OUTCOMES OF MINNESOTA NURSING HOME RESIDENTS AND THEIR RELATIONSHIP TO FACILITY STRUCTURAL AND PROCESS-RELATED ATTRIBUTES

by

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Submitted to Rush University in
partial fulfillment of the requirements for
the degree of Doctor of Nursing Science

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ABSTRACT

Outcomes of Minnesota Nursing Home Residents and their Relationship to Facility Structural and Process-related Attributes

Mary M. Bliesmer, Doctor of Nursing Science, 1994

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The purpose of this research was to observe outcomes of Minnesota nursing home residents admitted from 1988 through 1990 and identify the relationship these outcomes had to selected facility structural and process-related attributes of care. A literature review supported assumptions that nursing home care should be aimed toward assisting residents to achieve the highest possible level of independence and that a greater amount of licensed nursing hours may lead to beneficial outcomes for nursing home residents.

This retrospective study examined the effects of selected Minnesota nursing home attributes (size, ownership, noncompliance with a state correction order, and intensity of licensed nursing hours) on specific resident outcomes

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(functional ability, discharge home, and death), contolling for age and previous functional ability. The following hypothesis was tested: Improved functional ability and discharge home are more likely to occur as a result of a higher intensity of licensed nursing hours in Minnesota nursing homes.

The functional outcome was operationalized by calculating the resident's Total Dependence Score [TDS], the total score on the assessment of eight Key Activities of Daily Living (score range: 0-33). The residents followed were 65 years of age or older and lived in most of the 440 nursing homes in Minnesota.

Least squares regression analysis was used to estimate the effects of facility attributes, admission TDS, and age on resident outcomes and nonlinear probability analyses to estimate the effects of facility attributes, admission TDS and age on the probability of death or discharge home. In the year after admission, a higher intensity of licensed nursing hours was significantly related to improved functional ability, increased probability of discharge home, and decreased probability of death, supporting the use of more licensed nurses in the nursing home setting.

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Chapter 1

Introduction

This chapter provides the background, purpose, and significance of a study which modeled the relationship of various facility attributes to specific outcomes of Minnesota nursing home residents admitted in 1988, 1989 and 1990. Key terms and acronyms are explained. Assumptions and limitations of the study complete the introduction.

Background

Improving the quality of care for nursing home residents is one of the nation's most challenging problems. Consumers, providers, regulators, and policy makers are becoming increasingly concerned with the quality and cost of services provided to nursing home residents and system reform is in progress. Within the regulatory system of the nursing home industry, two strategies for attempting to improve quality can be used, singularly or in combination: the consultative, educational strategy and the adversarial, punitive strategy. An adversarial relationship is apparent between providers and regulators, but the use of punitive strategies seems to have had limited success in improving the overall quality of care. A consultative, educational strategy that is more likely to support quality improvement needs to be implemented. Major reforms in the present nursing home regulation and reimbursement system should be empirically justified in terms of measurable outcomes of care.

The regulation and reimbursement of nursing home care have been related to structural and process-related attributes of care that are presumed to be associated with quality in spite of minimal correlation between these attributes and what actually happens to individual nursing home residents. This lack of convincing empirical evidence of a linkage between structure, process and outcome is a strong

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argument for more outcome-related research. Research that demonstrates the achievement of beneficial resident outcomes in facilities with certain attributes should support increased reimbursement for effective performance.

The apparent inability of the nursing home regulatory system either to force substandard facilities to improve their performance or to eliminate them was the underlying circumstance that prompted a study of government regulation of nursing homes, conducted by the National Academy of Science's Institute of Medicine (IOM) Committee on Nursing Home Regulation (1986). The IOM study report emphasized that research linking structure, process and outcome elements of nursing home care quality was limited and better information was needed. The report also included many recommendations for change in government regulation of nursing homes. Of special interest is the following recommendation that should encourage the administration of nursing homes to monitor residents' outcomes:

> "A new condition of participation on quality of care should be added to the certification regulations. It should state that each resident is to receive high-quality care to meet individual physical, mental, and psychosocial needs. The care should be designed to maintain or improve the residents' physical, mental, and emotional well-being" (IOM, 1986, p. 27).

Vladeck (1980) identified retarded deterioration of nursing home residents as the short-range outcome of optimal care. He reported that nursing home standards are criticized for being weak, distorting priorities, deferring to professional status, ignoring the client, and emphasizing "inputs" and "process" rather than "outcomes".

> "Since the service being delivered is so hard to define, let alone to measure, regulators rely on professional licensure (inputs) or peer review (process). The regulation of inputs or processes, rather than outcomes, permits society to avoid directly confronting problems of overwhelming moral and political complexity. The political system chooses to mandate what seems reasonable from the viewpoint of common sense and professional judgment and to deliberately refuse to

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attempt to find the technically 'correct' solution" (p.172).

The public's perception of the quality of care in nursing homes was surveyed in 1986 (Steiber, 1986). A Gallup poll with 1000 respondents revealed that 57 percent of Americans did not want to be cared for in a nursing home and 51 percent were unwilling to place their relatives in one. More than half (53 percent) believed that nursing homes provide either moderately or very low quality care. Only 37 percent thought that nursing homes generally offer good quality care while slightly more (48 percent) felt that hospital-affiliated homes offer good quality care.

A "report card", based on federal survey data from 2600 nursing homes across the United States, appeared in US News and World Report in 1988. The requirement to have food stored, refrigerated, prepared, distributed and served under sanitary conditions was failed by the highest percentage of homes (42.8%). However, one Minnesota nursing home administrator related to this researcher that her home's deficiency related to this standard was based on dust on the kitchen light fixture and a box of pudding stored four inches above the floor instead of six inches. It is important to note that a documented deficiency may represent either an ongoing problem or a one-time failure that was evident at the time of the survey.

