Neill et al., 2003). Cohen and Spector (1996) found that a higher ratio of RNs to residents, adjusted for resident case mix, reduced the likelihood of death and that a higher ratio of LVN/LPNs (Licensed Vocational/Practical Nurse) to residents significantly

improved resident functional outcomes. Cherry (1991) found that increased RN hours were positively associated with improved resident outcomes. For-profit nursing homes practice of reducing staffing is related to their core mission of profitability and raises the question of whether profitability may be a factor that influences older adults' ability to transition out of nursing homes after a rehabilitative stay.

The ubiquity and pattern of prioritizing profits when delivering care to vulnerable older adults have become an area of concern for researchers and the general public. Profitability status has been shown to be a significant factor affecting quality outcomes in numerous studies. Profitability status will be evaluated in this study as an organizational characteristic that may have an affect on the length of stay of older adults in skilled nursing facilities. Combining nursing home profitability status with the current incentive structure, i.e. reimbursement structures, could lead managers working within nursing homes to try to keep residents with better reimbursement within their facilities even if it is not in the residents' best interest.

Level of Vertical Integration

The degree to which an organization owns its upstream suppliers and downstream buyers is known as vertical integration (QuickMBA, 2006). In the nursing home industry, the impetus to become a vertically integrated campus is a business decision. Two considerations for vertical integration are cost and control.

Organizations typically vertically integrate when the cost of owning and operating that business unit is less than a market transaction to accomplish the same goal. For example, a skilled nursing facility may hire their own physical therapists to give

rehabilitative care to their residents, or may contract with physical therapy companies in the community to provide the care. If the cost to the facility to contract with therapy companies in the community exceeds the costs to the facility of hiring physical therapists as staff, then the facility would be best served to hire their own physical therapists instead of using an outside company. Hiring the therapists as staff is an example of vertical integration where the skilled nursing facility is controlling their upstream supply.

Facilities can also use vertical integration to control their downstream buyers. Facilities accomplish this through controlling access to resources. This can result in barriers into entry to other organizations and insure cooperation of buyers and other key players external to the organization. Organizations that are vertically integrated can control access to assets and succeed over other organizations that are not. Asset (resource) control is viewed as a major tenant of Resource Dependency Theory and an important consideration in the nursing home industry.

Continuum of care campuses are a form of vertical integration, in which one owner provides a range of services such as skilled nursing facilities, assisted living and independent retirement apartments on one campus (Senior HousingNet, 2006). Continuum of care campuses make it easier for the organization to transition older adults among various levels of care on their own campus while still maintaining their revenue stream. For example, an assisted living complex that also has a skilled nursing facility on that campus may act to prevent their residents in need of skilled services from going elsewhere for that service.

In an extensive review of the literature, few studies address transitions on continuum of care campuses. One study showed that nursing homes with independent living apartments on their campuses were associated with a lower Medicaid use rate (Aaronson, et al, 1994). One would expect that the level of vertical integration would be a factor that may influence older adults' transition out of a skilled nursing facility after a rehabilitative stay because of the ease in transitioning within the organization among levels of care.

Ownership Status (Horizontal Integration)

Ownership status is another organizational characteristic of interest in nursing home research because ownership status can affect the mission, values, and activities of the nursing home (Banaszak-Holl, Berta, Bowman, Baum & Mitchell, 2002). Some nursing homes operate independently from any other institution, nursing home or organization. They are considered free-standing nursing homes. Conversely, a chain is a collection of similar service organizations, like nursing homes, horizontally linked together via common ownership (Banaszak-Holl et al., 2002). Typically there are centralized parts (corporate management) with vertical links to individual nursing homes (Baum, 1999). Most chains operate on a for-profit basis, enjoying the benefits of economies of scale and reputation through brand-name recognition developed through standardization of services (Ingram, 1996). Managers within chain nursing homes may seek to maximize profits by maintaining residents with better reimbursement within the facility for a longer period of time. Ownership status may be a factor that influences older adults' ability to transition out of nursing homes after a rehabilitative stay.

In the nursing home industry, the growth of nursing home chains through acquisitions has led to concerns over resident welfare due to cost reductions. These cost reductions realized through standardization is sometimes believed to reduce the quality of healthcare services nursing homes provide their residents because cost-cutting that leads to under-investment in facilities, staff, and innovation is linked to poor quality of care for residents living in nursing homes (Banaszak-Holl, Zinn, & Mor, 1996). Therefore, one might expect skilled nursing facilities that are horizontally integrated (chain members) to prioritize profitability over resident welfare.

Size

Studies of the size of nursing homes have demonstrated conflicting results regarding quality of residents care. Smaller nursing homes have been linked to better overall resident quality improvement outcomes (Wan, Zhang, Unruh, 2006), while larger facilities have been previously associated with higher quality (Nyman, 1988). Larger facility size may allow facilities to achieve economies of scale in caring for residents through lower nurse to resident ratios. Cohen and Spector (1996) found a negative relationship between size and staffing, i.e., the larger the facility, the poorer the staffing ratios. Lower nurse, especially RN staffing, to resident ratios has previously been shown to have a negative affect on resident outcomes (Aaronson, et al. 1994; Cohen & Spector, 1996; Spector & Takada, 1991). Nursing home size may or may not be a factor that influences older adults' ability to transition out of nursing homes after a rehabilitative stay. However it is an organizational characteristic that is often studied in nursing home research, therefore it is included in this study.

Individual Resident Characteristics

Individual characteristics can be an important predictor of old age debility and may influence the ability of older adults to transition from the nursing home after a rehabilitative stay. Older adults who fail to transition out of a given nursing home after a rehabilitate stay (when Medicare Part A benefit ends) may enter into custodial care within the same nursing home. To identify possible explanations for this particular transition, one might consider in general, factors that influence older adults' admission to custodial nursing home care. Research on custodial care nursing home admissions has focused mainly on three categories of concerns: patients' health status, demographic characteristics, and the informal caregiving network available to the resident outside the nursing home. In this study we are only measuring individual health concerns and demographic variables.

The individual health concerns most likely to affect an older adults' admission to custodial care in a nursing home include cognitive status and problems associated with activities of daily living such as bathing, dressing, and grooming. Cognitive impairment is considered the greatest independent risk factor for admission, increasing the likelihood of nursing home admission by 2.3 times (Osterweil, Martin, & Syndulko, 1995; Rice, Fox, Max, Webber, Lindeman et al, 1993). Motor function impairment, as measured by ADL disability, also significantly increases the risk of custodial care nursing home placement (Bharucha, Pandav, Chanygu-Shen, Dodge, & Ganguil, 2004; Harris, Kovar, & Suzman, 1989; Lee, Kovner, Mezey, & Ko, (2001); Osterweil et al, 1995; Ruben, Siu, & Kimpau, 1992).

Demographically, individuals admitted to custodial nursing home care tend to be female and unmarried (Thom & Haan, & Van den Esden, 1997). Advanced age has previously been found to influence the likelihood of admission to a nursing home for custodial type care (Osterweil, et al., 1995). Precipitating factors such as older age, female gender, and living alone have been significantly correlated with custodial care nursing home admission (Jagger & Lindesay, 1997; Thom et al., 1997; Xie, Chausalet, Thompson, & Milard, 2002). However, the influence the demographics of advanced age alone, race, and marital status on custodial nursing home admission has not always drawn the same conclusions (Lee, et al., 2001). Individual health concerns may out-weigh these demographic factors when older adults and their families make the decision on nursing home admission.

These research studies demonstrate important findings and provide a starting point for considering why some older adults transition to custodial care following a rehabilitative stay in the nursing home instead of returning to their prior residence. Even though they may have traveled a different path towards custodial care admission to the nursing home, their health and demographic characteristics may be similar. The areas of cognitive and functional impairment, age, and gender as described in these studies may be factors that influence the ability of older adults to transition from the nursing home following a rehabilitative stay.

In addition to research on custodial care nursing home admissions, the importance of federal health quality improvement issues should not be overlooked. The Centers for Medicare and Medicaid recognize the presence of pressure ulcers, restraints, pain, and

management of depressive symptoms as important concerns among nursing home residents in their “Eighth Scope Quality Initiative (Arizona Quality, 2006). These health concerns have been given top priority because of their untoward effects on the health of older adults living in nursing homes. Each will be examined in this study as possible factors that influence the ability of older adults to transition from the nursing home after a rehabilitative stay.

Transitions

The process of transitions for older adults from a nursing home is expected to be an iterative one between the resident, the provider, the family members, the insurance company and the primary care provider (Coleman, 2004). Coleman estimates transition from a nursing home can involve from two to twelve separate entities. State and federal nursing home regulations address both the transfer and discharge of residents from skilled nursing facilities and provide minimal requirements with which the nursing facilities must meet. In brief, the law includes criteria under which the facility may transfer or discharge a resident. A written notice must be given to the resident regarding bed-hold and readmission policies (CMS, 1998). There are no specific requirements or guidelines on how to address the complex care needs of older adults during the time of transition.

A few studies illustrate approaches that can improve transitions for older adults within the health care system. Studies regarding discharge planning for older adults demonstrate that their transfer is enhanced with case management (Birmingham, 2004). Communication openness, problem solving and collaboration among the interdisciplinary team also are important factors (Hansen, Bull, & Gross, 1998). The factors of follow-up

appointment making and communication were found to be significant contributors to transitions from an acute-care geriatric ward (Leduc, Tannenbaum, Bergman, Champagne, Clarfield, & Kogan, 1998). Despite how common transitions are for older adults after a rehabilitative stay in the nursing home, no research has addressed this process. Neither individual nor organizational factors that influence transitions of older adults in skilled nursing facilities have been thoroughly evaluated. This study measured both individual resident characteristics and high level organizational characteristics with respect to transitions from the nursing home. The discharge disposition is reported in the descriptive statistics results section.

Outcomes

Outcomes in nursing research emphasize the relationship between care delivered and patient (resident) care outcomes. Although Resource Dependency Theory does not address the issue of outcomes specifically, many other examples of outcomes research are accessible. Outcomes can be described as the end product of care provided like morbidity, mortality, quality of care or quality of life. Outcomes may also describe the effect that organizational structural variables such as organizational autonomy have on patient-related outcomes such as patient satisfaction, complication rate and mortality (Aiken, 1999).

Measuring health-related outcomes has been a focus of several healthcare policy initiatives. The Committee on Nursing Home Regulation recommends that nursing home quality of care regulation for Medicare and Medicaid certification be reoriented

from assessment of the process of care to a more resident-centered and outcome-oriented evaluation (IOM, 1996).

Outcomes typically tracked in health services or nursing systems research include morbidity, mortality, and length of stay. Previously, the lack of available data limited the evaluation of nursing home residents' outcomes. Detailed clinical and payor source information is now available in an assessment tool called the Minimum Data Set (MDS) as can be found in appendix A. Using the MDS, older adults' length of stay will be used as a proxy to track transitions out of skilled nursing facilities after a rehabilitative stay. The exact discharge disposition (type of services to which residents are referred at the conclusion of their rehabilitative stay) is also of interest and will be included in the descriptive statistics part of the analysis.

Summary

Under the current incentive structure, for-profit, not-for-profit and governmental nursing homes all provide care based on the individual needs of residents who enter nursing homes for either skilled nursing or rehabilitative services (short term) or custodial (long term) care. The nursing homes then receive their reimbursement from Medicaid, Medicare, private pay, or all three sources. Reimbursement is dependent upon residents' care needs and the payers' technical rules. It is widely assumed that residents' health, social, and economic status are factors that influence older adults failure to transition out of skilled nursing facilities after a rehabilitative stay, but little is known about how the

nursing home organizational characteristics or market factors affect residents ability to transition out of nursing homes after a rehabilitative stay.

Nursing home research suggests a basis for further investigation of organizational factors that may influence older adults' failure to transition out of nursing homes after a rehabilitative stay. Resource Dependency Theory provides a model for the analysis of older adults in transition. Using this model, I studied how organizational factors based on the current incentive structure influence older adults' ability to transition out of nursing homes after a rehabilitative stay.

Research has described the reasons individual residents are admitted to nursing homes, but does not address the characteristics of residents that remain in the nursing home after a post-acute stay for rehabilitation (Jagger & Lindsay, 1997; Lee, et al., 2001; Osterweil, et al., 1995; Thom & Haan, 1997; Xie, et al., 2002). Numerous research studies describe how nursing home organizational factors affect resident outcomes (Aaronson et al., 1994; Cherry, 1991; Harrington, et al.2001; Harrington, et. al., 2000; O'Neill et al., 2003 Spector et al., 1998). Additionally, facility size and managerial staffing hours are shown to effect resident health outcomes (Castle & Banaszak-Holl, 2003). Some of these variables were included in the study.

Previous studies show various effects of organizational characteristics on resident care outcomes in nursing homes. This evokes the question of whether organizational factors may also influence how managers and decision makers within nursing homes determine if and how older adults transition out of the nursing home after a rehabilitative stay. One study found that for-profit homes with higher Medicare use rates had lower

discharge rates than non-profit nursing homes with high Medicare use rates (Aaronson et al. 1994). Murkofsky, et al., (2003) found that after the BBA, length of stay in home care decreased among Medicare patients, particularly among those receiving care from for-profit home health companies, however, no studies were found that describe factors that influence older adults length of stay in nursing homes or their failure to transition out of nursing homes after a rehabilitative stay. Whether or not older adults transition as anticipated from the skilled nursing facilities has not been evaluated since the passage of the Balanced Budget Act of 1997.

Understanding the factors that influence older adults' ability to transition out of nursing homes after a Medicare Part A reimbursed stay can provide more insight into the nature of post acute care in terms of the complexity and duration of services needed. The study results can potentially guide current attempts to improve the Medicare program through the creation of appropriate financial incentives for skilled nursing facilities and other venues of care. Evaluating care delivery systems in terms of healthcare financing, organizational structure and processes are all central to understanding if today's incentive structures will meet the demands of tomorrow (IOM, 2001).

Purpose Statement

The purpose of this study was to begin model testing of those factors that influence older adults' ability to transition out of nursing homes after a rehabilitative stay.

Hypothesis

There is both an individual and contextual effect on length of stay for older adults admitted to for-profit nursing homes.

CHAPTER TWO THEORETICAL FRAMEWORK

Introduction

A major goal of this research was to develop a framework for studying the factors that influence the ability of older adults to transition from the nursing home after a rehabilitative stay. This chapter describes how Resource Dependency can provide a theoretical basis for understanding which factors are appropriate for the model. A conceptual framework developed from the theoretical underpinnings of Resource Dependency Theory is presented. A description of each variable follows.

Resource Dependency Theory

The theoretical model for this study was developed using Resource Dependency Theory. Resource Dependency Theory (RDT) is an organizational theory that emphasizes the external control of organizational decision making and behavior (Pfeffer & Salancik, 2003). RDT was chosen for this study because the external operating environment places pressure on nursing homes to compete for scarce resources. According to RDT, organizations are dependent on scarce resources for survival. In the open market, organizations must compete amongst each other for scarce resources such as labor, raw materials, and customers. Similarly, nursing homes operate in a highly regulated, market-driven economy where they must compete against each other and with other providers of services such as assisted living and home health care for the business of providing care to older adults (Bishop, 1999). RDT holds that the degree of dependence between organizations and the resources they seek depend on the availability of resources and how critical these resources are to the success of the organization. This

interdependence between organizations and the external environment can be used to study nursing homes and their response to scarce resources (Banaszak-Holl et al, 1996; Zinn, Mor, Castle, Intrator & Brannon, 1999).

Managers and other decision makers working in nursing homes must act to insure an adequate supply of older adults (resources) to maintain their census and meet the organizations goals. Resident referrals (census) are among the most critical resources nursing homes need (Banaszak-Holl, et al., 1996). In the processes of acquiring scarce resources, managers may make decisions based on the organizational need for resources, rather on the residents' best interest. The drive for scarce resources may ultimately affect a residents' length of stay, particularly if that resident represents a good source of revenue for the nursing home. The better the payment associated with that resident, the more the incentive to have the resident stay in that nursing home.

Model Development

The development of the model began with a keen interest in the needs and characteristics of older adults receiving rehabilitative care in skilled nursing facilities and their transitions after the rehabilitative stay. Resource Dependency Theory was chosen as the basis for the development of the model because it is a systems level theory that focuses on factors external to the organization that drive organizational behavior. It was conceived that a model based on Resource Dependency Theory could be adapted for nursing homes in order to illustrate the effects of organizational and market factors on the transitions of older adults after a rehabilitative stay. RDT is a general and important theory for nursing home research, even though some of the concepts are not very

accessible or feasible to measure (Chin & Kramer, 1999). RDT considers environmental factors that impact the nursing home industry such as market and regulatory forces important, given the highly regulated, competitive market that characterizes the nursing home industry. RDT focuses on successes at the organizational level. In this model we are interested in how organizational characteristics impact the ability of older adults to transition from the nursing home. As noted in chapter 1, scientists have not yet focused much on post acute care for older adults or how their transitions could be improved within the health care system. This model was designed as a beginning point for discovering more about the transitions of older adults in the healthcare system and the environmental factors that affect those transitions. The purpose of this study was to identify what factors influence the ability of older adults to transition from the nursing home after a rehabilitative stay.

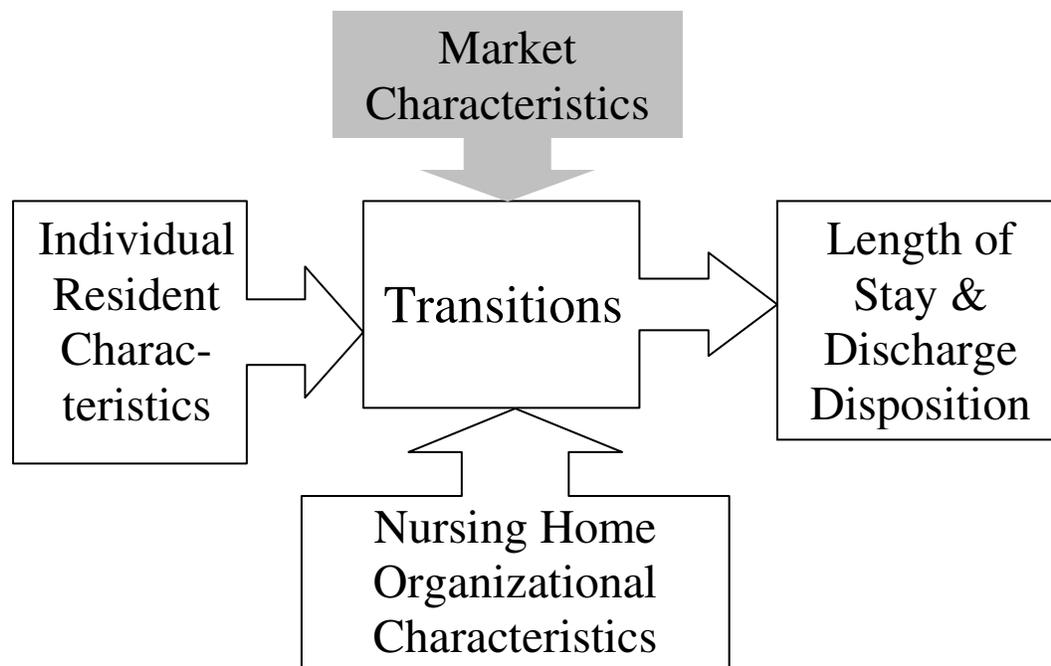


FIGURE 1: *A Model for Studying Factors that Influence the Ability of Older Adults to Transition from the Nursing Home After a Rehabilitative Stay.*

Model Structure

Figure 1 illustrates the cross-level model for this study adapted from Resource Dependency Theory. The concepts of individual resident characteristics, market factors, organizational characteristics and outcomes are described in the following sections. Market characteristics were not analyzed in this study, and are therefore in a shaded box. The model draws upon several studies in organizational research and nursing home research that add support for each variable chosen.