Over 21 percent of the nursing homes surveyed failed to meet the requirement that each resident receive rehabilitative nursing care to promote maximum physical functioning and to prevent loss of walking ability, deformities and paralysis. It is possible that these deficiencies may have been cited because of lack of documentation of care provided rather than an actual lack of rehabilitative nursing care. It would be more appropriate to consider changes in residents' functional status over time as outcomes of the rehabilitative care provided in a facility. Most of the federal requirements are related to process

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indicators of quality such as facility staff performance, rather than outcome indicators of quality. Patterns of staff performance and possibly even one-time failures in performance are monitored rather than actual individual resident outcomes.

Harris (1985) believes that most of the problems related to federal standards and issues of long-term care quality exist because standards are used to demonstrate a negative - that something is wrong, but cannot prove the presence of a positive - that quality exists. Those who are concerned with the quality of long-term care are advised by Harris to avoid the term and recognize existing federal standards as simply defining and describing adequate services. It may then be possible to begin to define and describe elusive but desirable and attainable components of quality, namely outcomes.

Purpose

The purpose of this investigation was to explore the relationship of specific outcomes of Minnesota nursing home residents to facility structural and process-related attributes. One approach was to observe residents' functional ability one and three years after admission and relate this ability to selected facility attributes. Another approach was to relate the outcomes of death and discharge home to the same facility attributes.

An answer to the following multifaceted question was sought: What are the relationships between specific resident outcomes and the following facility attributes: 1) size; 2) ownership (profit vs not-for-profit); 3) compliance with a state correction order; and 4) hours of licensed and unlicensed nursing care? The following hypothesis was tested: Improved functional ability and discharge home are more likely to occur as a result of a higher intensity of licensed nursing hours in Minnesota nursing homes.

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Definition of Terms and Acronyms .

For the purpose of this study, key terms and acronyms are defined.

Functional ability: Ability to perform eight Key Activities of Daily Living [KADL] with a possible range of 0 to 33: 1) dressing (0-4); 2) grooming (0-3); 3) bathing (0-5); 4) eating (0-4); 5) bed mobility (0-3; 6) transferring (0-4); 7) walking (0-4); and 8) toileting (0-6).

Facility structural attributes: characteristics of the nursing homes in which residents live, specifically size, ownership and nursing hours.

Process-related attributes: action-oriented facets of the nursing homes in which residents live, specifically compliance with state correction order.

Licensed nursing hours [LNH]: Registered and licensed practical nursing hours per standardized resident day, nursing director excluded. There must be a registered nurse on duty seven days a week for eight hours, a licensed nurse 24 hours a day.

Productive nursing hours [PNH]: Licensed nurse and unlicensed nursing assistant hours [UNH] per standardized resident day. Nursing director is included if facility is smaller than 60. State requirement was and still is a minimum of 0.95 PNH per standardized resident day.

Standardized resident day: Sum of the number of residents in each case-mix category (A-K) multiplied by case-mix weights (Appendix C). Calculated on the basis of the facility's census for a given day.

Significance

The significance of this study is supported by the increasing number of Minnesota elderly citizens who may require nursing home care in the future. The cost of this care greatly exceeds the annual inflation rate and provider

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accountability for outcomes of nursing home care is lacking. If outcomes are to be a method for evaluating the effectiveness of care in a nursing home setting, studies that relate beneficial outcomes to structural and process-related characteristics of nursing homes must be completed and reported.

The population of the United States is growing older. The oldest segment of the population, comprised of those over 85, is the fastest growing age group in the country, and is expected to triple in size between 1980 and 2020 (Matteson, 1990). Since a nursing home is sometimes the most appropriate setting for the impaired elderly, nursing home utilization and costs are predicted to increase as well. Residents who are 85 and older already comprise 45 percent of the national nursing home population (U. S. Senate, 1990).

The number of Minnesotans 85 years and older, the population group most dependent on long-term health care, is projected to grow by 51 percent between 1985 and 2000. Minnesota has a high number of nursing home beds per 1000 persons over 65, ranking third in the nation in 1982 with 85 beds per 1000 elderly, compared to a national average of 55 beds per 1000 elderly (Minnesota State Planning Agency [MSPA], 1987). According to the Office of the State Demographer in Minnesota, 7.95 per cent of elderly Minnesotans are in nursing or boarding homes compared to a national average of 5 per cent. This higher percentage is probably related to the comparatively large number of beds available.

Nursing home care is a major portion of the health care expenditures of the federal government. According to Congressional Budget Office estimates, total national spending on long-term care for all age groups was $44.9 billion in fiscal year 1985. Of this amount, $35.8 billion was for nursing home care, with the largest portion financed by federal and state Medical Assistance (MA). Private payments covered 45 percent of the costs and long-term care

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insurance paid for only eight-tenths of one percent of nursing home care (U. S. Senate, 1990).

According to Charles V. Osell, Long-term Care Management Division, Minnesota Department of Human Services, approximately $1.3 billion was spent on nursing home care in Minnesota in 1992. The weighted average daily rate across all levels of care was $82.13 or almost $30,000 per year. Federal, state and local reimbursement systems provide the funds for nursing home care needed by medical assistance recipients, approximately 64% of the total cost; 30% is private pay, 5% is Medicare, and 1% comes from insurance and veteran's payments. Minnesota law mandates rate equalization, which means private-pay residents in nursing homes do not pay more than the MA rates for the same care provided in non single rooms. However, the majority of private-pay residents eventually become eligible for MA (MSPA, 1987).

Any proposal for major reform of the nursing home regulation and reimbursement systems should recognize the need for provider accountability. This could be reflected by partially basing reimbursement on the achievement of outcomes that are beneficial to residents. If rewards were related to beneficial outcomes such as going home and improved functional ability, providers would be increasingly attentive to them, and improvement in the quality of nursing home care should be a result.

Outcomes form one part of the classic triad used to define quality of care: structure, process and outcome. Critical application of the outcome concept will direct attention specifically to the resident's well-being, emphasize the individual instead of the total population, and consider the interests of the nursing home resident over those of society (Lohr, 1988).

Quality assurance monitoring should encompass all aspects of care: structure, process and outcomes (Biersbach, 1988). These elements are not alternatives but instead are mutually supportive aspects of a complete assessment.

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Biersbach also proposed a concerted effort to challenge conventions, such as standards and practices that are assumed to indicate quality but which have not been subjected to critical examination.

Bloch (1975) expressed the need for working toward the goal of a process-outcome approach to patient care evaluation, making the following recommendation which has not yet been fully realized: "Nurses, physicians, and other health care providers should develop *patient care* outcome criteria (along with the methods for measuring such outcomes), rather than nursing care or medical care or physical therapy outcomes..... because.....it is the outcome of his *total care* which matters to the patient" (p.262).

Katz and Stroud (1989) reviewed the progress and direction of functional assessment in geriatrics, concluding that information about function is essential and practical for making appropriate clinical judgments about treatment and care. Even though useful measures of activities of daily living have been developed (e.g.,the Index of ADL), work must continue on the development of reliable and valid functional assessment tools. Research is necessary to explore the qualitative and quantitative interrelationships among various domains of functioning (e.g., cognitive function, ADL, and mobility). They further emphasized the need for information about the predictive validity of functional measures, in order to increase the availability of information about prognosis. This study provides evidence of the predicitive validity of a specific functional ability measure.

Even though the natural course of many aging nursing home residents may be physical and/or mental decline, specific benefits of better-than-average care can be demonstrated by comparing the results of care to a set of expectations. The critical measure of outcomes of care, therefore, would be the difference between achieved outcomes

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and expected outcomes, with the prediction of expected outcomes made on an aggregate statistical basis.

Measures that compare observed and predicted outcomes could be substituted for some of the current measures of structure and process when assessing quality of care and making reimbursement decisions. Structure and process elements of nursing homes will differ. However, under an outcome-regulated approach, providers whose residents do better than expected could be rewarded and those whose residents do relatively poorly could be penalized or at least investigated more closely.

The value of comparing observed and expected outcomes could extend beyond its role as a regulatory device (Kane, 1990). It is often difficult for employees in nursing homes to sense when they have actually made a difference with residents. Evidence that a slowing of expected decline or that improved function and discharge of residents has occurred could provide a meaningful non-financial reward for provider services.

Results obtained from this study are the basis for publishable results that may benefit Minnesota nursing home residents in particular as well as nursing home residents nation-wide. Analysis of the relationship that specific outcomes have with structural and process-related attributes of nursing home care contributes to a better understanding of which attributes of care are beneficial or detrimental. It also provides a foundation for further development of an outcome-based approach to nursing home quality assurance, reimbursement and regulation.

Assumptions and Limitations

The following assumptions were made: (1) One goal of nursing home care is to restore and maintain the highest possible level of functional independence of its residents (Kane, Ouslander & Abrass, 1989) and (2) A nursing home's

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structural and process-related attributes of care influence the outcomes of its residents.

A limitation of this study was the fact that resident data used were collected by registered nurses from 1988 through 1991 for the purpose of reimbursing Minnesota nursing home care, not for this particular research analysis and interpretation. Also the facility variables were collected by the Long-Term Care Division of the Minnesota Department of Human Services for state regulation, cost factoring and analysis. Furthermore, all variables that influenced the future status of nursing home residents could not be measured or controlled in this study. Only Minnesota nursing home resident and facility data were analyzed, therefore implications of this study must be cautiously generalized to residents and facilities in other states.

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Chapter 2

Review of Related Literature

Quality was the first concept briefly reviewed since the results and interpretation of this research provide a basis for recommendations that intend to improve the quality of nursing home care. Literature related to various outcomes of care support this study's exploration of the relationship that outcomes have with specific attributes of nursing homes. A predictive equation estimating this relationship was tested, therefore information related to predicting outcomes of care was included. Nursing home resident characteristics completed the literature review. This is the population to which implications of this study are cautiously generalized.

Quality of nursing home care

Tellis-Nayak (1988) offered a simple statement about the subjective meaning of quality in a nursing home. "You have high quality when the nursing home resident is satisfied - with oneself, with the nursing home, and with the care one receives" (p. 5) However a consensus has not been reached concerning objective standards and criteria for quality of care measurement.

Older persons may be particularly vulnerable to poor quality medical care (Siu,1987). Siu reviewed 14 studies of the quality of medical care in nursing homes and concluded that the absence of physician attentiveness, involvement and leadership may contribute to circumstances in nursing homes that would not be permitted in acute care settings. Siu also suggested other reasons for suboptimal care for older persons: (1) poor public and provider attitudes; (2) insufficient reimbursement; (3) lack of clinical agreement on how to treat illnesses and impairments of the elderly; and (4) a low level of expectations from both patients and

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society concerning the therapeutic potential of treatments for the elderly.