Model Concepts

Individual Resident Characteristics

It is important to consider individual resident characteristics such as age and medical diagnosis in the analysis of the factors that may affect older adults' ability to transition from the nursing home after a rehabilitative stay. If a study purpose is to understand or explain health care delivery determinants of an outcome, it is important that the effects of patients' own characteristics on that outcome are identified and controlled for before the effects of health care services on that outcome are isolated and measured (Tourangeau & Tu). For example, Lin (2000) controlled for patient characteristics to explore how hospital and market area characteristics affect the use of Medicare post-acute care services.

To determine the appropriate individual resident characteristics to be used in the model, the literature was searched for studies that target this post acute care group in several areas. Individual resident characteristics that were feasible to measure given the data set available and those that have been controlled for in previous studies were considered. Several health conditions such as pressure sores and physical restraints that have been widely shown to affect the health and well-being of older adults and that are also the focus of federal quality initiatives are also presented. Factors for custodial nursing home admission are also presented because they may be similar to the factors that affect older adults inability to transfer from the nursing home after a rehabilitative stay. Each area of concern is described in as follows.

Age and Gender

Several studies identify the importance of age and gender related to nursing home stays. The greatest majority of nursing home residents (41%) are women over age 85 and the second largest group (28%) is women ages 75-84 (Federal Interagency Forum, 2004). Precipitating factors for custodial care nursing home admission are age and being female (Jagger & Lindesay, 1997; Thom & Haan, 1997; Xie, et al., 2002). Readmission to the hospital from a rehabilitative skilled nursing facility stay was more likely among females (Anderson, Tyler, Helms, Hanson, & Sparbel, 2005). Given the propensity for age and gender to affect the institutionalization of older adults, both variables were included as individual resident characteristics that may affect the ability of older adults to transition from the nursing home after a rehabilitative stay.

Payor Source

A basic assumption of the model of Resources Dependency Theory adapted for nursing homes is that agents within nursing homes will seek ways to maintain residents as a scarce resource that provides a revenue stream. Revenue-based decisions within nursing homes have been previously observed. Nursing homes selected Medicare A beneficiaries for admission whose costs of care were less than the projected reimbursement, in order to insure that the facility would not lose money while caring for the resident (GAO, 2000). Residents whose costly, complex needs potentially exceeded the expected reimbursement were not as sought after in specific types of nursing homes (Angelelli, Gifford, Intrator, Gozalo, Laliberte & Mor, 2002). The hierarchy of insurance reimbursement rates to the nursing homes suggests homes should pursue residents based

on their form of reimbursement in the following order: Medicare Part A, Private Pay, and then Medicaid. At the completion of the rehabilitative stay the options for nursing homes are to accept private pay clients or Medicaid, or discharge the resident from the facility. The percentage of residents who pay privately decreased 33% from 1985 to 1995 (Bishop, 1999). Older adults who are able to pay privately are an attractive source of revenues for the nursing home and therefore, may have a longer length of stay in the same nursing home where they received rehabilitative care. Payer source is considered important to the analysis of whether or not residents discharge after a post acute stay. However, due to the lack of diverse payer sources in the sample (all were Medicaid after the post acute stay), payer source was not analyzed in this study.

Functional Status

The ability to care for oneself including ambulating, bathing, dressing, and grooming are considered among the activities of daily living (ADLs) that comprise functional status. ADL dependency is pervasive among residents in the nursing home and drives much of nursing and rehabilitative care (Morris, Fries, & Morris, 1999). Function impairment, as measured by ADL disability, also significantly increases the risk of custodial care nursing home placement (Bharucha, et al., 2004; Harris, Kovar, & Suzman, 1989; Lee et al., 2001; Osterweil et al, 1995; Ruben, Siu, & Kimpau, 1992). One study found functional status was a stronger predictor of hospital length of stay, mortality and nursing home placement than was the principal admitting diagnosis (Narain, Rubenstein, Wieland, Rosbrook, Strome, et al., 1988). Functional status is such a critical factor in the health status of older adults that it may be a significant factor in the

ability of older adults to transition from the nursing home after a rehabilitative stay. Lower levels of functional status may be linked to a prolonged length of stay in the nursing home, therefore functional status was analyzed in the study. The study used the additive four-point MDS-ADL scale (Morris et al., 1999).

Cognitive Status

Cognitive status is defined as the process of knowing. It is a combination of high-level skills that include knowledge acquisition, attention, intuition, memory, language, comprehension, judgment, use of speech, visual perception, and information processing. Cognitive impairment may be mild or severe, temporary or permanent. Severe cognitive impairment is characterized by a disruption in functional status (inability to care for oneself) and can be associated with dementia (National Gerontological Nursing Association [NGNA], 2005). In 2002 the prevalence of nursing home residents with dementia was 43.6% (Harrington, et al., 2003). Cognitive impairment is considered the greatest independent risk factor for custodial care nursing home admission, increasing the likelihood of admission by 2.3 times (Osterweil et al 1995; Rice, et al., 1993). Cognitive status may influence the ability of older adults to transition from the nursing home after a rehabilitative stay. Cognitive status was controlled for during the hypothesis testing using the Cognitive Performance Scale previously developed (Morris, Fries, Mehr, Hawes, Phillips, et al., 1994).

Presence of Pressure Ulcers

A pressure ulcer is any injury caused by unrelieved pressure that damages the skin and underlying tissue, usually over a bony prominence. Pressure ulcers are also called

decubitus ulcers, bed sores, or pressure sores and their severity ranges from reddening of the skin to severe, deep craters that have extended into the muscle and bone (Frantz, Tang, & Titler, 2004). Pressure ulcers are defined by the degree of tissue damage and categorized into four levels, i.e., Stages I through IV in accordance with the standards set forth by federal standards (Agency for Health Care Research and Quality, 1992). The prevalence of pressure ulcers among nursing home residents was 7.4% in 2002 with 68% of residents receiving special skin care to either treat or prevent sore formation (Harrington et al., 2003). Comorbid conditions associated with pressure ulcers include infection, pain, and depression (Brandeis, Morris, Nash, & Lipsitz, 1990). The presence of pressure ulcers among nursing home residents has created so much concern; the issue is included in large federal quality initiative called the “Eighth Scope” (Arizona Quality, 2006). The Eighth Scope mandates that nursing homes improve their performance regarding the assessment and treatment of pressure sores. Treatment for pressure ulcers can take from weeks to months and may delay discharge from the nursing home. Because the serious implications of the presence of a pressure ulcer, they were used in the model. Severe pressure ulcers (Stage III or IV) were analyzed separately from more mild forms of pressure ulcers (Stage I or II).

Presence of Physical Restraints

Restraints are any devices or objects that the older adults cannot easily remove and that restrict freedom of movement or normal access to his or her body (Norman, 2003). Considerable research has been done documenting the adverse consequences of physical restraints including increased incontinence, decreased mobility, increased

confusion and death (Guttman, Altman, & Karlan, 1999; Miles & Irvine, 1992). As a result, reducing physical restraints in nursing homes has become a public health concern and a focus of legislation and quality improvement activities affecting nursing homes (Arizona Quality, 2006; Janelli, Kanski, & Neary, 1994; Omnibus Budget Reconciliation Act [OBRA], 1987). The increased emphasis on restraint reduction led to a decrease in the use of restraints among nursing homes from 36% in 1990 to 26% in 1993 to 17% in 1996 (Sirin & Castle, 2002).

Nursing home facility-level characteristics may affect the use of restraints and in turn, affect residents' outcomes such as length of stay in the nursing home. Despite the overall reduction in restraint use among nursing homes, differences continue to exist among facilities during state survey inspections. For example, average percentages in 2002 ranged from 2.5 percent in Nebraska to 21.1 in Arkansas (Harrington et al., 2003). Phillips, Hawes, Mor, Fries, Morris, et al. (1996), found that when controlling for residents' physical and cognitive function, facility characteristics had a significant impact on restraint practices. Staff at skilled nursing facilities may be more apt to use physical restraints than staff at other health related facilities (Mukamel, 1997).

The process of removing physical restraints in the nursing home is complex and should require commitment among the facility management staff to address the residents' individualized needs and abilities (Werner, Koroknay, Braun, & Cohen-Mansfield, 1994). Schnelle et al. (1992), found that management practices were critical to enforcing how staff releases and reposition restrained residents. Given the likelihood that there is

facility-level variability in the use of physical restraints, the presence or absence of physical restraints used in the model.

Presence of Pain

Chronic pain is a common problem among geriatric nursing home residents and is frequently undetected and under treated (Ferrel, Ferrel & Osterweil, 1990; Sengstaken & King, 1993). Pain is a health concern that is closely associated with the problems of functional and cognitive loss and may contribute to old age debility and the ability of older adults to transition from the nursing home after a rehabilitative stay. As many as 45% to 89% of nursing home residents have pain that contributes materially to functional impairment and decreased quality of life (Ferrell, 1995; Won et al., 1999). Substantial barriers to adequate pain management include cognitive loss, multiple pain problems, and increased hepatic and renal sensitivity to drug side effects (Ferrell; Stein, 2001). Despite the attention to pain in this population, the issue often goes unnoticed by providers caring for older adults in the nursing home. Pain is such a public health concern that pain management is also part of the CMS' Eighth Scope quality initiative that mandates nursing homes improve their pain management care (Arizona Quality, 2006). The presence or absence of pain was analyzed in the model.

Depressive Symptoms Without Anti-Depressant Therapy

Depression is one of the most common and most treatable of all mental disorders in older adults, yet the prevalence of depressive disorders among nursing home residents is high, while depression recognition is relatively low (Teresi, Abrams, Holmes, Ramirez, Eimicke, 2001). Comorbid health concerns increase the likelihood that older adults will

develop depression and the lack of treatment for depression appears to be associated with poor resident outcomes. Approximately 30% of older adults with co-morbidities such as chronic pain, Parkinson's disease, and stroke develop major depression (Piven & Titler, 2001). Without treatment, depression can be life threatening.

In the early 1990s, studies suggest that 15% of nursing home residents displayed major depression and another 16.5% exhibited minor or sub-syndromal depressive symptoms (Rovner, et al, 1991). Heston et al. (1992) found that only 10% of nursing home residents with a diagnosis of depression were treated with antidepressant medication. In 1991, depressed residents admitted to a nursing home had a fifty-nine percent greater likelihood of death in the first year following admission compared to those without a major depressive disorder (Rovner, et al., 1991). Despite previous research, nursing homes remain an environment where older adults are at risk for depression due to the multiple losses of home and health associated with nursing home admission (Illinois Foundation for Health Quality [IFQHC], 2006).

Recognizing and treating the symptoms of depression in nursing home residents is a new focus of CMS' Nursing Home Quality Initiative in all participating states (Arizona Quality, 2006; IFQHC, 2006). Symptoms of depression without anti-depressant therapy were analyzed in this study due to the likelihood that depression may affect the ability of older adults to transition from the nursing home after a rehabilitative stay.

Medical Diagnoses

In the analysis of the factors that affect older adults' ability to transition from the nursing home after a rehabilitative stay would not be complete without considering the

individual residents' medical diagnoses. The prevalence of numerous complex medical diagnoses (comorbidities) is common among the cohort of older adults receiving rehabilitative care in the nursing home and may be a significant factor in their failure to return home at the end of their stay. For example, older adults readmitted to the hospital during a rehabilitative nursing home stay typically had 8 medical diagnoses and most did not return home after readmission from the skilled nursing facility (Anderson, M.A., Tyler, D., Helms, L.B., Hanson, K.S., Sparbel, K.J., 2005). In one risk-adjusted hospital mortality study, Tourangeau & Tu (2003) found that the greatest determinant of patient mortality was individual patient characteristics such as medical diagnosis.

A frequency analysis was completed to determine which medical diagnoses were most prevalent in the sample. The twelve most common diagnoses were included in the model. Describing the diseases that are most prevalent among the subjects in this analysis may be of interest to managers, clinicians, and researchers and help plan for better transitions from nursing homes to the home setting.

Organizational Characteristics

A basic tenant of Resource Dependency Theory as applied to nursing homes is that agents within the nursing home react to stimuli in the external operating environment make decisions to protect the interests of the home. Actions managers take are based on the relative position of the home when compared to other nursing homes drawing from the same pool of resources. Resident census drives the nursing homes success (and reason for being). Securing resident census through managerial decision making is an important activity to nursing homes, particularly if their goal is profitability. Hypotheses for this

study suggest that both individual resident characteristics and organizational variables impact the ability of older adults to transition from the nursing home after a rehabilitative stay.

Nursing home research in recent years has focused on the facility-level variables of profitability status, size, free-standing/chain membership; level of vertical integration and percentage of Medicare/Medicaid census. These variables are widely used due to their accessibility in publicly available data sets and are generally believed to explain some variability in the activities among nursing homes. The most common organizational characteristics found in nursing home research literature and their link with outcomes were presented in chapter 1 (Aaronson et al., 1994; Banaszak-Holl, et al., 1996; Cherry, 1991; Cohen & Spector 1996; Harrington, et al., 2003; Harrington, et al., 2001; Harrington, et al., 2000; O'Brien, Saxberg, & Smith, 1983; O'Neill et al., Spector & Takada, 1991). These variables provide a high level evaluation of nursing homes and are the best available without conducting data collection in each home. Support for using each variable in this study was also presented in chapter one.

Market Characteristics

Resource Dependency Theory holds that external environmental factors affect agents' behavior within organizations relative to the procurement of scarce resources. In the nursing home research, relevant market characteristics include local market competition and demand, state regulations and payment policies, and regional influences (Banaszak-Holl, 2002). The background of market characteristics began in chapter one with the discussion of Medicare/Medicaid reimbursement and the Balanced Budget Act

of 1997. Information about local market competition such as percentage of occupied nursing home beds in the area and number of home health agencies are typically used in nursing home research to study the market impact on a topic of interest. Market characteristics are important consideration and were included in the model, even though they were not measured specifically in this study. To emphasize this point, market characteristics appear in a shaded box on the model. The influence of market characteristics on older adults' ability to transition from nursing homes after a rehabilitative stay will be addressed in subsequent research.

Outcomes

Resource Dependency Theory does not specifically measure the outcome of scarce resources, but articulates the success of the organization based on its ability to procure scarce resources. In this study, the outcome of interest was the ability of older adults to transition from the nursing home after a rehabilitative stay. Length of stay (in days) was used as a proxy to measure the time each resident spends in the nursing home

The discharge dispositions of older adults following a stay in the skilled nursing facility include a few specific possibilities and are listed on the MDS tracking form. Residents may remain in the nursing home, move to another nursing home, transfer to assisted living, transfer to an acute care or psychiatric hospital, transfers to a residence with or without home health, or die. It is estimated that 19% of residents admitted to the SNF transfer back to the hospital within 30 days (Kramer, Eilertson & Lu, 2000). The MDS discharge tracking form was used to determine where residents transitioned to after the rehabilitative stay.

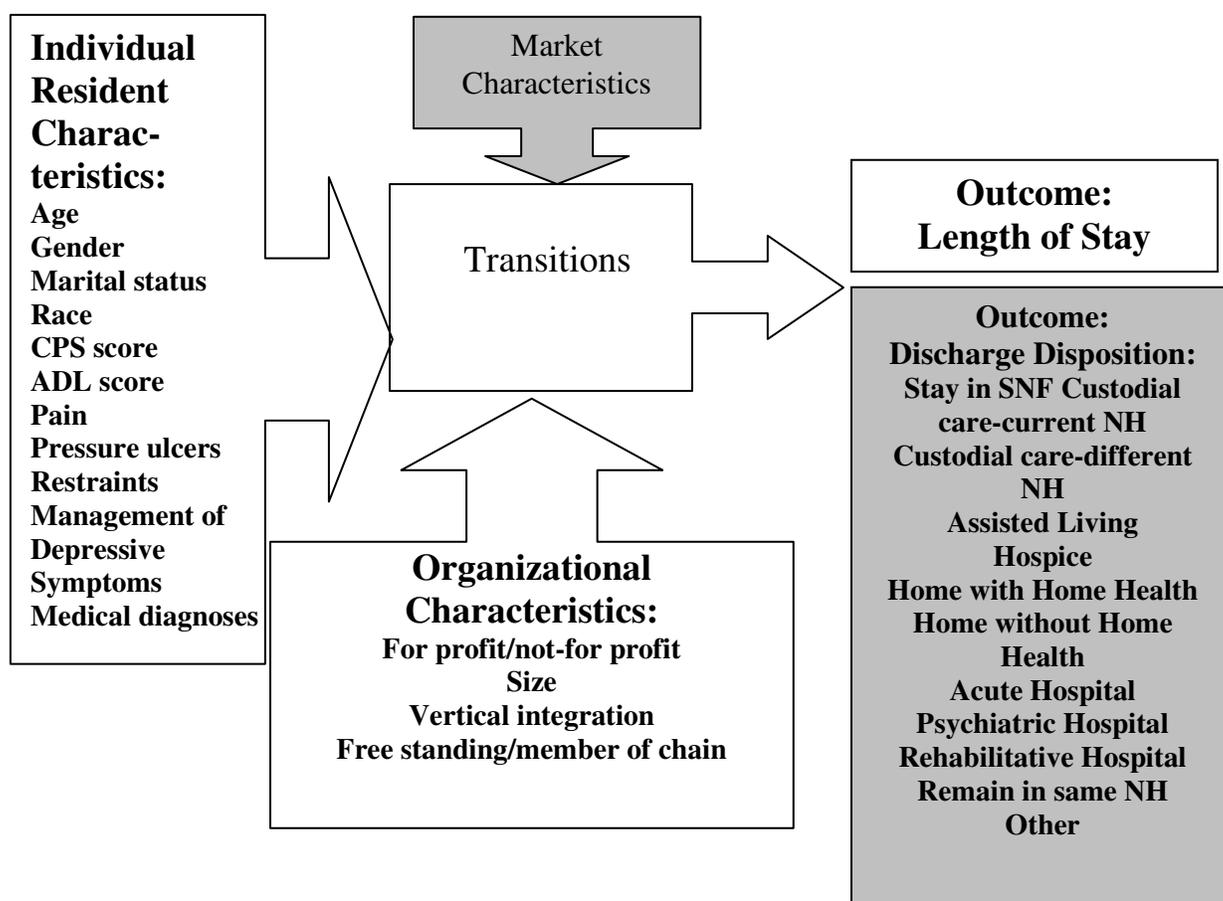
Summary

In conclusion, a cross-level conceptual model based on Resource Dependency Theory was developed in order to begin understanding what factors influence older adults' ability to transition from the nursing home after a rehabilitative stay. Support was described for including the factors of individual resident characteristics, organizational characteristics, and market characteristics and their influence on transitions resulting in resident outcomes. In this particular study, market characteristics were not evaluated due to the lack of available data, but they remain as a consideration for future research. This study was designed to begin to test a model based on Resource Dependency Theory on how the competition for scarce resources affects older adults transitioning from the nursing home after a rehabilitative stay.