Residents with similar nursing care requirements in four nursing homes in Maryland received care of unequal quality according to Mech (1980) and it was suggested that since reimbursement was not tied to quality, there was no incentive to raise standards of care. The Quality Patient Care Scale (revised from 68 to 49 items) was used to assess whether nursing care was provided that met the needs of 80 residents, 20 in each skilled nursing care facility. The study subjects were between 65 and 85 years of age and had resided in the homes for at least three months but less than seven years. The residents were documented to be dependent to varying degrees in six or more of eight functional categories: transferring, walking, bathing, dressing, eating, bowel function, bladder function, and communication of needs.

Although not generalizable, several factors that may be related to meeting the nursing care needs of residents in skilled nursing facilities were identified by Mech (1980). Providing for the nursing care needs was associated with the following facility characteristics: not-for profit status, urban location, larger staff (particularly licensed personnel), lower ratio of residents requiring skilled care, and larger number of available support services.

The presence of professional nurses was consistently cited as the most important factor in maintaining quality of care in nursing homes (IOM, 1986; Mezey and Lynaugh, 1989; Nyman, 1988; Tellis-Nayak, 1988, Linn, Gurel and Linn, 1977). The Robert Wood Johnson Foundation Teaching Nursing Home Program was conceived as a model for restructuring and enhancing nursing care by supporting closer collaboration between academic settings and nursing homes (Mezey and Lynaugh, 1989). Eleven university nursing schools and 12 nursing homes participated in this program.

Three categories related to quality of care are described by Donabedian (1968 & 1988): "(1) Structure denotes

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the attributes of the settings in which care occurs; (2) Process denotes what is actually done in giving and receiving care; and (3) Outcome denotes the effects of care on the health status of patients and populations" (p. 1745). Historically, structure and process approaches to quality measurement have been used extensively. More recently, the outcome approach has been emphasized.

Donabedian's description of these categories related to quality of care was transformed into a proposal that outcomes of care are a product of the structure and process of care. This proposed relationship became the theoretical framework for this study.

Nursing home care outcomes

Many years ago, Anderson and Stone (1969) contended that nursing home care should be aimed at assisting the individual resident to achieve the highest possible level of independence and proposed the following plan for research:

> What researchers should be doing is identifying ways of not only classifying patients but also predicting their rehabilitation or other goal achievement potential. Then quality could be measured, not in terms of *input* (facilities, staff, and other resources) or in terms of *output* (what programs and activities are undertaken or participated in), but in terms of *outcome* : is the patient restored to and maintained at the best level of functioning possible? (p. 216).

An "outcome-oriented" survey of most of the intermediate care nursing homes in Iowa was completed as part of an annual licensing survey (Lee, 1984). The sample included 254 profit-oriented, 103 nonprofit, and 10 government-owned facilities. Lee's results are based on one observation of approximately 14 percent of the residents in each facility or approximately 3700 residents, randomly selected.

The survey data were collected using a variety of measurement and observational methods and were organized around three broad categories: facility and resident characteristics, procedural requirements, and quality of

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care. The only actual "resident" outcome measured was resident satisfaction. The validity of the survey instrument was substantiated by the fact that results obtained with its use were significantly different between good and poor facilities, as defined by the federal survey result.

Spearman-Brown's correction formula was used to test the reliability of items that required the surveyor's rating. For example, the resident satisfaction measure (interview results on five items) was found to have fairly high item-to-total correlations (ranging from 0.771 to 0.915) and the split-half reliability coefficient was 0.915. The results of reliability testing suggested that the instrument was administered with measurable consistency.

These intermediate care facilities were found to be doing a questionable job of reviewing the health care progress of residents. Eighty-eight percent of the sampled residents had their health status reviewed on a quarterly basis, but only 62 percent of this sample were found to have the quarterly reviews judged as satisfactory. Data analysis indicated that ownership status of the facility had a discernible impact on quality of care survey scores. Nonprofit facilities had generally higher scores than the profit facilities, with the analysis of variance showing a significant difference between the two types. Also small proprietary facilities performed consistently lower than large facilities in general and the nonprofit-oriented in particular.

Lee (1984) concluded that surveys provide a data base for both an empirical evaluation of the *actual* as opposed to the *implied* quality of nursing home care and for identifying issues and problems of policy interest. Also the outcome-oriented approach provides an environment for communication and consultation between the regulatory agencies and the nursing facilities concerning the intention of public policy, not just the rules for their own sake.

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An analysis of the 1983 Iowa Outcome Oriented Survey data was completed to determine to what extent various nonhealth measures of quality (e.g., average number of licensed nursing hours per resident day, implementation of care plans, and resident satisfaction) were associated with higher costs per resident day (Nyman, 1988). None of the quality measures was significantly associated with higher average costs. These results led Nyman to propose incentive-oriented determinants for these nonhealth outcome measures of quality. "Registered and licensed practical nurses seem to be the most important professionals in nursing homes. Thus, nurses might be expected to be motivated to improve the quality of care patients receive independent of the directives of their supervisors, and be more motivated than caregivers with less training. One possible determinant of quality, therefore, is the number of RN or LPN hours per patient day" (p. 1165). Nyman also suggested that nonprofit status was a potential incentive-oriented determinant of quality. His argument was based on the assertion that nonprofit homes may be more motivated than proprietary homes to provide high quality care due to the existence of altruistic goals.

Mezey (1989) shared three concerns related to conceptual and methodological problems in the use of outcome criteria in quality of care research. First, patient status changes may not be detectable, may not be susceptible to interventions, or may be attributable to unknown factors. The second potential confounder is case mix, which represents the aggregate resident profile of a nursing home, including factors such as resident ADL status, nursing and medical problems and behavioral status. Controlling for case mix in evaluation research is important if outcomes are to be compared over time in a single facility or between one facility and another.