CHAPTER THREE METHODOLOGY

Introduction

The purpose of this study was to develop and test a model for studying the transitions of older adults after a Medicare Part A reimbursed stay in the nursing home. The study model, based on Resource Dependency Theory, shows the hypothesized relationships between individual characteristics, facility characteristics, and nursing home resident outcomes (see figure 2).

FIGURE 2: *Study Model*

Design

The study was a secondary analysis of Minimum Data Set (MDS) and Medicare's Nursing Home Compare data. Variables available in the database were organized using the study model. Contextual regression was used to analyze the individual and organizational (context) effects on the outcome length of stay. Frequency analysis was used to study the population demographically and to evaluate discharge disposition, a related outcome of the study. The contextual effect of market characteristics were not examined, but may be included in a subsequent study. Since neither market characteristics nor discharge outcomes were central to the analysis, they are both shown in a shaded box in Figure 2.

Data Collection Tools

Minimum Data Set

The Minimum Data Set (MDS) was mandated by the Omnibus Budget Reconciliation Act of 1987 as a system for monitoring the individual health status of residents living in nursing homes (OBRA, 1987). The MDS is shown in Appendix A. All nursing homes participating in Medicare or Medicaid (97% of all nursing homes) are required to complete a resident assessment process. Most homes elect to use the Minimum Data Set version 2.0 to collect data on individual residents (CMS, 2006). The data to be used in this study was collected by facility staff, following The Centers for Medicare and Medicaid (CMS) approved guidelines.

The MDS is an instrument that is completed by nursing home staff based on demographic and clinical information about nursing home residents (see Appendix A).

The MDS consists of 120 items organized into 23 sections. The sections range from demographic data fields such as age and gender to medications, diagnosis, and treatments. The nursing home staff record resident-specific data on the MDS at time intervals specified by Medicare and Medicaid guidelines. Medicare requires that facilities participating in the Medicare Part A program complete an MDS for every resident upon admission to the skilled nursing facility and at 14, 30, 60, and 90 day intervals. Nursing homes are reimbursed based on the scores of each individual resident's MDS.

MDS scoring is generally based on a 7-day reference period whereby staff record information based on observations made within the 7-day time frame. MDS information is maintained within the residents' medical record and transmitted to state and federal authorities as required by Medicare and Medicaid guidelines. At the completion of the Medicare Part A stay in the skilled nursing facility, a discharge tracking form is completed for each resident that reflects their date of discharge and the location to which they were discharged. Possible discharge outcomes are listed in the Coding Dictionary (see Appendix C).

Nursing Home Compare

CMS maintains a database of all nursing facilities that participate in the Medicare Part A program. Facility information such as name, address, size, and profitability status is publicly available at Nursing Home Compare, a CMS web site for consumer use (CMS, 2006). Facility characteristic information of size, profitability status, and chain status was taken directly from the web site using the facility Medicare provider number

recorded on each MDS. Most nursing homes maintain their own web site. For this study, information regarding the level of vertical integration was determined via the facility web site and confirmed with the dissertation chair that had first hand knowledge of each facility's operation at the time of the initial study.

Sample and Primary Data Collection

One hundred and sixty resident MDS records from a previous study completed in Washington State nursing homes in 2000 were analyzed in this study. The original sample was a convenience sample of residents admitted to nursing homes that were geographically near the investigators. The sample for this study included all MDS data completed for residents experiencing a Medicare Part A reimbursed stay in the skilled nursing facility. To ensure anonymity, names and social security numbers were removed from the records. Only a sequence number was assigned to each record during the initial data analysis. Clinical information and demographic data fields from the nursing home Minimum Data Set (MDS) were used to describe Medicare Part A beneficiaries' health concerns, length of stay and discharge disposition during a rehabilitative stay at a skilled nursing facility. Nursing Home Compare was used to determine the facility level variables (CMS, 2006). Table 1 lists the model variables and corresponding data elements from the MDS document and Nursing Home Compare web site.

TABLE 1: *Model Variables and Corresponding Data Elements*

Model Construct and Variable	MDS/Nursing Home Compare
Individual Characteristic: Age	MDS: Difference between MDS reference data (A3a) and birthdate (AA3).
Individual Characteristic: Gender	MDS: AA2.
Individual Characteristic: Race	MDS: AA4.
Individual Characteristic: Marital status	MDS: A5.
Individual Characteristic: Cognitive status	MDS: CPS scale from section B and C. This scale will describe the residents' level of cognitive function.
Individual Characteristic: Functional status	MDS: ADL scale from section G. This scale will describe the resident's ability to dress, bathe, groom self.
Individual Characteristic: Pain	MDS: Section J2b2,3. This variable records the presence of moderate or severe pain.
Individual Characteristic: Restraint	MDS: Section P4. This variable records the use of a trunk, limb, or chair restraint.
Individual Characteristic: Pressure Ulcers	MDS: Section M1a,b,c,d. This variable records the presence of a Stage I, II, III or IV pressure ulcer.
Individual Characteristics: Management of Depressive Symptoms	MDS: Section E, I1ee, and O4c. This variable records the prevalence of symptoms of depression without antidepressant therapy.
Individual Characteristics: Medical Diagnoses	MDS: Section I
Facility Characteristics: For profit/not-for profit, size, vertical integration, free standing/member of chain;	Nursing Home Compare web site.
Discharge Outcome	MDS: Discharge Tracking Form. All possible variables are listed on Figure 2.
Length of Stay Outcome (in days)	MDS: Computed variable to reflect difference between resident discharge date and admissions date.

Informed Consent and Human Subjects Approval

Initial study Institutional Review Board (IRB) approval was received from Washington State University. The University of Arizona, IRB approved this secondary data analysis (see Appendix B).

Reliability and Validity of Primary Data

The overall reliability of the Minimum Data Set instrument for research purposes has been established (Hawes, Morris, Phillips, Mor, Fries, et al., 1995; Morris, Hawes, Fries, Phillips, Mor, Murphy, et al., 1990; Sgadari, Morris, Fries, Ljunggen, Jonsson, et al., 1997;). Eighty-nine percent of the items had intraclass correlations scores of 0.4 or higher and 63% of the interclass correlations were at least 0.6 (Hawes, 1995).

Construct validity has been established for the domains of cognition (Hartmaier, Sloane, Guess, & Koch, 1994; Hartmaier, Sloane, Guess, Koch, Mitchell, et al., 1995; Morris, Fries, Mehr, Hawes, Phillips, et al., 1994; Snowden, McCormick, Russo, Srebnik, Comtois et al. 1999) and ADL scores, (Morris, Fries, & Morris, 1999; Hartmaier, et al.; Snowden, et al; Williams, Yi, Fries, & Warren, 1997). Confirmatory factor analysis yielded modest size coefficients for the depression fields (Lawton, Casten, Parmelee, Van Haitsma & Kleban) and relatively low correlations with the Geriatric Depression Scale (McCurran, 2002). Interrater reliability of the mood section was reported to be .68 (Morris, Nonemaker, Murphy, Hawes, Fries et al., 1997). The MDS is a valid predictor of pressure sore risk (Vap, 2000).

Since 1998 the MDS has been used to determine Medicare Part A reimbursement within the SNFs, making MDS accuracy critical to the SNF. The Centers for Medicare

and Medicaid (CMS) initiatives also have placed increased emphasis on the accuracy of data within the MDS. All nursing homes that participate in the Medicare Part A program (97%) must electronically submit all Medicare Part A MDSs to their respective state agencies where they are reviewed for completeness and timeliness. The facilities receive feedback and are expected to correct any errors. The state agency also provides reports to the nursing home state survey teams that in turn, use the information during on-site facility audits. Failure to comply with the MDS guidelines and other regulations can result in deficiencies or fines to the facility or corporation that owns the home.

Nursing Home Compare allows the public to view facility-level quality measures, driven from MDS results, on the Internet at (CMS, 2006). Nursing Home Compare is designed to help the public select a nursing home based on various performance criteria. Skilled nursing facilities facing regulatory and market pressure are therefore, highly motivated to maintain MDS data in accordance with state and federal regulatory guidelines and keep their internal MDS completion processes as accurate, complete, and timely as possible.

Unit of Analysis and Data Analysis

Descriptive statistics were used to examine the distribution and measures of central tendency of the variables in the model. The researcher was concerned with measuring both the impact of the individual resident characteristics and facility characteristics on the older adult's ability to transition from the nursing home after a rehabilitative stay. Contextual regression considers if the context, in this case facility characteristics, contributes to the variance of length of stay after individual characteristics

have been taken into account. Contextual regression, a form of linear regression, requires an unbound dependent variable. Length of stay was chosen as the dependent variable because it was unbound and analysis of length of stay might provide information about the residents who remained in the nursing home over a longer period of time.

The individual characteristics were taken from the last MDS completed prior to the end of the Medicare Part A stay to provide a representation of the resident at the time of transition. Descriptive statistics were used to describe the individual and facility sample and to report the discharge disposition of individual residents. The SPSS statistical software program allowed for an analysis of both the contextual effects and individual effects on the outcomes of interest using linear regression.

Summary

This research study was designed as an initial test of a model based on Resource Dependency Theory for studying the transitions of older adults after the post acute Medicare Part A stay in the nursing home. The study model included the constructs of individual characteristics, facility characteristics, transitions, and outcomes of discharge disposition and length of stay. Due to the limitations of available data, market characteristics were not included in this analysis. Contextual regression was used for hypothesis testing. Descriptive statistics were used to describe the individual and facility characteristics and discharge dispositions. Chapter 4 will discuss the selection and conversion of the variables into the constructs within the study model.

CHAPTER FOUR CREATION OF THE ANALYTIC FILE

Introduction

The data set used in this study is federally government-mandated and widely used in nursing homes across the U.S. Secondary data analysis is the use of data gathered in a previous study to test new hypotheses or explore new relationships among variables that were previously not analyzed (Polit & Hungler, 1995). Secondary data analysis can present challenges to the researcher such as coding errors, missing data, and inaccessible information (Shadish, Cook, & Campbell, 2002). The data set was approached with an awareness of the potential benefits and limitations of doing a secondary data analysis with MDS data.

This study began with a review of an existing data set of MDSs from three hundred residents residing in three Washington State nursing homes from a previous unrelated study. An analytic file was created to address the current research questions. Cases selected for the current research include all MDS files of residents admitted to the nursing home under the Medicare program for post-acute rehabilitation. Once the initial selection was completed, the process of data management began.

Data management of a secondary data set consists of addressing issues of data cleaning, computation of variables for the creation of an analytic file, and data analysis. Initially, duplicate records were identified and deleted. Decision rules for the inclusion and exclusion of data and addressing missing data were developed based on a review of the literature, Medicare guidelines, (CMS, 1998) and consultation with the dissertation chair and other experts. Variables needed for the current analysis were based on the

theoretical model (chapter 2) and provided support for the study's hypotheses. The MDS data set and Medicare's Nursing Home Compare web site were used in the computation of variables. Rationale for the use of these sources was previously discussed in chapter 3.

Chapter four is organized with respect to the theoretical model. Decision rules for data cleaning and variable computation begin with a description of individual resident characteristics, followed by organizational characteristics and outcome variables. A complete list of codes for each variable can be found in the coding dictionary (see Appendix C).

Individual Characteristics

Age

The age variable was calculated arithmetically in years by using the difference in the date of discharge from Medicare and the date of birth. The birth date comes from the MDS data set (Section AA3). The discharge date comes from the MDS data set (Section R in the Discharge Tracking Form). When the specific discharge date was not stated, it was imputed using decision rules that will be described in the "length of stay" section, found later in chapter four. Given that this analysis targeted the condition of residents at the time of discharge, the age at the time of discharge was used to represent the residents' age.

Gender

The resident gender variable was taken from the MDS (Section AA2) and coded 0=male, 1=female.

Marital status

The marital status variable was taken from the MDS (Section A5) and coded 0=not married, 1=married.

Race

The race variable was taken from the MDS (Section AA4) and coded 0=all other, 1=Caucasian.

Cognitive Functioning

Morris et al. (1994) previously developed the Cognitive Performance Scale (CPS) based on data from the Memory, Communication and Physical Functioning sections of the MDS (Sections B, C, and G respectively). The scale is a predictor of cognitive function with scores ranging from 0-6. Zero= no cognitive impairment and 6=severe cognitive impairment. The complete scoring for the CPS is found in table 2. In this study, a continuous random variable was calculated based on the criteria for the CPS and added to the analytic file.

TABLE 2: *Cognitive Performance Scale (CPS) Scoring*

CPS Score	Level of Cognitive Impairment
0	No cognitive impairment
1	Borderline intact
2	Mild impairment
3	Moderate impairment
4	Moderate severe impairment
5	Severe impairment
6	Very severe impairment

Note: The Cognitive Performance Scale (CPS) found in Morris, J.N., Fries, B.E., Mehr, D.R., Hawes, C., Phillips, C., Mor, V. et al. (1994). MDS Cognitive performance scale. *Journal of Gerontology : MEDICAL SCIENCES*, 49(4), M176-M182.

Physical Functioning

Morris, Fries, and Morris (1999) suggest using data from the MDS to derive scales reflective of residents' activities of daily living (ADL). In this study, physical functioning was a continuous random variable based on summing across 4 items that range from 0-4. The MDS items of personal hygiene (Section G1j), toileting (Section G1i), locomotion (Section G1e) and eating (Section G1h) were score from 0-4, providing a range of 0-16 whereby 0=independent in all ADLs and 16=totally dependent in all ADLs.

Pain

A dichotomous variable was computed for individual resident pain scores. If the MDS score indicated daily pain, or pain less than daily (Score of 1 or 2 in Section J2a), the resident was considered to have pain and coded 0=no pain, 1=presence of pain.

Pressure Ulcers

The presence of pressure ulcers is recorded on the MDS using clinical staging criteria found in both research and practice (Frantz, Tang, & Titler, 2004). Pressure ulcers were scored from 0=no pressure ulcer present to 4=a full thickness wound with exposed bone present (Frantz et al.). The presence and stage of pressure sores was considered important in capturing each individual resident's health status.

Two variables were created to reflect the severity of pressure ulcers. The first variable addressed the presence of a stage I or II pressure ulcer; 0=no pressure ulcer, 1=Stage I or II pressure ulcer. The second variable addressed the presence of a Stage III or IV pressure ulcer; 0=no pressure ulcer, 1=Stage III or IV pressure ulcer.

Physical Restraints

A physical restraint is a device that inhibits resident movement to the extent that they cannot remove the device themselves (Resident Assessment Instrument Manual 2.0, 2000). MDS items that indicate restraint use were full side rails (P4a), trunk restraint (P4c), and limb restraints (P4e) and chair prevents rising (P4f). If any of these were present on individual residents' MDSs, the resident was considered to be restrained, therefore; 0=no restraint, 1=restraint present.

Depressive Symptoms Without Treatment

A dichotomous variable was used to analyze the presence of depression without anti-depressant therapy. The analysis uses MDS data from the Mood and Behavior (Section E) Disease Diagnosis (Section I1ee), and Medications (Section O3c) sections. Residents are considered depressed if they either have symptoms in the mood and behavior section or have a diagnosis of depression or both. Medications (Section O3c) are scored 0-7, based on that number of days during the assessment reference period that the resident received anti-depressant therapy. For the purposes of the analysis, any resident recorded as a 1-7 (using anti-depressants 1-7 days) was considered to be under treatment with antidepressants.

The resident scored a "0", if no mood and behavior symptoms were present and the resident did not have a diagnosis of depression. The resident scored a "1" if mood and behavior symptoms were present or the resident has a diagnosis of depression and was *not* on anti-depressant therapy.

Organizational Characteristics

The organizational characteristics in the analysis were those variables indicated on the conceptual model as “Organizational characteristics”. All organizational characteristics refer to the nursing home in which individual residents received care. Heretofore the term “organization” refers to the nursing home or nursing facility and “organizational characteristics” refer to the characteristics of the nursing home or nursing facility. A categorical variable was used to assign residents to one of three nursing homes.

Each MDS contains a facility provider number (Section AA6) that was used to link each resident record to the nursing home where they received care. The facility provider numbers reveal that residents were in one of three facilities. No residents entered more than one of these three facilities during the initial study. Organizational-level variables were associated with each individual resident record.

Nursing home facility information was taken from the Nursing Home Compare web site which is in the public domain and can be used to search for information about facilities and link to their own web sites (CMS, 2006). Information about the “level of vertical integration” variable was from each facility’s web site. All nursing facility characteristics were verified with the dissertation committee chair who had first-hand information about each facility. The organizational variables were facility size, facility profitability status, facility ownership status, and level of facility vertical integration.

Size

A continuous variable represents facility size; range was 75-145.

Profitability Status

A dichotomous variable was based on the profitability status of the facility as recorded with the Medicare program (CMS, 2006); 0=not-for-profit, 1=for-profit.

Chain Membership

A dichotomous variable was based on the chain-membership status of the facility as recorded with the Medicare program (CMS, 2006); 0=non chain member, 1=chain member.

Level of Vertical Integration

A vertically integrated facility is one that has another level of care such as assisted living, independent living, or Alzheimer's care under the same owner and on the same campus as the nursing facility (see chapter 2); 0=not vertically integrated, 1=vertically integrated.

At the time of the original data collection, one facility owner was building an assisted living facility on the same site as the nursing facility. The same nursing facility also was part of a not-for-profit health care system and a part of an acute care campus. An acute care setting (hospital) on the nursing home campus does not meet the definition of vertical integration as presented in chapter 2. Since the assisted living addition was under construction and not receiving residents at that time, *and* the presence of a hospital on the campus did not meet the criteria for vertical integration, the facility was coded a "0", not vertically integrated.

Outcome Variables

One of the objectives of this dissertation was to develop methods for using MDS data for this study and in future research. A critical step in this analysis was the computation of the outcome variable for individual length of stay. Considerable reflection was given regarding which time frame would best address the question of why older adults failed to transition after a post acute stay.

During the process, three separate lengths of stay variables were computed. Not all of these variables were used in the study. For example, three separate lengths of stay variables were computed based on a) the time in the nursing home under the Medicare Part A stay only, b) the time in the nursing home after the Medicare Part A stay ended (custodial stay), and c) the time from admission under Medicare Part A to the time of discharge irrespective of payer source.

Ideally, the analysis would have used the length of stay variable after the Medicare Part A stay ended. Using this length of stay variable as the outcome variable fit well temporally with the assessment of the individual characteristics at the point of transition from the Medicare Part A stay. Given that only 38 residents remained in the nursing home after the Medicare Part A stay ended, however, the analysis would have been underpowered. Ultimately, the entire length of stay variable from Medicare Part A admission to discharge from the facility was selected for use in the study. Three methods for calculation of the lengths of stay variables based on MDS data are offered in this chapter as a potential contribution to the body of nursing science.