Thirdly, facility characteristics and time of measurement are potentially related to outcomes. Size,

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ownership, administrative stability, staffing patterns, and reimbursement all may affect outcomes. Some outcomes may be stable over time and can be identified using cross-sectional data collection methods. Other outcomes may be highly variable and fluctuate between data collection points, thus longitudinal methodology is appropriate.

According to Fottler (1987) outcome indicators are imperfect and subject to bias and interpretation. Negative outcomes can occur in spite of superior performance and positive outcomes may not necessarily be the result of superior performance. Despite such limitations, Fottler believes that scholars have an obligation to attempt to measure outcomes, refine these measurements, and relate outcomes to controllable structural and process variables.

Using multivariate analysis, Linn et.al.(1977) related resident outcomes, six months after admission, to nursing home characteristics, controlling for physicians' prognoses, age and diagnosis of cancer and chronic brain disease. The sample consisted of 1000 males transferred from a VA hospital in Miami to 40 community nursing homes. More registered nurse hours per resident were associated with residents being alive, functionally improved, and discharged. A higher professional staff to resident ratio, better medical records, and more services were related to residents being discharged from the facility.

In a study based on 2500 residents in 80 nursing homes in Rhode Island during the mid-eighties, multivariate models were estimated to determine which aspects of care were associated with outcomes, after controlling for resident characteristics (Spector and Takada, 1991). Mortality, functional decline (higher score on the Katz Index of Activities of Daily Living) and functional improvement (lower score) were observed after six months time. Low levels of staffing in homes with very dependent residents were associated with reduced likelihood of functional improvement. For-profit status, controlling for staffing levels and cost,

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was associated with reduced likelihood of death in six months but not with functional change. Receipt of serious federal citations was associated with improved outcomes causing the authors to suggest that the federal quality regulation system may improve the quality of life of residents since facilities need to propose a plan of correction related to deficiencies.

During the New Jersey state fiscal year 1989, an attempt was made to determine the relationships between outcomes of nursing home care and nurse staffing amounts that met or exceeded the proposed regulatory requirements of 2.5 hours per resident per day (Amor and Weisfold, 1989). A Resident Outcome Assessment Instrument addressing four outcome domains (cognitive, functional, physical, and resident satisfaction) was completed with residents (960 at first assessment and 842 three months later). The residents were distributed evenly across 16 facilities; eight facilities met the proposed staffing requirements.

In these New Jersey homes, many residents with low initial scores in the functional domain (e.g. eating, dressing, bathing, walking, transferring) were found to improve, that is, to attain higher scores on the subsequent assessment. Functional outcomes were significantly more favorable in the less highly staffed facilities, causing the authors to presume that functional outcome is less sensitive to nursing care than to resident status. However, the authors also suggest that the three-month interval between assessments may have been too short to reveal strong differences between groups.

In nursing homes, the major providers of long-term care, quality must address the elements of care and outcomes that are meaningful to clients (Kane and Kane, 1988). Obviously clients have no desire for possible negative outcomes such as being restrained, being fed, and developing bedsores. More desirable are positive outcomes such as functional improvement, satisfaction, and being discharged home. If appropriate assessment and care can lead to

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functional improvements, such improvements may become a hallmark of good long-term care. According to Kane and Kane (1988), realistic nursing home outcomes are very much the product of the resident's previous level of performance; therefore the best measure of outcomes compares what is achieved to what is expected.

Prediction of outcomes

Nursing home resident outcomes can be reliably measured and predicted (Kane, Bell, Hosek, Riegler, and Kane, 1983). Residents in four Los Angeles area homes were assessed every three months with an instrument developed to measure the status of residents in six domains: cognitive, affective, physical, functional (ADL), social, and satisfaction. The average number of residents in any of the 3 waves of examinations was 250. Data from resident assessments and medical records were used to predict the future status of residents. The models for prediction relied primarily on regression analyses.

A prediction of patient functioning in the six domains was made with R^2 values of .51-.93 (ADL domain: .74). Of the available variables, the best predictor of any scale score was the same scale score from a previous wave, whether it was three months or six months earlier. Scores represented short-term variation on a fairly fixed individual level, supporting a suggestion by the authors that panel nursing home data can be analyzed with variance component methods.

Four types of status changes were also predicted: death, discharged better (to the community), discharged worse (usually to the hospital), and other discharges. Predictions of discharge were less accurate with R^2 values of .36 -.39. The authors believed that if more new admissions had been assessed, the number of discharges would have been substantially higher and the ability to model this process would have improved. A plan was proposed for linking reimbursement to beneficial outcomes of nursing home care.

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A reimbursement scheme was developed that applied a Prognostic Adjustment Factor to the basic payment to reward facilities that demonstrated outcomes that were better than expected and penalize those with outcomes that were worse than expected.

Willemain (1983) warned that a reimbursement system such as the one proposed by Kane et.al.(1983) must cope with two inevitable and potentially damaging problems: chance effects and errors in prognosis. Even if a provider does well at improving prognosis, resident outcomes still depend to a degree on unpredictable and perhaps unmeasurable factors. To minimize these risks, Willemain proposed averaging over more residents and properly shaping the reward function, relating payments to differences between observed and expected outcomes. Prognostic expectations will sometimes be wrong because the dynamics of the status changes of residents are not fully understood. A system of outcome reimbursement needs enough margin for error to accommodate the problems of chance effects and prognostic bias. Willemain further suggested that in order to predict changes in status effectively, an analysis of a comprehensive data base should be done to learn how one status converts to another.

Kane et.al.(1983) were aware that predictions of scale scores or status change would be diminished by unforeseen events, some of which may not be controllable by providers. Residents may develop serious medical problems, which would represent "noise" in the system. If assumed to be random events, they would be a source of imprecision, necessitating the use of confidence intervals to allow for variation. Alternatively, major events could be a basis for providers to negotiate "exceptions" to the reimbursement policy. Donabedian (1988) was surprised by the predictive power realized by Kane et.al.(1983) and suggested that knowledge of each resident's recent progress, coupled with the relatively slow pace of change, may have helped achieve the high correlations.

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The hypothesis that nursing home outcomes are not solely a result of uncontrollable patient characteristics but also are influenced by factors which may be controllable was tested and reported by Rohrer and Hogan (1987). Exploratory regression analysis was used to model functional outcomes of 290 residents in two VA homes in Michigan, using nonrandom sample survey data collected by facility nurses in June and September of 1983. It was demonstrated that the future functional status of residents could be predicted on the basis of their present functional status and the amount of staff time they were consuming. Degree of dependence of eating, dressing, and mobility assessed on the first survey were used to compute modified Fries and Cooney Resource Utilization Groups (RUGS). This RUGS score was used as a summary measure of the residents' ability to function physically. Outcomes were hypothesized to be a function of the resources residents consumed and their functional status at the time of the first survey. It was found that resource use, as measured by minutes of nursing time, was associated with outcome RUGS when case-mix was controlled.

Rohrer and Hogan's (1987) results indicated that the quantity of care provided by licensed nurses and aides, psychosocial care, and physician care were related to future functional status of nursing home residents. Staff time was not randomly 'wasted' but was driven by residents' needs. Results also led to the following working hypothesis: "patient outcomes can be used as an indication that adequate quantities of unskilled, psychosocial, and physician care are being delivered" (p. 222). The use of time series data and improved model specification were suggested for future research to provide a basis for policies leading to more effective regulation of nursing home quality.

Another study that focused on functional variation and nursing requirements was reported by Morris, Sherwood, May and Bernstein (1987). Three separate random samples were drawn from the residents at the Hebrew Rehabilitation Center

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for Aged:1983(N = 350), 1984 (N = 280) and 1985-86 (N = 261). These samples were used to develop a tool entitled "Functionally Ranked Explanatory Designations" (FRED). The operational perspective of this tool focused on the total nursing requirements for nursing home residents who vary in regard to ADL dependencies (seven categories) along with behavioral deficiencies (three categories).

FRED was also applied to nursing homes in 11 states in which placement decisions were based on the Intermediate Care Facility/Skilled Nursing Facility (ICF/SNF) system. Although overlap occurred, considerable differentiation was observed when contrasting the FRED classification system with placement decisions based on the ICF/SNF system. FRED was shown to be capable of differentiating nursing home residents as internally consistent subgroups and of identifying significant variations in ADL status and behavioral problems. Also it was able to estimate the hours of nursing care required by the 10 categories of residents.

Nursing Home Resident Characteristics

The 19,000 nursing homes in the United States are the long-term care setting for services to over 1.6 million residents (Mezey, 1989). One of every 5 people living past the age of 65, and one of four people aged 85 and older will spend some time in a nursing home. The median age of nursing home residents is 81 years; 73 percent are female and 93 percent are white. In 1988, there were 42,925 residents in Minnesota nursing homes (Minnesota Department of Health [MDH], 1989). Average resident age was 83.1 years; 71.2% were female and 28.8% were male.

The functional status of each Minnesota nursing home resident is a major focus of assessment when case-mix classifications are periodically determined by registered nurses (MDH, 1987). Routine assessments of residents are completed on admission to the facility, annually by the Minnesota Department of Health Quality Assurance and Review

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(QA&R) team, and semi-annually by the facility six months after the QA&R team visit. Residents are also assessed upon return from the hospital, 30-35 days post return from the hospital, and if there is a change of licensure level within the facility. The tool used for this assessment and its explanation are Appendices A and B. This Case Mix System of Reimbursement in Minnesota allows for eleven classifications which reflect the care needs of each resident and is the basis for monetary reimbursement.

Each resident's degree of dependence in eight Key Activities of Daily Living is determined: dressing, grooming, bathing, eating, bed mobility, transferring, walking, and toileting. A resident is categorized as Low ADL (dependent in 0-3 ADL), Medium ADL (dependent in 4-6 ADL), or High ADL (dependent in 7-8 ADL). Other items are then considered before the case-mix classification of A through K is determined: behavioral problems, special nursing care needs, and neurological impairment. The Resident Classification Decision Tree is shown in Appendix C. Classification A is reimbursed at the lowest rate; the highest payment is received for classification K. A nursing home's payment rate for each resident classification is determined by the Minnesota Department of Human Services.

Following are the case-mix classification percentages at one time in 1988: A (Low ADL dependencies): 24.6%, B (Low ADL + behavior problem): 7.9%, C (Low ADL + special nursing): .3%, D (Medium ADL dependencies): 9.2%, E (Medium ADL + behavior problem): 6.8%, F (Medium ADL + special nursing): .4%, G (High ADL dependencies): 15%, H (High ADL + behavior problem): 8.7%, I (Very high ADL + help with eating or fed): 6.8%, J (High ADL + severe neurological impairment or behavior problem): 16.4%, and K (High ADL + special nursing): 4%. See Table 1 for the case-mix classification for the residents admitted in 1988 and included in this study.