Medicare Part A Length of Stay

For the majority of resident MDS records in the data set, the Medicare Part A length of stay was a simple computation of the discharge data minus the admission date, yielding a numeric value in “days”, representing the number of days the resident was in the nursing home receiving Medicare Part A funds to pay for their care.

Custodial Length of Stay

A custodial length of stay was calculated to determine the length of stay for residents remaining in the nursing home under another payer source after the end of the Medicare Part A reimbursed stay. The presence of a non-Medicare MDS in the data set identified these residents (Section Aa8a=1-10 and Aa8b are blank). Basically, the custodial length of stay was the difference in days between the discharge date and the date of transition from Medicare Part A to a different payer source. For those residents remaining in the same nursing home after the Medicare Part A reimbursed stay ends, an exact transition date from Medicare to another payer source was not available because the MDS does not specify the exact day residents convert to a different payer source. Therefore, the first state-required MDS was used to estimate the discharge date for those residents.

One strategy for imputing missing data is to bracket the data within a range of plausible values (Shadish, Cook, & Campbell, 2002). This method was used because the data set contained many related items that provided clues about the transition date. For example, typically, the first state-required MDS after the Medicare MDS sequence was a quarterly review assessment (Section AA8a=5). This MDS was used to approximate the

date the resident's Medicare reimbursed stay ended and another payer source began. A discharge date from Medicare services was estimated based on logical rationale and understanding of the Medicare/Medicaid MDS schedule and other requirements. These decision rules are included at the end of this chapter. The discharge date was usually taken from the discharge tracking form. For those residents with no discharge tracking form, the date of the last state required assessment was used to estimate the residents' discharge date.

Medicare Part A and Custodial Length of Stay

For Medicare and custodial length of stay, the admission date was also based on the Medicare Part A admission date and the discharge date taken from the discharge tracking form. This length of stay included the resident's entire stay, i.e., the Medicare Part A stay as well as the custodial stay under another payer source. The Medicare and Custodial length of stay variable was used as the dependent variable in this study.

Decision Rules

1. Concern: For 12 records, the admission date is missing on the MDS.

Resolution: An admission date is assigned three days prior to the first MDS assessment date completed during the Medicare Part A reimbursed stay

Rationale: Medicare requires the first MDS assessment be completed between the 5th and 8th day after admission to the nursing home (CMS, 1998). Observations of records in this data set showed that most initial MDSs were complete between the 3rd and 5th day after admission. In 1999-2001 facilities were often reluctant to use the 6th, 7th, and 8th days (termed grace days) for fear of subsequent penalties (Personal communication, Bonnie

Estes, 2000). Standard practice at that time was consistent with the researcher's observations that initial MDSs (in this data set) were done 3-5 days after admission making the imputation of an admission date 3 days prior to the first MDS a reasonable solution.

2. Concern: Thirty-eight resident's record contained state-required MDSs, which indicates that the resident remained in the nursing home after the Medicare-reimbursed stay. There is ambiguity here regarding the transition date from the Medicare Part A reimbursed stay to the stay under a different payer source.

Resolution: Assign the resident a discharge date from the Medicare Part A stay based on the Medicare and state required MDS assessment rules.

Rationale: All Medicare and Medicaid required MDS records for each resident in this study are included in the MDS data set. The payer source and the dates that residents were in the facility can be verified using the MDS dates. Medicare requires MDS assessments be done on a 5, 14, 30, 60, and 90-day assessment schedule. State-required MDSs are completed within 14 days of admission and every 90 days thereafter. Other state-required MDSs also are completed based on Omnibus Budget and Reconciliation Act (OBRA) requirements.

When the issue of missing values is not extensive, it is often useful to substitute real data values for the missing value codes (Polit & Hungler, 1995). Using frequency analysis, it was determined that about 24% of residents in the study remained in the nursing home after the Medicare Part A reimbursed stay. The mean of the possible days was used when there was more than one plausible transition date from the Medicare Part

A reimbursed stay to a different payer source. MDSs in the data set were evaluated to identify where the Medicare assessment sequence was broken—indicating a change to another payer source. For those remaining in the nursing home under another payer source, a state-required assessment follows one of the above listed Medicare assessments within 90 days. The omission of any of the sequential Medicare-required assessments followed by a state-required assessment makes it possible to estimate the date that the resident transitioned from Medicare. For example, the 5-day Medicare-required MDSs for one resident occurred in the appropriate sequence. However, the 14-day Medicare-required MDS is missing. Instead, the subsequent MDS is a state-required MDS completed 90 days later. Given this sequence, we assume that the resident was discharged from Medicare between the 6th and 14th day after the Medicare admission. The discharge data was imputed to be 10 days after the 5-day MDS.

3. Concern: Twelve residents with MDSs completed only while under a Medicare Part A reimbursed stay (no state required assessments in the data set), do not have a discharge date.

Solution: A discharge date is assigned between the date the last Medicare required MDS was completed and the next *scheduled* MDS that was not completed. The date representing the mean number of days was used.

Rationale: If the resident had remained in the facility, the next MDS would have been done sequentially according to Medicare guidelines. Since no state-required MDS was in the file, I assumed that resident was discharged shortly after the last Medicare required MDS. The lack of a Medicare required MDS in the file indicated that the resident was no

longer in the facility. Note: A few residents re-entered the facility within 5 days of discharge. Discharge dates for those residents' initial Medicare stays were also imputed using the mean number of days.

Summary

Secondary data analysis can present challenges to the researchers such as coding errors, missing data, and inaccessible information. The development of methods to address the length of stay variable was considered a valuable product of the study and may be useful in future research. Every effort was made to ensure construct validity when variables had to be computed or imputed. Changes were discussed with the chair to ensure integrity of the process. The entire coding scheme and MDS are included for your reference (see Appendices A and B).

CHAPTER FIVE RESULTS

Introduction

The purpose of Chapter 5 is to report the results of the study. The chapter contains a description of the sample, the correlation results, the regression results, a discharge outcome analysis and a summary. This study focuses on older adults admitted to the nursing home in order to receive rehabilitation after a hospitalization. The sample consisted of 155 MDS records that represented 155 distinct nursing home resident stays in the skilled nursing facilities. The chapter includes a descriptive analysis of the individual characteristics, facility characteristics, and discharge outcomes. Included in the descriptive analysis is a sub sample of those who had an extended stay (remained in the same nursing home after the Medicare Part A stay ended) ($n=38$) and those who were discharged immediately following the Medicare Part A stay ($n=117$). Medical diagnoses are also used included to describe the individual characteristics of the sample.

Facility characteristics are reported with respect to the facility variables included in the study; with the discharge outcomes reported descriptively. The entire analysis is based on the last Medicare-required MDS completed prior to discharge from the Medicare Part A reimbursed stay. This provides an indication of the residents' status at the conclusion of their Medicare Part A reimbursed stay. Results are included in table format and summarized in the text. Discussion of results and relevance to the study to practice and policy are presented in chapter 6.

Sample

Individual Characteristics of the Sample

Most residents were white (98.1%) and a little over half were female (61.9%) with their mean age being 82 years old ($SD=7.6$). Table 3 summarizes the individual characteristics for the sample and sub sample. Records showed that 34.8%, ($n=54$) of the sample had pain; 27.1% ($n=42$) had physical restraints, and 21.9% ($n=34$) had symptoms of depression without treatment. Cognitive Performance Scale (CPS) scores indicated that the total sample was cognitively intact or mildly cognitively impaired ($M=1.15$, $SD=1.45$). Cognitive Performance Scale scoring can be found in Table 2.

Most residents in the total sample had some functional impairment ($M=6.0$, $SD=5.0$) based on the Activities of Daily Living Scale (potential scores range from 0-16). Residents in the sub sample that had extended stays in the nursing home tended to be older ($M=82.9$, $SD=7.4$), and scored higher on the ADL ($M=8.2$, $SD=4.1$) and CPS 1.7 ($SD=1.4$) scales than those residents who discharged from the nursing home when their Medicare Part A stay ended.

A frequency analysis was completed to evaluate which diagnoses were most prevalent among the sample and might therefore be included in the model. The most prevalent medical diagnosis among the sample ($N=155$) was hypertension 54(35%), falls 52 (34%), arthritis 50(32%), depression 48(26%), and anemia 47(24%). The cardiovascular disease (CV) variable was computed from the MDS items of arterial sclerotic heart disease, cardiac dysrhythmias, peripheral vascular disease and other vascular diseases. All other diagnoses were taken directly from section I on the MDS.

TABLE 3: *Individual Characteristics: Total and Sub Samples*

	Total (N=115)		Discharged from Med. A (n=117)		Extended stay in NH (n=38)	
	M, SD	n(%)	M, SD	n(%)	M, SD	n(%)
Age ^a	82.1, 7.6	-	81.8, 7.7	-	82.9, 7.4	-
ADL score ^b	6.0, 5.0	-	5.4, 4.4	-	8.2, 4.1	-
CPS score ^c	1.2, 1.5	-	1.00, 1.4	-	1.7, 1.4	-
Race						
White	-	152 (98.1)		115 (98.3)		37(97.4)
All other		3 (1.9)		2 (1.7)		1(2.6)
Marital						
Not married		110 (71.0)		84(71.8)		26(68.5)
Married	-	45(29.0)	-	33 (28.2)		12(31.6)
Gender						
male	-	59 (38.1)	-	46 (39.3)	-	13(34.2)
female		96 (61.9)		71 (60.7)		25(65.8)
Presence of Pain		54 (34.8)		80(68.4)		21(55.3)
Presence of Restraints		42 (27)		28(23.9)		14(36.8)
Presence of depression		34(21.9)		23(19.7)		11(28.9)
Presence of hip fracture		24(15.5)		15(12.8)		9(23.7)
Emphysema/COPD		26(16.8)		18(15.4)		8(21.1)
Presence of any Pressure Ulcer		14(9.0)		13(11.1)		1(2.6)
Stage I or II						
Stage III or IV		5(3.2)		5(4.3)		1(2.6)
Presence of CHF		36(23.2)		29(24.8)		7(18.4)
Presence of anemia		47(30.3)		35(29.9)		12(31.6)
Presence of hypertension		54(34.8)		36(30.8)		18(47.4)
Presence of any CV disease ^d		34(21.9)		30(25.6)		4(10.5)
Presence of Arthritis ^g		50(32.3)		34(29.1)		16(42.1)
Fell past 30 days ^f		52(33.5)		36(30.8)		16(42.1)

Notes. All individual variable data from MDS: ^aage: measured in years; ^bValues calculated on MDS items for personal hygiene, toileting, locomotion, eating based on Morris, Fries, & Morris (1999). Scaling ADLs within the MDS. *Journal of Gerontology: MEDICAL SCIENCES*. 54a(11), M546-M553. ^cValues calculated from hierarchical scale based on 7 MDS items of comatose, short-term memory, decision making, eating, and making self understood, based on Morris, Fries, Mehr, Hawes, Phillips et al., MDS Cognitive Performance Scale *Journal of Gerontology MEDICAL SCIENCES*, 49(4), M174-M182. Details for all variables can be found in Appendix A.

TABLE 4: *Prevalence of Diagnosis in the Sample (N=155)*

Diagnosis	<i>n(%)</i>
Hypertension	54(35)
Falls in past 30 days	52(34)
Arthritis	50(32)
Depression	48(26)
Anemia	47(30)
Osteoporosis	38(25)
Congestive Heart Failure	36(23)
Cardiovascular Disease	34(22)
Hypothyroidism	32(21)
Dementia	27(17)
COPD	26(17)
Hip fracture	23(16)

Note. Top 12 Diagnoses from last Medicare Part A MDS based on frequency analysis. Counts reflect number of individuals with each diagnosis. Each record contains multiple diagnoses.

Facility Characteristics of the Sample

This study used data from a convenience sample of three Washington State nursing homes collected in a previous study (Crogan, Corbett & Short, 2002). All three nursing homes were located in an urban area. The facilities ranged in size from 75-145 beds. Two facilities were not-for-profit and one facility was for-profit. One facility was vertically integrated and one facility was a chain member. Table 5 lists facility characteristics included in the model.

TABLE 5: *Facility characteristics*

Characteristic	Facility 1	Facility 2	Facility 3
Size	75	125	145
Profitability status	Not-for-profit	For-Profit	Not-for-profit
Level of vertical integration	Vertically integrated	Not vertically integrated	Not Vertically integrated
Chain membership	Non-chain member	Chain member	Non-chain member

Discharge Outcomes

The MDS discharge tracking form was used to assess what happened to each resident after their Medicare Part A stay. The form contains specific information regarding the level of care when nursing home residents are discharged. A comprehensive list of codes from the MDS tracking form is located in the coding dictionary (See Appendix B). If there was no discharge tracking form available in the original data set, then it was assumed that the resident remained in the nursing home beyond the end of the initial study. All of the cases without a discharge tracking form had a state-required MDS following their last Medicare-required MDS. The presence of one or more state-required MDSs confirmed the assumption that those residents remained

in the nursing home after the Medicare Part A reimbursed stay. Residents who remained in the same nursing home were coded as “remained in the same nursing home” for the discharge outcome variable.

Frequencies of discharge outcomes for the total sample ($N=155$) and for residents in each facility are shown in table 12. Fifty-eight (29.7%) people were discharged to their home with or without home health services. Twenty (16.1%) went to board and care/assisted living while 4 (2.6%) went to another nursing facility. Twenty-four (16.1%) died while receiving Medicare Part A services, while 38 (11.6%) remained in the same nursing home.

TABLE 6: *Discharge Outcomes*

Discharge Status	Total (N=155)		Facility 1 (n=61)		Facility 2 (n=29)		Facility 3 (n=65)	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Private home/apt. with no home services	46	29.7	11	18.0	6	20.7	29	44.6
Private home/apt. with home health services	12	7.7	5	8.2	4	13.8	3	4.6
Board and care/assisted living	20	12.9	16	26.2	3	10.3	1	1.5
Another nursing facility	4	2.6	0	0	2	6.9	2	3.1
Acute care hospital	25	16.1	10	16.4	4	13.8	11	16.9
Psychiatric hospital	1	0.6	0	0.0	1	3.4	0	0
Deceased	2	15.5	8	13.1	7	24.1	9	13.8
Other	5	3.2	0	0	1	3.4	4	6.2
Stay in same nursing facility	18	11.6	11	18	1	3.4	6	9.2

Of the three facilities, Facility 1 (not-for-profit, non-chain, vertically integrated, size=75) had the highest percent ($n=11$, 18%) of residents remaining in the facility after their Medicare Part A stay ended. Facility 1 had over twice the percentage of discharges to assisted living ($n=16$, 26.2%) compared to the other 2 facilities and the fewest discharges home with or without home health ($n=16$, 26%).

Facility 2 (for-profit, chain member, no vertical integration, size=125) had the largest percentage of residents who died ($n=7$, 24.1%) and the fewest admissions to an

acute care hospital ($n=4$, 13.8%). Facility 2 had a relatively greater percentage of residents discharged to another nursing home ($n=2$, 6.9%). This facility discharged 34.5% of their residents to their home with or without home health services after the conclusion of their Medicare Part A stay ($n=10$).

Facility 3 (not-for-profit, non-chain, not vertically integrated, size=145) had the largest proportion of residents discharged home ($n=32$, 19.2%) and a small percentage of residents discharged to another nursing facility ($n=2$, 3.1%). Facility 3 discharged more residents to an acute care hospital ($n=11$, 16.9%) than any other facility (Facility 1: $n=10$, 16.4%, Facility 2: $n=4$, 13.8%).

Correlation Matrix

Although an examination of the bivariate relationship between the individual characteristics and facility characteristics is not the primary purpose of contextual regression, it does provide an opportunity to examine whether or not there is support for the early assumptions (Mark, Salyer, & Wan, 2000). A correlation matrix was created for selected variables using Statistical Program for the Social Sciences, (SPSS) student version 14.0 (SPSS, 2005). The Pearson correlation coefficient was used to determine the direction, magnitude and strength of correlations. Twenty variables and their Pearson's' correlations are listed in table 7. There was a statistical significant relationship for 30 of the correlations ($p<.05$). None of the significant correlations were larger than .54 and most were $> .25$.

TABLE 7: *Pearson Correlation Coefficients for Selected Variables*

	Gen-der	Race	Marital State	Age	ADL Score	CPS Score	Fell 30 days	De-pression	Pain
LOS	.08	-.11	.01	.12	.27	.27	.11	.09	-.18
Gender	-	.08	-.26*	.09	.05	-.02	.08	.12	.07
Race		-	.09	.04	-.22*	-.08	.10	-.12	-.03
Marital			-	-.11	-.16*	-.06	-.12	-.04	-.08
Age				-	.11	.19*	.08	-.05	-.12
ADL score					-	.54**	.07	.19*	.05
CPS score						-	.06	.20*	-.08
Fell 30							-	-.05	.15
Depres-sion								-	-.22.*
Pain									-
Restraint									
COPD									
Stg. I or II									
Stg. III or IV									
CV ds.									
Arthritis									
HPT									
Hip Fx.									
Anemia									
CHF									

Note. All variables are defined in the coding dictionary in Appendix C. * $p < .05$, ** $p < .01$

TABLE 7: *Pearson Correlation Coefficients for selected variables (cont'd)*

	Re- straint	CO PD	Stg. I or II	Stg. III, IV	CV	Arth- ritis	HPT	Hip fx.	Anem - ia	CHF
LOS	.17	.15	-.10	-.08	-.10	.13	.11	.20	.01	-.03
Gender	.00	-.08	.02	-.01	-.03	.06	.13	.04	-.00	-.07
Race	-. .23**	.07	-.12	-.24*	.07	-.10	.10	.06	.09	.08
Marital Status	-.08	-.06	-.10	-.04	.07	-.07	-.14*	.08	.07	-.18
Age	.04	-.03	-.18*	-.11	.03	.08	.16	.05	.08	.07
ADL score	.28**	-.03	.13*	.08	.07	.15*	.26*	.22	.12	.10
CPS score	.18*	-.14*	.09	-.16*	.04	.03	.16	.08	-.05	-.06
Fell 30	.03	.08	.06	-.05	.15*	.09	.14	.45*	.10	.13
Depre- s-sion	-.15	-.07*	-.06	.16*	.02	.00	.07	-.10	-.08	.19
Pain			.09	.06	.09	.16	-.03	.16*	-.02	-.05
Restr- aint			.11	.05	-.11	-.08	.04	-.06	.04	-.13
COP D			-.02	-.08	.05	.20	.07	.19	.19	.37*
Stg. I or II			-	.07	.05	.20	.07	.19*	-.01	-.07
Stg. III or IV				-	-.01	-.05	-.13	.02	-.12	-.10
CV ds.					-	.20	.10	.20	.26	.34
Arthri- tis						-	.19	.16	.26*	.18*
HPT							-	.02*	.08*	.34*
Hip fx.								-	.22	.34*
Anem ia									-	.30*
CHF										-

Note. All variables are defined in the coding dictionary in Appendix C. * $p < .05$, ** $p < .01$

The correlation of $r = .54$ ($p < .001$) between cognitive functioning (CPS score) and physical functioning (ADL score) suggests that residents with higher cognitive impairment were more likely to need assistance with physical functioning like bathing, dressing, and grooming. In addition, ADL score (more physical limitations) was

positively correlated with the presence of physical restraints ($r=.29, p<.05$) suggesting that residents with physical limitations were more likely to be restrained.

There were several significant correlations between individual variables and facility variables. For example, the diagnoses of COPD and CHF correlated with facility size (-.26, -.25). In a larger sample, such correlations might be indicative of the conditions of resident within that facility. However, correlations between individual characteristics and facility characteristics are not considered reliable in this sample, due to the small facility sample size. None of the correlations were so high as to suggest collinearity among the variables.

Contextual Regression

Contextual regression is a statistical strategy that uses multiple regressions to analyze the relationships of both individual and group characteristics with respect to an outcome of interest (Hozemer et al., 1999). Contextual regression is an important method for dealing with aggregate data and multiple units of analysis whereby groups of individuals such as nursing home residents are contained within a different level, i.e., facilities. Because the study model includes two levels of analysis contextual regression is an appropriate method for this analysis.

Contextual effects on groups can be analyzed using multiple linear regressions. A contextual facility-level effect on the length of stay would be evident if the regression model contains both individual and facility characteristics that explain a significantly greater variance than a regression model with only individual characteristics, or only facility characteristics (Mark, 2000). In this study, the initial regression individual

(block 1) and facility characteristics (block 2) were evaluated using the “enter” method of regression. In the second regression facility characteristics were entered first (block 1) and individual characteristics second (block 2) using the “enter” method.

In the first regression, the influence of individual characteristics (age, gender, marital status, race, ADL score, CPS score, presence of physical restraints, management of depressive symptoms, presence of pain, and presence of stage I-IV pressure ulcers) were examined alone. In this model, individual characteristics predicted 28% $F = 2.69$, $p = .000$) of the variance in total length of stay (see table 8). The individual characteristic of pain ($Std. \beta = -.22$, $p = .01$) and symptoms of depression ($Std. \beta = .18$, $p = .03$) without treatment were significant predictors. All regression coefficients can be seen in tables 9-12. When facility characteristics (facility size, facility level of vertical integration, facility profitability status and facility chain membership) were combined with individual characteristics in model 2, R^2 was essentially unchanged ($\Delta R^2 = .001$, $p = .003$). The overall model remained significant $F = 2.17$, $p < .01$. In other words, in this regression, facility characteristics did not significantly contribute to the variance of length of stay over and above individual characteristics.

In the second regression, facility characteristics (facility size, facility level of vertical integration, facility profitability status and facility chain membership) were entered in block 1 and individual characteristics (age, gender, marital status, race, ADL score, CPS score, presence of physical restraints, management of depressive symptoms, presence of pain, and presence of stage I-IV pressure ulcers) were entered in block 2. In this model, facility characteristics alone did not significantly predict variance in length of

stay $F=1.08, p=.37$. When individual characteristics were added to the model, the model predicted 28% of the variance in length of stay ($F= 2.17, p=.003$), suggesting that individual level predictors explain more of the variance in length of stay than facility predictors.

TABLE 8: *Summary of Contextual Regression Analysis for Individual^a and Facility^b Variables Predicting Total Length of Stay (N=155)*

		<i>df</i>	<i>F</i>	<i>R</i> ²	<i>p</i>
Block 1	1. Individual characteristics	19	2.69	.28	.000
Block 2	2. Individual and facility characteristics	23	2.17	.28	.003
Block 1	1. Facility characteristics	4	1.08	.03	.367
Block 2	2. Individual and facility characteristics	23	2.17	.17	.003

Note. ^aIndividual characteristics: age, gender, marital status, race, symptoms of depression with and without treatment, presence of physical restraints, presence of Stage I, II, III, or IV pressure ulcers, ADL score, CPS score, presence of pain. ^bFacility characteristics: size, profitability status, chain membership, level of vertical integration.

TABLE 9 *Influence of Individual^a and Facility^b Characteristics on Total Length of Stay: Model 1 Block 1 (N=155)*

	β	SE β	β	<i>t</i>	<i>sig.</i>
(constant)	63.89	103.91		.598	.55
Gender	20.21	16.37	.10	1.24	.22
Race	-51.87	90.79	-.07	-.85	.40
Marital	-5.29	19.13	-.02	-.28	.78
Pain	-46.59	17.34	-.22	-2.68	.01
Restraints	24.65	18.62	.11	1.32	.19
Age	-.09	1.05	-.01	-.09	.92
Fell in 30 days	12.85	18.35	.06	.70	.49
CPS score	11.33	6.53	.16	1.73	.09
ADL score	2.90	2.31	.13	1.26	.21
COPD	42.00	23.00	.16	1.83	.07
Pressure ulcer 1	-39.06	27.74	-.11	-1.41	.16
Pressure ulcer 3	-54.98	44.75	-.10	-1.23	.22
Depression	43.73	19.95	.18	2.19	.03
CV disease	-20.58	20.13	-.09	-1.02	.31
Arthritis	28.76	17.92	.14	1.61	.11
Hypertension	-1.90	18.16	-.01	-.11	.92
Hip Fracture	47.21	25.48	.17	1.85	.07
Anemia	-10.68	18.37	-.05	-.58	.56
CHF	-26.82	23.56	-.11	-1.14	.26

Note. ^aIndividual characteristics: age, gender, marital status, race, symptoms of depression with and without treatment, presence of physical restraints, presence of Stage I, II, III, or IV pressure ulcers, ADL score, CPS score, presence of pain. ^bFacility characteristics: size, profitability status, chain membership, level of vertical integration.

Table 10 *Influence of Individual^a and Facility^b Characteristics on Total Length of Stay: Model 1 Block 2 (N=155)*

	β	SE β	β	<i>t</i>	<i>sig.</i>
(constant)	110.41	12.10		.68	.50
Gender	20.21	17.08	.10	1.24	.23
Race	-51.87	61.68	-.07	-.84	.40
Marital	-4.98	19.85	-.02	-.26	.80
Pain	-48.28	18.14	-.23	-2.68	.01
Restraints	22.74	19.67	.10	1.15	.25
Age	-.19	1.10	-.02	-.18	.86
Fell in 30 days	12.78	18.78	.06	.68	.49
CPS score	11.21	6.63	.16	1.73	.09
ADL score	3.15	2.43	.14	1.30	.20
COPD	43.47	24.45	.16	1.78	.09
Pressure ulcer 1	-37.95	28.36	-.11	-1.34	.18
Pressure ulcer 3	-56.45	45.79	.10	-1.23	.22
Depression	44.77	20.54	.18	2.19	.03
CV disease	-18.10	21.57	-.08	-.84	.40
Arthritis	27.83	18.82	.13	1.49	.14
Hypertension	-.68	23.44	-.03	-.03	.97
Hip Fracture	48.75	26.37	.18	1.85	.07
Anemia	-8.33	20.50	-.04	-.41	.69
CHF	-26.93	23.56	-.11	-1.13	.26
Facsize	-.27	.78	-.09	-.34	.73
Facprofit	-15.99	109.00	-.06	-.15	.88
Facvert	-20.71	57.13	-.10	-.36	.72
Facchain	.69	99.07	.00	.00	.99

Note. ^aIndividual characteristics: age, gender, marital status, race, symptoms of depression with and without treatment, presence of physical restraints, presence of Stage I, II, III, or IV pressure ulcers, ADL score, CPS score, presence of pain. ^bFacility characteristics: size, profitability status, chain membership, and level of vertical integration.

TABLE 11: *Influence of Individual^a and Facility^b Characteristics on Total Length of Stay: Model 2 Block 1 (N=155)*

	β	$SE \beta$	β	t	$Sig.$
(Constant)	57.49	120.22		.48	.63
Facility size	-.10	.84	-.3	-.11	.91
Fac. profit	81.07	104.37	.32	.78	.44
Fac vertical	30.02	58.63	.15	.51	.61
Facility chain	-65.39	100.99	-.26	-.65	.52

Note. ^aIndividual characteristics: age, gender, marital status, race, symptoms of depression with and without treatment, presence of physical restraints, presence of Stage I, II, III, or IV pressure ulcers, ADL score, CPS score, presence of pain. ^bFacility characteristics: size, profitability status, chain membership, level of vertical integration.

TABLE 12 *Influence of Individual^a and Facility^b on Total Length of Stay: Model 2 Block 2 (N=155)*

	β	SE β	β	t	Sig.
(constant)	110.41	162.20		.68	.50
Facility size	-.27	.77	-.09	.34	.73
Facility profit	-16.00	109.00	-.06	-.15	.88
Facility vertical	-20.71	57.13	-.10	-.36	.72
Facility chain	.69	99.07	.00	.00	.80
Gender	20.69	17.08	.10	1.21	.23
Race	-51.66	61.68	-.07	-.84	.40
Marital status	-4.98	19.85	-.02	-.25	.80
Pain	-48.28	18.14	-.23	-2.66	.01
Restraints	22.73	19.67	.10	1.16	.25
Pressure ulcer	-32.91	28.36	-.08	-1.34	.20
Pressure ulcer	-46.46	42.79	.10	-1.22	.22
Age	-.19	1.10	-.02	-.18	.86
Fell 30 days	12.78	18.78	.06	.68	.50
CPS score	11.22	6.63	.16	1.69	.09
ADL score	3.15	2.43	.14	1.30	.20
Depression	44.77	20.54	.19	2.18	.03
CHF	-26.93	23.89	-.11	-1.3	.26
Hypertension	-.68	23.44	-.00	-.03	.98
CV Disease	-18.10	21.567	-.08	-.84	.40
Arthritis	27.83	18.72	.13	1.50	.14
Anemia	-8.33	20.50	-.04	-.41	.69
COPD	43.47	24.25	.16	1.78	.08
Hip fracture	48.75	26.37	.18	1.75	.07

Note. ^aIndividual characteristics: age, gender, marital status, race, symptoms of depression with and without treatment, presence of physical restraints, presence of Stage I, II, III, or IV pressure ulcers, ADL score, CPS score, presence of pain. ^bFacility characteristics: size, profitability status, chain membership, and level of vertical integration.

Contextual regression is concerned that all the criteria for linear models are met (Fields, 2000, Verran & Ferketich, 1987). Tests for normality, collinearity and homoscedascity were completed using a combination of scatter plots, histograms and statistical tests. Both contextual regressions all showed VIF values between 1 and 2, with the average VIF value near 1.0. There were very few large Eigen values and nearly all of the large values appeared to load on different dimensions. The variance

proportions of race (.74) and age (.78) both loaded on smaller Eigen values (third from the smallest) in the first regression model. VIF values were not substantially >1.0 . No tolerance statistic was below 0.3. Overall, it is safe to conclude that collinearity is probably not present.

Tests for normality of the variables showed mixed results. Only about half of the variables appeared to be normally distributed which may be a weakness of the study. Assumptions of parametric statistics are guidelines that are intended to be followed (Fields, 2000). However, in secondary data analysis, the researcher must use the data to the best of his/her ability. It was hoped that any violations of the assumptions for parametric tests in this analysis did not affect the statistical analysis or the number of errors made (Polit & Hunger, 1999).

Summary

The purpose of this study was to determine if there were both contextual and individual effects on the ability of older adults to transition from a nursing home after a Medicare Part A stay. Using contextual regression, the model is an overall fair predictor of length of stay. Individual characteristics contributed 28% to the variance in length of stay. Facility characteristics did not contribute to the model over and above individual characteristics. The descriptive statistics and correlations offer supplemental information for evaluation. The researcher's interpretation of these results follows.

CHAPTER SIX DISCUSSION

Introduction

A study model based on Resource Dependency Theory was developed to address certain questions related to the organizational impact of older adults living in nursing facilities. The cross-level model included individual resident characteristics; facility characteristics, length of stay and discharge outcomes. The aim of the study was to identify those factors that influenced older adults' ability to transition out of nursing homes after a rehabilitative stay. The hypotheses focused on whether there was both an individual and contextual effect on length of stay for older adults admitted to nursing facilities. The results of the study did not support the hypothesis. Possible explanations include mis-specification of the model or a problem with measurement.

Facility Characteristics

Even though the results showed nursing home facility characteristics did not significantly affect the variance in length of stay, there is reason to believe the facility characteristics chosen are appropriate. The failure of facility characteristics to contribute significantly to the model might be a problem of facility sample size ($n=3$). In previous larger samples, these variables have been significant predictors. For example, facility measurements such as ownership status, size, and profitability status were previously used to evaluate nursing facilities residents' outcomes such as restraints, pressure ulcers, and catheterization rate using large sample sizes (Harrington et al., 2000; 2001; Spector & Takada, 1991). Another study with 15,834 nursing homes used these same facility

characteristics to find significant differences in the performance among nursing homes (Castle & Banazak-Holl, 2003).

Facility characteristics failed to contribute significantly to the model, most likely due to the small number of facilities in the sample. If the facility sample size been larger, the hypothesis may have been supported. Facility characteristics in the study model remain an important consideration for future studies.

Individual Characteristics

CMS Eighth Scope initiative was one basis for selecting individual predictors in the study model. It was also thought that some of the reported rationale for custodial type nursing home admission might also predict length of stay in the post acute care population. Individual characteristics in the model were developed using both of these rationale. In the overall model, the individual characteristics explained 28% of the variance in length of stay ($p < .05$). This is considered a fair beginning for a model that has not been previously tested. Beta coefficients provide some idea about the relative contribution of each variable (Fields, 2000).

Beta coefficients that were significant contributors to length of stay were pain ($\beta = -.18$, $p < .05$), and symptoms of depression without treatment ($\beta = .22$, $p < .05$). The idea that untreated depression may be influencing the length of stay in the post acute population is not surprising. The under treatment of depression among older adults in nursing homes is well documented in the literature (Piven & Titler, 2001, Teresi et al., 2001) and is a concern of CMS' Eighth Scope Initiative (Arizona Quality, 2006; IFQHC, 2006). One plausible explanation for the fact that pain had a negative relationship with

length of stay may be the result of effective treatment of pain during the stay, or that residents with more painful problems, i.e., knee replacements were discharged more quickly.

The use of demographic indicators previously shown to predict custodial type nursing home admission did not make significant contributions to the explained variance. Bearing in mind that this analysis used the last Medicare MDS prior to transition and included the records of those who were discharged as well as those who remained, what is more likely is that the post acute population may be dissimilar to the custodial nursing home residents demographically. For example, none of the beta coefficients of age, gender, race or marital status were significantly related to length of stay nor were these variables significantly correlated with length of stay when analyzed using Pearson's correlations. Neither the beta coefficients nor the correlations were consistent with previous studies that have found gender and age correlated with custodial care nursing home admission (Jagger & Lindsay, 1997, Haan, 1997).

Results varied among physical functioning and cognitive functioning which have both been previously linked to custodial type nursing home admissions (Bharucha et al., 2004; Harris et al., 1989; Lee et al., 2001). It is surprising that the beta coefficient for cognition (CPS) did not contribute significantly to the explained variance, since poorer cognitive functioning was thought to be related to the failure to transition after a post acute stay. Even though ADL scores correlated significantly with CPS scores ($r=.54$, $p<.05$), and both correlated with length of stay ($r=.27$, $p<.001$ for both), neither beta coefficients made a significant contribution to the explained variance, although they are

both most likely contributing to the overall model. Other medical diagnoses that were modestly correlated with length of stay were hip fracture ($r=.20, p<.05$), arthritis, ($r=.13, p<.05$) COPD, ($r=.15, p<.05$) pain ($r=-.18, p<.05$), and restraints ($r=.02, p<.05$) and should be retained in the model for further testing. The beta values suggest that symptoms of depression without treatment may increase the risk of remaining in the nursing home after the Medicare Part A stay has ended. The beta values, however, should be interpreted with caution since contextual regression looks at the effect of each variable in the presence of all the others (Fields, 2000).

Other results imply that more model testing is needed. Many of the medical diagnoses selected for this initial model testing correlated with length of stay, suggesting they were appropriately selected for the model. Some of the individual characteristics may have been more significant with a larger and more diverse sample size. For example, the low number of minorities and pressure ulcers in the sample, made the evaluation of those variables inconclusive. Also, in this study there was only one resident in the facility after the Medicare Part A stay ended that was not a Medicaid resident, making the payer source variable irrelevant. Overall, the individual characteristics should be retained in the model for future testing.

Methodology

One goal of this dissertation was to develop a methodology for using MDS data so that it could be used to analyze the research questions. One of the benefits of working with a national data set such as the MDS is that methodologies developed within the study can be used in subsequent research. For example, the CPS and ADL scales were

previously developed from the MDS specifically for use in nursing home research. Their inclusion in this study adds support for their reliability and attests to their usefulness in research, since no single field of the MDS could have thoroughly captured either the cognitive or physical functioning concept.

Similarly, it is hoped that the methods developed in this study for measuring the various lengths of stay will be used in research. Lengths of stay offered include the Medicare Part A length of stay, the custodial length of stay after the Medicare Part A stay ended, and a length of stay that combines the two. The lengths of stay were based on the federal guidelines for MDS completion and should be generalizable to any MDS data set.

The nursing home MDS regulations contain strict specifications for sequencing and timing of MDS completion. These rules served as the basis for logical inferences as to which residents remained in the nursing home after the Medicare Part A stay ended. For example, several residents had no discharge tracking form, and hence, no discharge date. Rather than assuming all of these residents remained in the nursing home after their Medicare Part A stay ended, the sequence of their MDSs was examined. Their failure to discharge after the Medicare Part A stay was confirmed by the presence of a non-Medicare MDS following one or more Medicare-required MDSs,

Furthermore, “MDS logic” was also used to write the decision rules for imputing missing data. Using “MDS logic” was considered a more exact way of assigning missing data values rather than simply taking the mean score. This was particularly true in the case of variables with large standard deviations.

Limitations and Directions for Further Research

The framework proposed in chapter 2 is intended as a template from which the transitions of older adults experiencing a post acute stay in the nursing home can be studied. The framework also includes market factors that should be incorporated into subsequent studies regarding lengths of stay and other outcomes. Understanding more about the ability of older adults to transition from the nursing home after a Medicare Part A stay is not limited to evaluating their length of stay. Resident transitions could also be approached with different study designs. For example, the independent variables in the model could be used as a basis for evaluating differences between the residents that remained in the nursing home compared to those who were discharged. Another potential study would evaluate the impact of the study variables on discharge disposition (shaded concept in the model).

Implications for Nursing Research and Practice

Since the passage of the Balanced Budget Act of 1997, previous research regarding the post acute nursing home population has focused on access (Angelelli et al., 2002) and utilization (Yip et al, 2002). Some other studies have addressed the issues around hospital readmission after discharge (Anderson et al., 2005; Lin, 2000), but few, if any studies have addressed issues of transitions and specific care delivery systems for post acute nursing home residents. Given the unique nature of this cohort, more studies are needed to address their health needs and if and how contextual affects influence their health outcomes, including of course, their ability to transition after a Medicare reimbursed stay.

The federal regulations require that to qualify for skilled nursing services under the Medicare Part A program, older adults must meet technical requirements such as a 3-day hospital stay and have a need for physical, occupational or speech therapy or skilled nursing services such as IV therapy, wound care, assessment and monitoring of an acute medical condition and so forth. Older adults appear to be coming to the skilled nursing facility from the hospital “sicker and quicker”. For those who were admitted to the skilled nursing facility, 15.5% died while receiving care under the Medicare Part A benefit and 16.1% returned to the acute care hospital. Given that the goal of the post acute Medicare Part A benefit is rehabilitation, research is needed to determine why this is not the case in over 30% of the sample.