Seventy-five percent of persons entering a nursing home stay less than one year, and one-third to one-half stay for

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less than 3 months (U. S. Senate Special Committee on Aging, 1990). Aiken, Mezey, Lynaugh, and Buck (1985) reported that residents admitted directly from hospitals (over one-third of total nursing home admissions) are at earlier stages of recovery from acute illnesses and surgery than prior to Medicare's prospective pricing system for hospitalization. Mezey (1989) also reported that a third of nursing home residents are transferred to an emergency room and 25 percent are hospitalized annually.

Kane et.al.(1983) reported that recently admitted residents are more likely to incur any type of status change than are long-stay residents. This report justified the consideration that different variables are related to status changes of short stayers and long stayers. Short stayers enter with an acute problem that typically ends (for better or worse) in a few months time. Therefore, admission diagnoses may be more important as predictors of status change for new admissions but less important for long stayers.

> Nursing home residents have the following similarities: (1) They require services that may involve care of acute or subacute illness but in which chronic care needs predominate; (2) they have multiple diseases and disabilities for which care and services are needed. Medical diagnosis is but one component of assessing their care needs; (3) their physical, mental, and social well-being are closely related - mental and emotional status both affect and are affected by physical health; and (4) they can benefit from efforts to improve, maintain or prevent decline in physical functioning.The ability to function more or less independently in activities of daily living, despite disease and disability, is central to individuals' well-being (U. S. Congress Office of Technology Assessment, 1987, p. 370).

This review of related literature supported the attempt to model the relationship that outcomes of Minnesota nursing home residents have with specific controllable structural and process-related attributes of nursing home care. More knowledge about these relationships will provide a basis for recommendations that may improve the outcomes of nursing home care.

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Chapter 3

Methods

This chapter outlines the methodology for the completion of this study. It describes the research design, samples, data collection and analysis procedures.

Research design

This historical cohort study was based on a theoretical framework which proposed that outcomes of care are a product of the structure and process of care, that is: STRUCTURE + PROCESS = OUTCOMES. The intent was to estimate the effects of specific Minnesota nursing home attributes (size, ownership, noncompliance with a state correction order, nursing) on resident outcomes (functional ability, discharge home, death). Multivariate statistical procedures were used to model the relationships between nursing home attributes and resident outcomes, controlling for admission functional ability and age. Approval of the study design was obtained from the Human Investigation Committee at Rush-Presbyterian-St. Luke's Medical Center in order to assure compliance with current university research guidelines (Appendix D).

Dependent variables .

This study was designed to estimate the effects of nursing home attributes on observed resident outcomes. The observed outcomes identified as dependent variables were death, discharge home, and functional ability. Evidence of discharge home or death was on the data file. Functional ability was operationalized by calculating a Total Dependence Score (TDS) for each resident on admission and in subsequent years.

The actual TDS was the calculated value of a resident's functional ability at admission and at the time of annual quality assurance reviews. It was a summation of individual scores for eight activities of daily living: dressing (0-4);

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b) grooming (0-3); c) bathing (0-5); d) eating (0-4); e) bed mobility (0-3); f) transferring (0-4); g) walking (0-4); and h) toileting (0-6). The range of scores possible was 0-33, with a higher score demonstrating more dependency. The admission assessments were done either by a facility RN or a community RN on a pre-admission screening team. TDS used for analysis in subsequent years were completed by state-employed RNs conducting the annual quality assurance review.

Attrition bias would be the result of only including residents for whom an actual TDS could be calculated in subsequent years. It would eliminate all those who "got better" and were discharged home and those who "worsened" in some way and died. Therefore a discretionary TDS was assigned to residents who went home or died in order to realize a more representative sample for analysis. Residents who went home and residents who died were assigned a discretionary TDS: 2 for home and 35 for death. Those who went home were presumed to be quite independent since they no longer needed nursing home care and were in the community again. Those who died were presumed to be outside the realm of an actual TDS or more dependent at the time of death.

As previously reported, the functional status of each Minnesota nursing home resident is the major focus of assessment when case-mix classifications are periodically determined by registered nurses. Since case mix reimbursement has monetary ramifications for nursing homes across Minnesota, consistency and equity in the system are of great concern. This was one reason that an inter-rater reliability study of the Quality Assurance & Review [QA&R] Resident Assessment System was conducted between October of 1988 and January of 1989 (Minnesota Department of Health, 1989). The main purpose of the study was to examine the reliability of the assessment items across the state.

The total study sample consisted of 700 residents living in 13 facilities: five from the Minneapolis/St. Paul metro area, four from northern Minnesota, and four from

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southern Minnesota. Facility samples were stratified to include above-average numbers of residents with severely impaired functioning and case-mix characteristics of particular interest for reliability testing (e.g. behavior problems). Study participants included all 35 field nurses and nine Central Office (C.O.) staff. C.O."standard setters" were used as reliability check-points across the statewide system, either paired with other C.O.staff or field nurses.

Percentages of agreement between nurse raters were determined for all 11 case-mix items. Of special interest were the eight Key Activities of Daily Living items. Three of the eight had high percentages of agreement: transferring (93.9%), walking (90.4%), and dressing (85.0%). Three had agreement levels between 80 and 85%: grooming (84.0%), bed mobility (82.6%), and toileting (82.6%). The remaining two items had close to 80% agreement: eating (79.3%) and bathing (78.9%).

When the ratings were collapsed into just two categories (ADL dependencies and non-dependencies), agreements for all but one item (eating) rose to over 93%, with the bathing item attaining the highest percentage of agreement (98.3%). Dependency/non-dependency agreement for eating was 86.3%. Overall, study results indicated a high degree of reliability for the assessment system between October 1988 and January 1989.