Previous studies have shown that staffing levels and staff mix in for-profit nursing home chains are associated with poorer quality of care (Harrington et al., 2000, 2001). Aiken et al. (2002) and McGillis-Hall et al. (2003) uncovered the benefits of lower RN to patient ratios and increased RN surveillance on patient outcomes in hospitals. Lower RN staffing levels in nursing homes may lead to untoward resident outcomes similar to what Aiken described as “failure to rescue” whereby early assessment and intervention by RNs significantly reduces patient mortality. Further inquiry into contextual effects should drill deeper into the “black box” (Lynn, 1996) of post acute care. Studying issues such as RN staffing, RN surveillance and RN education in post acute care will add to the body of nursing knowledge and subsequently inform the public.

Clinicians and nurse managers working in nursing homes must also familiarize themselves with the unique needs of the post acute population. The suggested

relationship of symptoms of depression without treatment and length of stay is a concern for clinical practice. Nurses should be aware that depression among older adults tends to be under assessed, under reported and therefore, under treated. Untreated depression may extend the length of stay, causing undue institutionalization for the older adults and increased costs to Medicare. Training material is available to address this concern in nursing practice (Piven & Titler, 2001).

Falls continue to be a concern among older adults. Nursing homes have developed fall prevention programs and implemented them over the past several years. Nurse Managers and clinicians have worked proactively to see that safer environments are provided for older adults in facilities. Nurse scientists have created protocols for fall prevention (Lyons, 2005); yet, 52(34%) of residents in the post acute sample had a fall within 30 days of admission and 23(16%) were admitted with a current diagnosis of hip fracture. Given the poor outcomes associated with falls, safety continues to be a concern in the care of older adults.

The medical diagnoses of hip fracture, arthritis, COPD, and the presence of pain were correlated with length of stay. Each of these conditions is potentially debilitating or life threatening. Consistency is needed to ensure that evidenced-based practice standards for the care of older adult are implemented to support timely and appropriate transitions once the Medicare Part A stay ends.

Conclusion

This study began with a desire to know more about the post acute population of older adults receiving rehabilitative services in skilled nursing facilities and to develop a

methodology for using MDS data in research. Of particular interest was their transitions at the end of the Medicare Part A stay. As a nursing home administrator, I had a personal interest in knowing what role the nursing facilities played in affecting smooth transitions for residents from the skilled nursing facility back to their prior residence; why some residents failed to transition from the nursing home to a different level of care; and, if this failure could be related to contextual factors, their health status or both. A framework based on Resource Dependency Theory was developed to help answer those questions.

From this framework, a study model specified the individual and facility level characteristics that would be used to determine the relationship between study variables and length of stay. Even though a larger sample size would have been optimal, the model fit the data fairly well and it was a reasonable first attempt at discovering more about the length of stay of the post acute residents in nursing homes. The study enlarged my skills at using MDS data and the methodologies developed can be used in research. Future studies will focus on model refinement by retesting the model with a larger sample size and the use of different study designs.

APPENDIX A
MINIMUM DATA SET (MDS) VERSION 2.0
(SECTIONS AA-W AND DISCHARGE TRACKING FORM)

Numeric Identifier: _____

MINIMUM DATA SET (MDS) — VERSION 2.0
FOR NURSING HOME RESIDENT ASSESSMENT AND CARE SCREENING

BASIC ASSESSMENT TRACKING FORM

SECTION AA. IDENTIFICATION INFORMATION

1. RESIDENT NAME [Ⓢ]	a. (First)	b. (Middle Initial)	c. (Last)	d. (R/S)																				
2. GENDER [Ⓢ]	1. Male 2. Female																							
3. BIRTHDATE [Ⓢ]	<table border="1"> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> <tr> <td align="center" colspan="3">Month</td> <td align="center" colspan="2">Day</td> <td align="center" colspan="5">Year</td> </tr> </table>														Month			Day		Year				
Month			Day		Year																			
4. RACE [Ⓢ] & ETHNICITY	1. American Indian/Alaskan Native 4. Hispanic 2. Asian/Pacific Islander 5. White, not of Hispanic origin 3. Black, not of Hispanic origin																							
6. SOCIAL SECURITY AND MEDICARE NUMBERS [Ⓢ] (C in 1 st box if non med. no.)	a. Social Security Number																							
	b. Medicare number (or comparable railroad insurance number)																							
8. FACILITY PROVIDER NO [Ⓢ]	a. State No.																							
	b. Federal No.																							
7. MEDICAID NO. 1-9 [Ⓢ] if pending, "W" if not a Medicaid recipient [Ⓢ]	<table border="1"> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> </table>																							
8. REASONS FOR ASSESSMENT	(Note—Other codes do not apply to this form)																							
	a. Primary reason for assessment 1. Admission assessment (required by day 14) 2. Annual assessment 3. Significant change in status assessment 4. Significant correction of prior full assessment 5. Quarterly review assessment 10. Significant correction of prior quarterly assessment 0. NONE OF ABOVE b. Codes for assessments required for Medicare PPS or the State 1. Medicare 5 day assessment 2. Medicare 30 day assessment 3. Medicare 60 day assessment 4. Medicare 90 day assessment 5. Medicare readmission/return assessment 6. Other state required assessment 7. Medicare 14 day assessment 8. Other Medicare required assessment																							

9. Signatures of Persons who Completed a Portion of the Accompanying Assessment or Tracking Form

I certify that the accompanying information accurately reflects resident assessment or tracking information for this resident and that I collected or coordinated collection of this information on the dates specified. To the best of my knowledge, this information was collected in accordance with applicable Medicare and Medicaid requirements. I understand that this information is used as a basis for ensuring that residents receive appropriate and quality care, and as a basis for payment from federal funds. I further understand that payment of such federal funds and continued participation in the government-funded health care programs is conditioned on the accuracy and truthfulness of this information, and that I may be personally subject to or may subject my organization to substantial criminal, civil, and/or administrative penalties for submitting false information. I also certify that I am authorized to submit this information by this facility on its behalf.

Signature and Title	Sections	Date
a.		
b.		
c.		
d.		
e.		
f.		
g.		
h.		
i.		
j.		
k.		
l.		

GENERAL INSTRUCTIONS

Complete this information for submission with all full and quarterly assessments (Admission, Annual, Significant Change, State or Medicare required assessments, or Quarterly Reviews, etc.)

Ⓢ = Key items for computerized resident tracking
 [] = When box blank, must enter number or letter [X] = When letter in box, check if condition applies

Resident _____

Numeric Identifier _____

MINIMUM DATA SET (MDS) — VERSION 2.0
FOR NURSING HOME RESIDENT ASSESSMENT AND CARE SCREENING

BACKGROUND (FACE SHEET) INFORMATION AT ADMISSION

SECTION AB. DEMOGRAPHIC INFORMATION

1. DATE OF ENTRY	Date the stay began. Note — Does not include readmission if record was closed at time of temporary discharge to hospital, etc. In such cases, use prior admission date <input type="text"/> — <input type="text"/> — <input type="text"/>
2. ADMITTED FROM (AT ENTRY)	1. Private home/apt. with no home health services 2. Private home/apt. with home health services 3. Board and care/assisted living/group home 4. Nursing home 5. Acute care hospital 6. Psychiatric hospital, MR/DD facility 7. Rehabilitation hospital 8. Other
3. LIVED ALONE (PRIOR TO ENTRY)	0. No 1. Yes 2. In other facility
4. ZIP CODE OF PRIOR PRIMARY RESIDENCE	<input type="text"/>
5. RESIDENTIAL HISTORY 5 YEARS PRIOR TO ENTRY	(Check all settings resident lived in during 5 years prior to date of entry given in item AB1 above) Prior stay at this nursing home Stay in other nursing home Other residential facility—board and care home, assisted living, group home MH/psychiatric setting MR/DD setting NONE OF ABOVE
6. LIFETIME OCCUPATION(S) [Put "I" between two occupations]	<input type="text"/>
7. EDUCATION (Highest Level Completed)	1. No schooling 2. 8th grade/less 3. 9-11 grades 4. High school 5. Technical or trade school 6. Some college 7. Bachelor's degree 8. Graduate degree
8. LANGUAGE	(Code for correct response) a. Primary Language 0. English 1. Spanish 2. French 3. Other b. If other, specify
9. MENTAL HEALTH HISTORY	Does resident's RECORD indicate any history of mental retardation, mental illness, or developmental disability problem? 0. No 1. Yes
10. CONDITIONS RELATED TO MR/DD STATUS	(Check all conditions that are related to MR/DD status that were manifested before age 22, and are likely to continue indefinitely) Not applicable—no MR/DD (Skip to AB11) MR/DD with organic condition Down's syndrome Autism Epilepsy Other organic condition related to MR/DD MR/DD with no organic condition
11. DATE BACK-GROUND INFORMATION COMPLETED	<input type="text"/> — <input type="text"/> — <input type="text"/>

SECTION AC. CUSTOMARY ROUTINE

1. CUSTOMARY ROUTINE	(Check all that apply. If all information UNKNOWN, check last box only)
(In year prior to DATE OF ENTRY to this nursing home, or year last in community if now being admitted from another nursing home)	
CYCLE OF DAILY EVENTS	
Stays up late at night (e.g., after 9 pm)	a.
Naps regularly during day (at least 1 hour)	b.
Goes out 1+ days a week	c.
Stays busy with hobbies, reading, or fixed daily routine	d.
Spends most of time alone or watching TV	e.
Moves independently indoors (with appliances, if used)	f.
Use of tobacco products at least daily	g.
NONE OF ABOVE	h.
EATING PATTERNS	
Distinct food preferences	i.
Eats between meals all or most days	j.
Use of alcoholic beverage(s) at least weekly	k.
NONE OF ABOVE	l.
ADL PATTERNS	
In bedclothes much of day	m.
Wakens to toilet all or most nights	n.
Has irregular bowel movement pattern	o.
Showers for bathing	p.
Bathing in PM	q.
NONE OF ABOVE	r.
INVOLVEMENT PATTERNS	
Daily contact with relatives/close friends	s.
Usually attends church, temple, synagogue (etc.)	t.
Finds strength in faith	u.
Daily animal companion/presence	v.
Involved in group activities	w.
NONE OF ABOVE	x.
UNKNOWN—Resident/family unable to provide information	y.

SECTION AD. FACE SHEET SIGNATURES

SIGNATURES OF PERSONS COMPLETING FACE SHEET:		
a. Signature of RN Assessment Coordinator		Date
I certify that the accompanying information accurately reflects resident assessment or tracking information for this resident and that I collected or coordinated collection of this information on the dates specified. To the best of my knowledge, this information was collected in accordance with applicable Medicare and Medicaid requirements. I understand that this information is used as a basis for ensuring that residents receive appropriate and quality care, and as a basis for payment from federal funds. I further understand that payment of such federal funds and continued participation in the government-funded health care programs is conditioned on the accuracy and truthfulness of this information, and that I may be personally subject to or may subject my organization to substantial criminal, civil, and/or administrative penalties for submitting false information. I also certify that I am authorized to submit this information by this facility on its behalf.		
Signature and Title	Sections	Date
b.		
c.		
d.		
e.		
f.		
g.		

= When box blank, must enter number or letter = When letter in box, check if condition applies

Resident _____ Numeric Identifier _____

MINIMUM DATA SET (MDS) — VERSION 2.0
FOR NURSING HOME RESIDENT ASSESSMENT AND CARE SCREENING
FULL ASSESSMENT FORM

(Status in last 7 days, unless other time frame indicated)

SECTION A. IDENTIFICATION AND BACKGROUND INFORMATION

1. RESIDENT NAME	a. (First) _____ b. (Middle Initial) _____ c. (Last) _____ d. (Jr/Sr) _____
2. ROOM NUMBER	_____
3. ASSESSMENT REFERENCE DATE	a. Last day of MDS observation period _____ / _____ / _____ Month Day Year b. Original (0) or corrected copy of form (enter number of correction) _____
4a. DATE OF REENTRY	Date of reentry from most recent temporary discharge to a hospital in last 90 days (or since last assessment or admission if less than 90 days) _____ / _____ / _____ Month Day Year
5. MARITAL STATUS	1. Never married 3. Widowed 5. Divorced 2. Married 4. Separated
6. MEDICAL RECORD NO.	_____
7. CURRENT PAYMENT SOURCES FOR N.H. STAY	(Billing Office to indicate; check all that apply in last 30 days) Medicaid per diem a. VA per diem f. _____ Medicare per diem b. Self or family pays for full per diem g. _____ Medicare ancillary part A c. Medicaid resident liability or Medicare co-payment h. _____ Medicare ancillary part B d. Private insurance per diem (including co-payment) i. _____ CHAMPUS per diem e. Other per diem j. _____
8. REASONS FOR ASSESSMENT	a. Primary reason for assessment 1. Admission assessment (required by day 14) 2. Annual assessment 3. Significant change in status assessment 4. Significant correction of prior full assessment 5. Quarterly review assessment 6. Discharged—return not anticipated 7. Discharged—return anticipated 8. Discharged prior to completing initial assessment 9. Reentry 10. Significant correction of prior quarterly assessment 0. NONE OF ABOVE b. Codes for assessments required for Medicare PPS or the State 1. Medicare 5 day assessment 2. Medicare 30 day assessment 3. Medicare 60 day assessment 4. Medicare 90 day assessment 5. Medicare readmission/return assessment 6. Other state required assessment 7. Medicare 14 day assessment 8. Other Medicare required assessment
9. RESPONSIBILITY/LEGAL GUARDIAN	(Check all that apply) Durable power attorney/financial _____ d. _____ Legal guardian a. Family member responsible e. _____ Other legal oversight b. Patient responsible for self f. _____ Durable power of attorney/health care c. NONE OF ABOVE g. _____
10. ADVANCED DIRECTIVES	(For those items with supporting documentation in the medical record, check all that apply) Living will a. Feeding restrictions f. _____ Do not resuscitate b. Medication restrictions g. _____ Do not hospitalize c. Other treatment restrictions h. _____ Organ donation d. _____ Autopsy request e. NONE OF ABOVE i. _____

SECTION B. COGNITIVE PATTERNS

1. COMATOSE	(Persistent vegetative state/no discernible consciousness) 0. No 1. Yes (If yes, skip to Section G)
2. MEMORY	Recall of what was learned or known a. Short-term memory OK—seems/appears to recall after 5 minutes 0. Memory OK 1. Memory problem b. Long-term memory OK—seems/appears to recall long past 0. Memory OK 1. Memory problem

3. MEMORY/RECALL ABILITY	(Check all that resident was normally able to recall during last 7 days) Current season a. _____ Location of own room b. _____ That he/she is in a nursing home d. _____ Staff names/faces c. _____ NONE OF ABOVE are recalled e. _____
4. COGNITIVE SKILLS FOR DAILY DECISION-MAKING	(Made decisions regarding tasks of daily life) 0. INDEPENDENT—decisions consistent/reasonable 1. MODIFIED INDEPENDENCE—some difficulty in new situations only 2. MODERATELY IMPAIRED—decisions poor; cues/supervision required 3. SEVERELY IMPAIRED—never/ rarely made decisions
5. INDICATORS OF DELIRIUM—PERIODIC DISORDERED THINKING/AWARENESS	(Code for behavior in the last 7 days.) [Note: Accurate assessment requires conversations with staff and family who have direct knowledge of resident's behavior over this time]. 0. Behavior not present 1. Behavior present, not of recent onset 2. Behavior present, over last 7 days appears different from resident's usual functioning (e.g., new onset or worsening) a. EASILY DISTRACTED—(e.g., difficulty paying attention; gets sidetracked) b. PERIODS OF ALTERED PERCEPTION OR AWARENESS OF SURROUNDINGS—(e.g., moves lips or talks to someone not present; believes he/she is somewhere else; confuses night and day) c. EPISODES OF DISORGANIZED SPEECH—(e.g., speech is incoherent, nonsensical, irrelevant, or rambling from subject to subject; loses train of thought) d. PERIODS OF RESTLESSNESS—(e.g., fidgeting or picking at skin, clothing, napkins, etc; frequent position changes; repetitive physical movements or calling out) e. PERIODS OF LETHARGY—(e.g., sluggishness; staring into space; difficult to arouse; little body movement) f. MENTAL FUNCTION VARIES OVER THE COURSE OF THE DAY—(e.g., sometimes better, sometimes worse; behaviors sometimes present, sometimes not)
6. CHANGE IN COGNITIVE STATUS	Resident's cognitive status, skills, or abilities have changed as compared to status of 90 days ago (or since last assessment if less than 90 days) 0. No change 1. Improved 2. Deteriorated

SECTION C. COMMUNICATION/HEARING PATTERNS

1. HEARING	(With hearing appliance, if used) 0. HEARS ADEQUATELY—normal talk, TV, phone 1. MINIMAL DIFFICULTY when not in quiet setting 2. HEARS IN SPECIAL SITUATIONS ONLY—speaker has to adjust tonal quality and speak distinctly 3. HIGHLY IMPAIRED/absence of useful hearing
2. COMMUNICATION DEVICES/TECHNIQUES	(Check all that apply during last 7 days) Hearing aid, present and used Hearing aid, present and not used regularly Other receptive comm. techniques used (e.g., lip reading) NONE OF ABOVE
3. MODES OF EXPRESSION	(Check all used by resident to make needs known) Speech Signs/gestures/sounds Writing messages to express or clarify needs Communication board Other American sign language or Braille NONE OF ABOVE
4. MAKING SELF UNDERSTOOD	(Expressing information content—however able) 0. UNDERSTOOD 1. USUALLY UNDERSTOOD—difficulty finding words or finishing thoughts 2. SOMETIMES UNDERSTOOD—ability is limited to making concrete requests 3. RARELY/NEVER UNDERSTOOD
5. SPEECH CLARITY	(Code for speech in the last 7 days) 0. CLEAR SPEECH—distinct, intelligible words 1. UNCLEAR SPEECH—slurred, mumbled words 2. NO SPEECH—absence of spoken words
6. ABILITY TO UNDERSTAND OTHERS	(Understanding verbal information content—however able) 0. UNDERSTANDS 1. USUALLY UNDERSTANDS—may miss some part/intent of message 2. SOMETIMES UNDERSTANDS—responds adequately to simple, direct communication 3. RARELY/NEVER UNDERSTANDS
7. CHANGE IN COMMUNICATION/HEARING	Resident's ability to express, understand, or hear information has changed as compared to status of 90 days ago (or since last assessment if less than 90 days) 0. No change 1. Improved 2. Deteriorated

☐ = When box blank, must enter number or letter a. = When letter in box, check if condition applies

Resident _____
SECTION D. VISION PATTERNS

1. VISION	(Ability to see in adequate light and with glasses if used) 0. ADEQUATE —sees fine detail, including regular print in newspapers/books 1. IMPAIRED —sees large print, but not regular print in newspapers/books 2. MODERATELY IMPAIRED —limited vision; not able to see newspaper headlines, but can identify objects 3. HIGHLY IMPAIRED —object identification in question, but eyes appear to follow objects 4. SEVERELY IMPAIRED —no vision or sees only light, colors, or shapes; eyes do not appear to follow objects	
2. VISUAL LIMITATIONS/DIFFICULTIES	Side vision problems—decreased peripheral vision (e.g., leaves food on one side of tray; difficulty traveling, bumps into people and objects, misjudges placement of chair when seating self) Experiences any of the following: sees halos or rings around lights; sees flashes of light; sees "curtains" over eyes NONE OF ABOVE	a. b. c.
3. VISUAL APPLIANCES	Glasses; contact lenses; magnifying glass 0. No 1. Yes	

SECTION E. MOOD AND BEHAVIOR PATTERNS

1. INDICATORS OF DEPRESSION, ANXIETY, SAD MOOD	(Code for indicators observed in last 30 days, irrespective of the assumed cause) 0. Indicator not exhibited in last 30 days 1. Indicator of this type exhibited up to five days a week 2. Indicator of this type exhibited daily or almost daily (6, 7 days a week)	
	VERBAL EXPRESSIONS OF DISTRESS a. Resident made negative statements—e.g., "Nothing matters; Would rather be dead; What's the use; Regrets having lived so long; Let me die" b. Repetitive questions—e.g., "Where do I go; What do I do?" c. Repetitive verbalizations—e.g., calling out for help, ("God help me") d. Persistent anger with self or others—e.g., easily annoyed, anger at placement in nursing home; anger at care received e. Self deprecation—e.g., "I am nothing; I am of no use to anyone" f. Expressions of what appear to be unrealistic fears—e.g., fear of being abandoned, left alone, being with others g. Recurrent statements that something terrible is about to happen—e.g., believes he or she is about to die, have a heart attack	h. Repetitive health complaints—e.g., persistently seeks medical attention, obsessive concern with body functions i. Repetitive anxious complaints/concerns (non-health related) e.g., persistently seeks attention/reassurance regarding schedules, meals, laundry, clothing, relationship issues j. Unpleasant mood in morning k. Insomnia/change in usual sleep pattern l. Sad, pained, worried facial expressions—e.g., furrowed brows m. Crying, tearfulness n. Repetitive physical movements—e.g., pacing, hand wringing, restlessness, fidgeting, picking
	SLEEP-CYCLE ISSUES SAD, APATHETIC, ANXIOUS APPEARANCE LOSS OF INTEREST o. Withdrawal from activities of interest—e.g., no interest in long standing activities or being with family/friends p. Reduced social interaction	
2. MOOD PERSISTENCE	One or more indicators of depressed, sad or anxious mood were not easily altered by attempts to "cheer up", console, or reassure the resident over last 7 days 0. No mood indicators 1. Indicators present, easily altered 2. Indicators present, not easily altered	
3. CHANGE IN MOOD	Resident's mood status has changed as compared to status of 90 days ago (or since last assessment if less than 90 days) 0. No change 1. Improved 2. Deteriorated	
4. BEHAVIORAL SYMPTOMS	(A) Behavioral symptom frequency in last 7 days 0. Behavior not exhibited in last 7 days 1. Behavior of this type occurred 1 to 3 days in last 7 days 2. Behavior of this type occurred 4 to 6 days, but less than daily 3. Behavior of this type occurred daily (B) Behavioral symptom alterability in last 7 days 0. Behavior not present OR behavior was easily altered 1. Behavior was not easily altered	(A) (B)
	a. WANDERING (moved with no rational purpose, seemingly oblivious to needs or safety) b. VERBALLY ABUSIVE BEHAVIORAL SYMPTOMS (others were threatened, screamed at, cursed at) c. PHYSICALLY ABUSIVE BEHAVIORAL SYMPTOMS (others were hit, shoved, scratched, sexually abused) d. SOCIALLY INAPPROPRIATE/DISRUPTIVE BEHAVIORAL SYMPTOMS (made disruptive sounds, noisiness, screaming, self-abusive acts, sexual behavior or disturbing in public, smeared/throw food/feeces, hoarding, rummaged through others' belongings) e. RESISTS CARE (resisted taking medications/ injections, ADL assistance, or eating)	

Numeric Identifier _____

5. CHANGE IN BEHAVIORAL SYMPTOMS	Resident's behavior status has changed as compared to status of 90 days ago (or since last assessment if less than 90 days) 0. No change 1. Improved 2. Deteriorated	
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SECTION F. PSYCHOSOCIAL WELL-BEING

1. SENSE OF INITIATIVE/INVOLVEMENT	At ease interacting with others At ease doing planned or structured activities At ease doing self-initiated activities Establishes own goals Pursues involvement in life of facility (e.g., makes/keeps friends; involved in group activities; responds positively to new activities; assists at religious services) Accepts invitations into most group activities NONE OF ABOVE	a. b. c. d. e. f. g.
2. UNSETTLED RELATIONSHIPS	Covert/open conflict with or repeated criticism of staff Unhappy with roommate Unhappy with residents other than roommate Openly expresses conflict/anger with family/friends Absence of personal contact with family/friends Recent loss of close family member/friend Does not adjust easily to change in routines NONE OF ABOVE	a. b. c. d. e. f. g. h.
3. PAST ROLES	Strong identification with past roles and life status Expresses sadness/anger/empty feeling over lost roles/status Resident perceives that daily routine (customary routine, activities) is very different from prior pattern in the community NONE OF ABOVE	a. b. c. d.

SECTION G. PHYSICAL FUNCTIONING AND STRUCTURAL PROBLEMS

1. (A) ADL SELF-PERFORMANCE —(Code for resident's PERFORMANCE OVER ALL SHIFTS during last 7 days—Not including setup)	0. INDEPENDENT —No help or oversight—OR— Help/oversight provided only 1 or 2 times during last 7 days 1. SUPERVISION —Oversight, encouragement or cueing provided 3 or more times during last 7 days—OR— Supervision (3 or more times) plus physical assistance provided only 1 or 2 times during last 7 days 2. LIMITED ASSISTANCE —Resident highly involved in activity; received physical help in guided maneuvering of limbs or other nonweight bearing assistance 3 or more times—OR—More help provided only 1 or 2 times during last 7 days 3. EXTENSIVE ASSISTANCE —While resident performed part of activity, over last 7-day period, help of following type(s) provided 3 or more times: —Weight-bearing support — Full staff performance during part (but not all) of last 7 days 4. TOTAL DEPENDENCE —Full staff performance of activity during entire 7 days 8. ACTIVITY DID NOT OCCUR during entire 7 days	
(B) ADL SUPPORT PROVIDED —(Code for MOST SUPPORT PROVIDED OVER ALL SHIFTS during last 7 days; code regardless of resident's self-performance classification)	0. No setup or physical help from staff 1. Setup help only 2. One person physical assist 3. Two+ persons physical assist	(A) (B) SELF-PERF SUPPORT
a. BED MOBILITY	How resident moves to and from lying position, turns side to side, and positions body while in bed	
b. TRANSFER	How resident moves between surfaces—to/from: bed, chair, wheelchair, standing position (EXCLUDE to/from bath/toilet)	
c. WALK IN ROOM	How resident walks between locations in his/her room	
d. WALK IN CORRIDOR	How resident walks in corridor on unit	
e. LOCOMOTION ON UNIT	How resident moves between locations in his/her room and adjacent corridor on same floor. If in wheelchair, self-sufficiency once in chair	
f. LOCOMOTION OFF UNIT	How resident moves to and returns from off unit locations (e.g., areas set aside for dining, activities, or treatments). If facility has only one floor, how resident moves to and from distant areas on the floor. If in wheelchair, self-sufficiency once in chair	
g. DRESSING	How resident puts on, fastens, and takes off all items of street clothing, including donning/removing prosthesis	
h. EATING	How resident eats and drinks (regardless of skill). Includes intake of nourishment by other means (e.g., tube feeding, total parenteral nutrition)	
i. TOILET USE	How resident uses the toilet room (or commode, bedpan, urinal); transfer on/off toilet, cleanses, changes pad, manages ostomy or catheter, adjusts clothes	
j. PERSONAL HYGIENE	How resident maintains personal hygiene, including combing hair, brushing teeth, shaving, applying makeup, washing/drying face, hands, and perineum (EXCLUDE baths and showers)	

Resident _____

2. BATHING	How resident takes full-body bath/shower, sponge bath, and transfers in/out of tub/shower (EXCLUDE washing of back and hair). Code for most dependent in self-performance and support. (A) BATHING SELF-PERFORMANCE codes appear below 0. Independent—No help provided 1. Supervision—Oversight help only 2. Physical help limited to transfer only 3. Physical help in part of bathing activity 4. Total dependence 5. Activity itself did not occur during entire 7 days (Bathing support codes are as defined in Item 1, code B above)	(A) (B)
3. TEST FOR BALANCE (see training manual)	(Code for ability during test in the last 7 days) 0. Maintained position as required in test 1. Unsteady, but able to rebalance self without physical support 2. Partial physical support during test, or stands (sits) but does not follow directions for test 3. Not able to attempt test without physical help a. Balance while standing b. Balance while sitting—position, trunk control	
4. FUNCTIONAL LIMITATION IN RANGE OF MOTION (see training manual)	(Code for limitations during last 7 days that interfered with daily functions or placed resident at risk of injury) (A) RANGE OF MOTION 0. No limitation 1. Limitation on one side 2. Limitation on both sides (B) VOLUNTARY MOVEMENT 0. No loss 1. Partial loss 2. Full loss a. Neck b. Arm—including shoulder or elbow c. Hand—including wrist or fingers d. Leg—including hip or knee e. Foot—including ankle or toes f. Other limitation or loss	(A) (B)
5. MODES OF LOCOMOTION	(Check all that apply during last 7 days) Cane/walker/crutch Wheeled self Other person wheeled a. Wheelchair primary mode of locomotion b. NONE OF ABOVE	d. e.
6. MODES OF TRANSFER	(Check all that apply during last 7 days) Beofast all or most of time Bed rails used for bed mobility or transfer Lifted manually a. Lifted mechanically b. Transfer aid (e.g., slide board, trapeze, cane, walker, brace) c. NONE OF ABOVE	d. e. f.
7. TASK SEGMENTATION	Some or all of ADL activities were broken into subtasks during last 7 days so that resident could perform them 0. No 1. Yes	
8. ADL FUNCTIONAL REHABILITATION POTENTIAL	Resident believes he/she is capable of increased independence in at least some ADLs Direct care staff believe resident is capable of increased independence in at least some ADLs Resident able to perform tasks/activity but is very slow Difference in ADL Self-Performance or ADL Support, comparing mornings to evenings NONE OF ABOVE	a. b. c. d. e.
9. CHANGE IN ADL FUNCTION	Resident's ADL self-performance status has changed as compared to status of 90 days ago (or since last assessment if less than 90 days) 0. No change 1. Improved 2. Deteriorated	

SECTION H. CONTINENCE IN LAST 14 DAYS

1. CONTINENCE SELF-CONTROL CATEGORIES (Code for resident's PERFORMANCE OVER ALL SHIFTS)	0. CONTINENT—Complete control (includes use of indwelling urinary catheter or ostomy device that does not leak urine or stool) 1. USUALLY CONTINENT—BLADDER, incontinent episodes once a week or less; BOWEL, less than weekly 2. OCCASIONALLY INCONTINENT—BLADDER, 2 or more times a week but not daily; BOWEL, once a week 3. FREQUENTLY INCONTINENT—BLADDER, tended to be incontinent daily, but some control present (e.g., on day shift); BOWEL, 2-3 times a week 4. INCONTINENT—Had inadequate control BLADDER, multiple daily episodes; BOWEL, all (or almost all) of the time
a. BOWEL CONTINENCE	Control of bowel movement, with appliance or bowel continence programs, if employed
b. BLADDER CONTINENCE	Control of urinary bladder function (if dribbles, volume insufficient to soak through underpants), with appliances (e.g., Foley) or continence programs, if employed
2. BOWEL ELIMINATION PATTERN	Bowel elimination pattern regular—at least one movement every three days a. Diarrhea b. Fecal impaction c. NONE OF ABOVE

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3. APPLIANCES AND PROGRAMS	Any scheduled toileting plan Bladder retraining program External (condom) catheter Indwelling catheter Intermittent catheter	a. Did not use toilet room/commode/urinal b. Pads/briefs used c. Enemas/irrigation d. Ostomy present e. NONE OF ABOVE	f. g. h. i. j.
4. CHANGE IN URINARY CONTINENCE	Resident's urinary continence has changed as compared to status of 90 days ago (or since last assessment if less than 90 days) 0. No change 1. Improved 2. Deteriorated		

SECTION I. DISEASE DIAGNOSES

Check only those diseases that have a relationship to current ADL status, cognitive status, mood and behavior status, medical treatments, nursing monitoring, or risk of death. (Do not list inactive diagnoses)

1. DISEASES (If none apply, CHECK the NONE OF ABOVE box)	ENDOCRINE/METABOLIC/NUTRITIONAL Diabetes mellitus Hyperthyroidism Hypothyroidism HEART/CIRCULATION Arteriosclerotic heart disease (ASHD) Cardiac dysrhythmias Congestive heart failure Deep vein thrombosis Hypertension Hypotension Peripheral vascular disease Other cardiovascular disease MUSCULOSKELETAL Arthritis Hip fracture Missing limb (e.g., amputation) Osteoporosis Pathological bone fracture NEUROLOGICAL Alzheimer's disease Aphasia Cerebral palsy Cerebrovascular accident (stroke) Dementia other than Alzheimer's disease	Hemiplegia/Hemiparesis Multiple sclerosis Paraplegia Parkinson's disease Quadriplegia Seizure disorder Transient ischemic attack (TIA) Traumatic brain injury PSYCHIATRIC/MOOD Anxiety disorder Depression Manic depression (bipolar disease) Schizophrenia PULMONARY Asthma Emphysema/COPD SENSORY Cataracts Diabetic retinopathy Glaucoma Macular degeneration OTHER Allergies Anemia Cancer Renal failure NONE OF ABOVE	v. w. x. y. z. aa. bb. cc. dd. ee. ff. gg. hh. ii. jj. kk. ll. mm. nn. oo. pp. qq. rr.
2. INFECTIONS (If none apply, CHECK the NONE OF ABOVE box)	Antibiotic resistant infection (e.g., Methicillin resistant staph) Clostridium difficile (c. diff.) Conjunctivitis HIV infection Pneumonia Respiratory infection	Septicemia Sexually transmitted diseases Tuberculosis Urinary tract infection in last 30 days Viral hepatitis Wound infection NONE OF ABOVE	g. h. i. j. k. l. m.
3. OTHER CURRENT OR MORE DETAILED DIAGNOSES AND ICD-9 CODES	a. _____ b. _____ c. _____ d. _____ e. _____		

SECTION J. HEALTH CONDITIONS

1. PROBLEM CONDITIONS (Check all problems present in last 7 days unless other time frame is indicated)	INDICATORS OF FLUID STATUS Weight gain or loss of 3 or more pounds within a 7 day period Inability to lie flat due to shortness of breath Dehydrated; output exceeds input Insufficient fluid; did NOT consume all/almost all liquids provided during last 3 days OTHER Delusions	Dizziness/Vertigo Edema Fever Hallucinations Internal bleeding Recurrent lung aspirations in last 90 days Shortness of breath Syncope (fainting) Unsteady gait Vomiting NONE OF ABOVE	f. g. h. i. j. k. l. m. n. o. p.
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Resident _____		Numeric Identifier _____	
2. PAIN SYMPTOMS	(Code the highest level of pain present in the last 7 days) a. FREQUENCY with which resident complains or shows evidence of pain 0. No pain (skip to J4) 1. Pain less than daily 2. Pain daily	b. INTENSITY of pain 1. Mild pain 2. Moderate pain 3. Times when pain is horrible or excruciating	
3. PAIN SITE	(If pain present, check all sites that apply in last 7 days) Back pain Bone pain Chest pain while doing usual activities Headache Hip pain	a. Incisional pain b. Joint pain (other than hip) c. Soft tissue pain (e.g., lesion, muscle) d. Stomach pain e. Other	f. g. h. i. j.
4. ACCIDENTS	(Check all that apply) Fell in past 30 days Fell in past 31-180 days	a. Hip fracture in last 180 days b. Other fracture in last 180 days c. NONE OF ABOVE	c. d. e.
5. STABILITY OF CONDITIONS	Conditions/diseases make resident's cognitive, ADL, mood or behavior patterns unstable—(fluctuating, precarious, or deteriorating) Resident experiencing an acute episode or a flare-up of a recurrent or chronic problem End-stage disease, 6 or fewer months to live NONE OF ABOVE		a. b. c. d.

SECTION K. ORAL/NUTRITIONAL STATUS

1. ORAL PROBLEMS	Chewing problem Swallowing problem Mouth pain NONE OF ABOVE	a. b. c. d.
2. HEIGHT AND WEIGHT	Record (a.) height in inches and (b.) weight in pounds. Base weight on most recent measure in last 30 days; measure weight consistently in accord with standard facility practice—e.g., in a.m. after voiding, before meal, with shoes off, and in nightclothes	a. HT (in.) [][] b. WT (lb.) [][]
3. WEIGHT CHANGE	a. Weight loss—5% or more in last 30 days; or 10% or more in last 180 days 0. No 1. Yes b. Weight gain—5% or more in last 30 days; or 10% or more in last 180 days 0. No 1. Yes	
4. NUTRITIONAL PROBLEMS	Complains about the taste of many foods Regular or repetitive complaints of hunger	a. Leaves 25% or more of food uneaten at most meals b. NONE OF ABOVE
5. NUTRITIONAL APPROACHES	(Check all that apply in last 7 days) Parenteral/IV Feeding tube Mechanically altered diet Syringe (oral feeding) Therapeutic diet	a. Dietary supplement between meals b. Plate guard, stabilized built-up utensil, etc. c. On a planned weight change program d. NONE OF ABOVE
6. PARENTERAL OR ENTERAL INTAKE	(Skip to Section L if neither 5a nor 5b is checked) a. Code the proportion of total calories the resident received through parenteral or tube feedings in the last 7 days 0. None 1. 1% to 25% 2. 26% to 50% 3. 51% to 75% 4. 76% to 100% b. Code the average fluid intake per day by IV or tube in last 7 days 0. None 1. 1 to 500 cc/day 2. 501 to 1000 cc/day 3. 1001 to 1500 cc/day 4. 1501 to 2000 cc/day 5. 2001 or more cc/day	

SECTION L. ORAL/DENTAL STATUS

1. ORAL STATUS AND DISEASE PREVENTION	Debris (soft, easily movable substances) present in mouth prior to going to bed at night Has dentures or removable bridge Some/all natural teeth lost—does not have or does not use dentures (or partial plates) Broken, loose, or carious teeth Inflamed gums (gingivitis); swollen or bleeding gums; oral abscesses; ulcers or rashes Daily cleaning of teeth/dentures or daily mouth care—by resident or staff NONE OF ABOVE	a. b. c. d. e. f. g.
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SECTION M. SKIN CONDITION

1. ULCERS (Due to any cause)	(Record the number of ulcers at each ulcer stage—regardless of cause. If none present at a stage, record "0" (zero). Code all that apply during last 7 days. Code 0 = 0 or more.) [Requires full body exam.]	Number at Stage
	a. Stage 1. A persistent area of skin redness (without a break in the skin) that does not disappear when pressure is relieved. b. Stage 2. A partial thickness loss of skin layers that presents clinically as an abrasion, blister, or shallow crater. c. Stage 3. A full thickness of skin is lost, exposing the subcutaneous tissues - presents as a deep crater with or without undermining adjacent tissue. d. Stage 4. A full thickness of skin and subcutaneous tissue is lost, exposing muscle or bone.	
2. TYPE OF ULCER	(For each type of ulcer, code for the highest stage in the last 7 days using scale in item M1—i.e., 0=none; stages 1, 2, 3, 4) a. Pressure ulcer—any lesion caused by pressure resulting in damage of underlying tissue b. Stasis ulcer—open lesion caused by poor circulation in the lower extremities	
3. HISTORY OF RESOLVED ULCERS	Resident had an ulcer that was resolved or cured in LAST 90 DAYS 0. No 1. Yes	
4. OTHER SKIN PROBLEMS OR LESIONS PRESENT	(Check all that apply during last 7 days) Abrasions, bruises Burns (second or third degree) Open lesions other than ulcers, rashes, cuts (e.g., cancer lesions) Rashes—e.g., intertrigo, eczema, drug rash, heat rash, herpes zoster Skin desensitized to pain or pressure Skin tears or cuts (other than surgery) Surgical wounds NONE OF ABOVE	a. b. c. d. e. f. g. h.
5. SKIN TREATMENTS	(Check all that apply during last 7 days) Pressure relieving device(s) for chair Pressure relieving device(s) for bed Turning/repositioning program Nutrition or hydration intervention to manage skin problems Ulcer care Surgical wound care Application of dressings (with or without topical medications) other than to feet Application of ointments/medications (other than to feet) Other preventative or protective skin care (other than to feet) NONE OF ABOVE	a. b. c. d. e. f. g. h. i. j.
6. FOOT PROBLEMS AND CARE	(Check all that apply during last 7 days) Resident has one or more foot problems—e.g., corns, callouses, bunions, hammer toes, overlapping toes, pain, structural problems Infection of the foot—e.g., cellulitis, purulent drainage Open lesions on the foot Nails/calluses trimmed during last 90 days Received preventative or protective foot care (e.g., used special shoes, inserts, pads, toe separators) Application of dressings (with or without topical medications) NONE OF ABOVE	a. b. c. d. e. f. g.

SECTION N. ACTIVITY PURSUIT PATTERNS

1. TIME AWAKE	(Check appropriate time periods over last 7 days) Resident awake all or most of time (i.e., naps no more than one hour per time period) in the: Morning a. Evening Afternoon b. NONE OF ABOVE	c. d.
(If resident is comatose, skip to Section O)		
2. AVERAGE TIME INVOLVED IN ACTIVITIES	(When awake and not receiving treatments or ADL care) 0. Most—more than 2/3 of time 2. Little—less than 1/3 of time 1. Some—from 1/3 to 2/3 of time 3. None	
3. PREFERRED ACTIVITY SETTINGS	(Check all settings in which activities are preferred) Own room a. Outside facility Day/activity room b. Inside NH/off unit c. NONE OF ABOVE	d. e.
4. GENERAL ACTIVITY PREFERENCES (adapted to resident's current abilities)	(Check all PREFERENCES whether or not activity is currently available to resident) Trips/shopping Cars/other games Crafts/arts Exercise/sports Music Reading/writing Spiritual/religious activities	a. Walking/wheeling outdoors b. Watching TV c. Gardening or plants d. Talking or conversing e. Helping others f. NONE OF ABOVE

Resident _____

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5. PREFERENCES CHANGE IN DAILY ROUTINE	Code for resident preferences in daily routines 0. No change 1. Slight change 2. Major change	
	a. Type of activities in which resident is currently involved b. Extent of resident involvement in activities	

SECTION O. MEDICATIONS

1. NUMBER OF MEDICATIONS	(Record the number of different medications used in the last 7 days; enter "0" if none used)	
2. NEW MEDICATIONS	(Resident currently receiving medications that were initiated during the last 90 days) 0. No 1. Yes	
3. INJECTIONS	(Record the number of DAYS injections of any type received during the last 7 days; enter "0" if none used)	
4. DAYS RECEIVED THE FOLLOWING MEDICATION	(Record the number of DAYS during last 7 days; enter "0" if not used. Note—enter "1" for long-acting meds used less than weekly)	
	a. Antipsychotic	
	b. Antianxiety	
	c. Antidepressant	
	d. Hypnotic	
	e. Diuretic	

SECTION P. SPECIAL TREATMENTS AND PROCEDURES

1. SPECIAL TREATMENTS, PROCEDURES, AND PROGRAMS	a. SPECIAL CARE—Check treatments or programs received during the last 14 days	
	TREATMENTS	Ventilator or respirator
	Chemotherapy	a. PROGRAMS
	Dialysis	b. Alcohol/drug treatment program
	IV medication	c. Alzheimer's/dementia special care unit
	Intake/output	d. Hospice care
	Monitoring acute medical condition	e. Pediatric unit
	Ostomy care	f. Respite care
	Oxygen therapy	g. Training in skills required to return to the community (e.g., taking medications, house work, shopping, transportation, ADLs)
	Radiation	h. Suctioning
Suctioning	i. Tracheostomy care	
Tracheostomy care	j. TRANSFUSIONS	
Transfusions	k. NONE OF ABOVE	
	b. THERAPIES - Record the number of days and total minutes each of the following therapies was administered (for at least 15 minutes a day) in the last 7 calendar days (Enter 0 if none or less than 15 min. daily) [Note—count only post admission therapies] (A) = # of days administered for 15 minutes or more (B) = total # of minutes provided in last 7 days	
	a. Speech - language pathology and audiology services	
	b. Occupational therapy	
	c. Physical therapy	
	d. Respiratory therapy	
	e. Psychological therapy (by any licensed mental health professional)	
2. INTERVENTION PROGRAMS FOR MOOD, BEHAVIOR, COGNITIVE LOSS	(Check all interventions or strategies used in last 7 days—no matter where received)	
	Special behavior symptom evaluation program	a.
	Evaluation by a licensed mental health specialist in last 90 days	b.
	Group therapy	c.
	Resident-specific deliberate changes in the environment to address mood/behavior patterns—e.g., providing bureau in which to rummage	d.
	Reorientation—e.g., cueing	e.
NONE OF ABOVE	f.	
3. NURSING REHABILITATION/ RESTORATIVE CARE	Record the NUMBER OF DAYS each of the following rehabilitation or restorative techniques or practices was provided to the resident for more than or equal to 15 minutes per day in the last 7 days (Enter 0 if none or less than 15 min. daily)	
	a. Range of motion (passive)	f. Walking
	b. Range of motion (active)	g. Dressing or grooming
	c. Splint or brace assistance	h. Eating or swallowing
	TRAINING AND SKILL PRACTICE IN:	i. Amputation/prosthesis care
	d. Bed mobility	j. Communication
	e. Transfer	k. Other

4. DEVICES AND RESTRAINTS	(Use the following codes for last 7 days:) 0. Not used 1. Used less than daily 2. Used daily	
	Bed rails	
	a. — Full bed rails on all open sides of bed	
	b. — Other types of side rails used (e.g., half rail, one side)	
	c. Trunk restraint	
	d. Limb restraint	
	e. Chair prevents rising	
5. HOSPITAL STAY(S)	Record number of times resident was admitted to hospital with an overnight stay in last 90 days (or since last assessment if less than 90 days). (Enter 0 if no hospital admissions)	
6. EMERGENCY ROOM (ER) VISIT(S)	Record number of times resident visited ER without an overnight stay in last 90 days (or since last assessment if less than 90 days). (Enter 0 if no ER visits)	
7. PHYSICIAN VISITS	In the LAST 14 DAYS (or since admission if less than 14 days in facility) how many days has the physician (or authorized assistant or practitioner) examined the resident? (Enter 0 if none)	
8. PHYSICIAN ORDERS	In the LAST 14 DAYS (or since admission if less than 14 days in facility) how many days has the physician (or authorized assistant or practitioner) changed the resident's orders? Do not include order renewals without change. (Enter 0 if none)	
9. ABNORMAL LAB VALUES	Has the resident had any abnormal lab values during the last 90 days (or since admission)?	
	0. No 1. Yes	

SECTION Q. DISCHARGE POTENTIAL AND OVERALL STATUS

1. DISCHARGE POTENTIAL	a. Resident expresses/indicates preference to return to the community 0. No 1. Yes	
	b. Resident has a support person who is positive towards discharge 0. No 1. Yes	
	c. Stay projected to be of a short duration—discharge projected within 90 days (do not include expected discharge due to death) 0. No 1. Within 30 days 2. Within 31-90 days 3. Discharge status uncertain	
2. OVERALL CHANGE IN CARE NEEDS	Resident's overall self sufficiency has changed significantly as compared to status of 90 days ago (or since last assessment if less than 90 days) 0. No change 1. Improved—receives fewer supports, needs less restrictive level of care 2. Deteriorated—receives more support	

SECTION R. ASSESSMENT INFORMATION

1. PARTICIPATION IN ASSESSMENT	a. Resident: 0. No 1. Yes	
	b. Family: 0. No 1. Yes 2. No family	
	c. Significant other: 0. No 1. Yes 2. None	
2. SIGNATURE OF PERSON COORDINATING THE ASSESSMENT:		
a. Signature of RN Assessment Coordinator (sign on above line)		
b. Date RN Assessment Coordinator signed as complete		
	Month	Day
		Year

Resident _____

Numeric Identifier _____

SECTION T. THERAPY SUPPLEMENT FOR MEDICARE PPS

<p>1. SPECIAL TREATMENTS AND PROCEDURES</p>	<p>a. RECREATION THERAPY—Enter number of days and total minutes of recreation therapy administered (for at least 15 minutes a day) in the last 7 days (Enter 0 if none)</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="2">DAYS</th> <th colspan="2">MIN</th> </tr> <tr> <th>(A)</th> <th>(B)</th> <th>(C)</th> <th>(D)</th> </tr> </thead> <tbody> <tr> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> </tbody> </table> <p>(A) = # of days administered for 15 minutes or more (B) = total # of minutes provided in last 7 days</p> <p><i>Skip unless this is a Medicare 5 day or Medicare readmission/return assessment.</i></p> <p>b. ORDERED THERAPIES—Has physician ordered any of following therapies to begin in FIRST 14 days of stay—physical therapy, occupational therapy, or speech pathology service? 0. No 1. Yes</p> <p><i>If not ordered, skip to item 2</i></p> <p>c. Through day 15, provide an estimate of the number of days when at least 1 therapy service can be expected to have been delivered.</p> <p>d. Through day 15, provide an estimate of the number of therapy minutes (across the therapies) that can be expected to be delivered?</p>	DAYS		MIN		(A)	(B)	(C)	(D)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
DAYS		MIN											
(A)	(B)	(C)	(D)										
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>										
<p>2. WALKING WHEN MOST SELF SUFFICIENT</p>	<p>Complete item 2 if ADL self-performance score for TRANSFER (G.1.b.A) is 0,1,2, or 3 AND at least one of the following are present:</p> <ul style="list-style-type: none"> • Resident received physical therapy involving gait training (P.1.b.c) • Physical therapy was ordered for the resident involving gait training (T.1.b) • Resident received nursing rehabilitation for walking (P.3.f) • Physical therapy involving walking has been discontinued within the past 180 days <p><i>Skip to item 3 if resident did not walk in last 7 days</i></p> <p>(FOR FOLLOWING FIVE ITEMS, BASE CODING ON THE EPISODE WHEN THE RESIDENT WALKED THE FARTHEST WITHOUT SITTING DOWN. INCLUDE WALKING DURING REHABILITATION SESSIONS.)</p> <p>a. Furthest distance walked without sitting down during this episode.</p> <table border="0" style="margin-left: 20px;"> <tr> <td>0. 150+ feet</td> <td>3. 10-25 feet</td> </tr> <tr> <td>1. 51-149 feet</td> <td>4. Less than 10 feet</td> </tr> <tr> <td>2. 26-60 feet</td> <td></td> </tr> </table> <p>b. Time walked without sitting down during this episode.</p> <table border="0" style="margin-left: 20px;"> <tr> <td>0. 1-2 minutes</td> <td>3. 11-15 minutes</td> </tr> <tr> <td>1. 3-4 minutes</td> <td>4. 16-30 minutes</td> </tr> <tr> <td>2. 5-10 minutes</td> <td>5. 31+ minutes</td> </tr> </table> <p>c. Self-Performance in walking during this episode.</p> <p>0. INDEPENDENT—No help or oversight</p> <p>1. SUPERVISION—Oversight, encouragement or cueing provided</p> <p>2. LIMITED ASSISTANCE—Resident highly involved in walking; received physical help in guided maneuvering of limbs or other nonweight bearing assistance</p> <p>3. EXTENSIVE ASSISTANCE—Resident received weight bearing assistance while walking</p> <p>d. Walking support provided associated with this episode (code regardless of resident's self-performance classification).</p> <p>0. No setup or physical help from staff</p> <p>1. Setup help only</p> <p>2. One person physical assist</p> <p>3. Two+ persons physical assist</p> <p>e. Parallel bars used by resident in association with this episode.</p> <p>0. No 1. Yes</p>	0. 150+ feet	3. 10-25 feet	1. 51-149 feet	4. Less than 10 feet	2. 26-60 feet		0. 1-2 minutes	3. 11-15 minutes	1. 3-4 minutes	4. 16-30 minutes	2. 5-10 minutes	5. 31+ minutes
0. 150+ feet	3. 10-25 feet												
1. 51-149 feet	4. Less than 10 feet												
2. 26-60 feet													
0. 1-2 minutes	3. 11-15 minutes												
1. 3-4 minutes	4. 16-30 minutes												
2. 5-10 minutes	5. 31+ minutes												
<p>3. CASE MIX GROUP</p>	<p>Medicare <input type="text"/> <input type="text"/></p> <p>State <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p>												

Resident _____ Numeric Identifier _____

MINIMUM DATA SET (MDS) - VERSION 2.0
FOR NURSING HOME RESIDENT ASSESSMENT AND CARE SCREENING

SECTION W. SUPPLEMENTAL MDS ITEMS

1.	National Provider ID	Enter for all assessments and tracking forms, if available. <div style="border: 1px solid black; display: flex; justify-content: space-around; width: 100px; height: 15px; margin-top: 5px;"> </div>	
If the ARD of this assessment or the discharge date of this discharge tracking form is between July 1 and September 30, skip to W3.			
2.	Influenza Vaccine	<p>a. Did the resident receive the Influenza vaccine in this facility for this year's Influenza season (October 1 through March 31)?</p> <p>0. No (If No, go to item W2b) 1. Yes (If Yes, go to item W3)</p> <p>b. If Influenza vaccine not received, state reason:</p> <p>1. Not in facility during this year's flu season 2. Received outside of this facility 3. Not eligible 4. Offered and declined 5. Not offered 6. Inability to obtain vaccine</p>	
3.	Pneumococcal Vaccine	<p>a. Is the resident's PPV status up to date?</p> <p>0. No (If No, go to item W3b) 1. Yes (If Yes, skip item W3b)</p> <p>b. If PPV not received, state reason:</p> <p>1. Not eligible 2. Offered and declined 3. Not offered</p>	

APPENDIX B
HUMAN SUBJECTS APPROVAL FORM

Human Subjects Protection Program
<http://www.irb.arizona.edu>



1350 N. Vine Avenue
P.O. Box 245137
Tucson, AZ 85724-5137
(520) 626-6721

14 April 2006

Ceanne Alvine, Ph.D. Candidate
Advisor: Neva Crogan, Ph.D.
College of Nursing
PO Box 210203

RE: FACTORS THAT INFLUENCE MEDICARE PART A BENEFICIARIES LENGTH OF STAY AND DISCHARGE DISPOSITION IN THE NURSING HOME, AFTER A HOSPITALIZATION

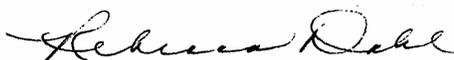
Dear Ms. Alvine:

We received documents concerning your above cited project. Regulations published by the U.S. Department of Health and Human Services [45 CFR Part 46.101(b)(4)] exempt this type of research from review by our Institutional Review Board.

Exempt status is granted with the understanding that no further changes or additions will be made to the procedures followed (copies of which we have on file) without the review and approval of the Human Subjects Committee and your College or Departmental Review Committee. Any research related physical or psychological harm to any subject must also be reported to each committee.

Thank you for informing us of your work. If you have any questions concerning the above, please contact this office.

Sincerely,



Rebecca Dahl, R.N., Ph.D.
Director
Human Subjects Protection Program

cc: Departmental/College Review Committee

APPENDIX C
CODING DICTIONARY

Variable Name	Coding
Age (age)	CRV-MDS Sections AA3 and & A3a
Gender(sex)	Dichotomous variable-MDS section AA2 0=male 1=female
Marital status (marital)	Dichotomous variable-MDS section AB 0=not married 1=married
Race(race)	Dichotomous variable-MDS Section AB 0=all other 1=Caucasian
Cognitive functioning (CPS score)	CRV from Cognitive Performance Scale 0=No Cognitive impairment 1=Borderline impairment 2=Mild impaired 3=Moderately impaired 4=Moderately severe impairment 5=Highly severe impairment 6=Very severe impairment
Physical functioning (ADL score)	CRV 0-16, computed from ADL Scale
Pain	Dichotomous variable- MDS Section J2a 0=no pain 1=pain
Pressure Ulcers Stage I and II	Dichotomous variable from Section M1a,b,c,d 0=no Stage I or II pressure ulcer present 1=yes, Stage I or II pressure ulcer present
Pressure Ulcers Stage III and IV	Dichotomous variable from Section M1a,b,c,d 0=no Stage III or IV ulcer present 1=yes, Stage III or IV ulcer present
Physical Restraints	Computed Dichotomous variable- MDS Section P4a,c,d,e 0=no physical restraint 1=presence of physical restraint
Depressive Symptoms Without Treatment	MDS Section E, I1ee, O4c 0=no depressive symptoms 1=depressive symptoms present, not on anti-depressant therapy
Size (facsize)	CRV

Profitability status (facprofit)	Dichotomous variable, Nursing Home Compare 0=not-for-profit status 1=for-profit status
Chain membership (facchain)	Dichotomous variable Nursing Home Compare 0=non-chain member 1=chain member
Level of vertical integration (facvert)	Dichotomous variable Nursing Home Compare 0=not vertically integrated 1=vertically integrated
Medicare length of stay	Computed variable: Date of discharge from Medicare minus date of entry
Custodial length of stay	Computed variable: Discharge date from facility minus date off Medicare
Medicare & custodial length of stay	Date of discharge from facility-date of entry
Discharge outcome (from MDS Discharge Tracking form)	1=private home/apt. with no home services 2=private home/apt. with home health services 3=Board and care/assisted living 4=another nursing facility 5=acute care hospital 6=psychiatric hospital 7=deceased 8=other 9=stay in same nursing home 10=Remain in same nursing home

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