J. Sims, Policy Analyst, Minnesota Department of Human Services, expressed confidence in the reliability of the QA&R data that were used to calculate TDS in this study. A vulnerable point would be errors made by the RN scorers but chances of raw data entry error were minimal since a mechanized system was used; forms were scanned and edits and double checks were built in.

Independent variables

The effect of specific facility attributes on resident outcomes was estimated by including them as independent

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variables. Size, ownership, licensed nursing hours and productive nursing hours per standardized resident day of all Minnesota nursing homes were obtained from the Minnesota Department of Human Services Long-Term Care Management Division staff. This division receives information from nursing homes yearly and completes Facility Profiles (Appendix E). Evidence that certain nursing homes had not complied with a state correction order and were assessed a fine was obtained from the U. S. Department of Health and Human Services' publication entitled Medicare/Medicaid Nursing Home Information, Minnesota 88/89. The admission TDS and the resident's age were included in each analysis to control for their effect on the dependent variables.

Predicted variable relationships

The dependent variable in the linear regression model was the resident's TDS with a discretionary TDS assigned to residents who went home or died. It was posited that a resident's TDS at a given time "t" would be a function of:

1) The resident's score at time "t-1" or " t-3". This suggests that dependency over time, follows a first order model. This approach argues that the most recent historical characteristics are the most relevant. Similarly, one could contend that any process of physical deterioration or improvement may be relatively gradual and 'smooth'.
2) The size of the facility in 1988. One argument suggests that smaller homes are more 'caring'. A counter argument exists that larger facilities might experience economies of scale that facilitate 'caring'.
3) The ownership of the facility in 1988. Proprietary status may have measurable consequences. Whether for-profit homes are more or less effective than not-for-profit homes is the crux of the question, prompting this variable inclusion.

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4) Noncompliance with state correction order in 1988 or 1989. These homes were assessed a fine; one could assume these homes were not as concerned about meeting the rules of nursing home regulation.
5) Resident's age. Death and decreased functional ability are likely to increase with age.
6) The "intensity" of nursing care provided in a facility. More licensed nursing hours have been associated with positive resident outcomes.

The first five variables were utilized to capture as much variance in outcome as possible, without considering nursing care. This should ensure that outcome differences associated with varying levels of nursing care can, in fact, be attributed to that care in a straightforward manner. In other words, specific non-nursing exogenous effects would be controlled for by the inclusion of these five variables.

The last variable, central to this analysis, was nursing care. There were two critical elements with respect to the way nursing care were positioned in this relationship. First is the assumption that the positive effects of care must be preceded by a period of given care. In effect, there is a 'lag' between the treatment and its effect. This temporal sequencing form was specified in a manner whereby the TDS at time "t" was affected by the intensity of care received at a previous time. The argument, simply, is that more licensed nursing hours would yield results over a period of time as opposed to instantaneously.

The second issue with respect to nursing care was a measurement concern. The sample data contained two categories of nursing care. One was licensed nursing hours [LNH], which were the registered and licensed practical nursing hours per standardized resident day and the other was productive nursing hours [PNH], which were the licensed and unlicensed nursing hours [UNH] per standardized resident day. In essence, one could examine the effect of care of higher educated or a combination of higher educated and less

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educated nursing personnel. The empirical problem that developed was that there appeared to be a form of tradeoff involved in the provision of these services. These two forms of care seemed to be treated as crude substitutes. The rate of substitution in the sample was around 0.4, which means that a 10 per cent increase in PNH was associated with a 4 per cent decrease in LNH. Given this, it would be difficult to isolate an effect for licensed nursing hours.

The substitution issue necessitated a functional form for the nursing variable that would capture the effects related to variations in the mix of licensed and unlicensed nursing hours. A measure was chosen that reflected the relative "richness" of the mix in a given facility. The functional form for a higher intensity of nursing [Hi Int nursing] adjusted for the ratio of LNH/PNH and the total amount of nursing hours PNH or (1+ LNH/PNH) x PNH. Hi Int Nursing then equals 2LNH + UNH.

The estimating equation was:

$$\text{Total Dependence Score}_{t} = b_0 + b_1 \text{TDS}_{t-1 \text{ or } t-3} + b_2 \text{Size} + b_3 \text{Ownership} + b_4 \text{Noncompliance} + b_5 \text{Age} + b_6 \text{Nursing}_{t-1 \text{ or } t-1 + t-2 + t-3} + E_t$$

where:

b_0 = the intercept constant;

Total Dependence Score (TDS) = the calculated value of a resident's functional ability at the time of the annual quality assurance review the year following admission and three years later for 1988 admissions. The range of scores possible for residents still in the nursing home was 0-33, with the higher scores demonstrating more dependency with specific activities of daily living.

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A score of 2 was assigned to those residents who were discharged home and 35 to those who died;
TDS t-1 = TDS from the previous year or
TDS t-3 = TDS from 1988 when TDS 1991 is dependent variable;
Size = number of beds in the facility;
Ownership = dummy variable where 0 = not-for-profit, 1 = for-profit;
Noncompliance = dummy variable where 0 = did not receive correction order or complied with it in 1988 or 1989, 1 = fined for noncompliance with correction order;
Age = resident's age;
Nursing t-1 = Hi Int nursing in the previous year and in 3 previous years for TDS in 1991 for admissions in 1988;
E t = a standard normal residual.

It was also posited that discharge home or death in the same year as admission would be a function of the same facility attributes and age. Equations that estimate this relationship indicated the effects of facility attributes on the probability of residents being discharged home or dying in the same year as admission, relative to the omitted outcomes of not going home and not dying (1 = discharged home, 0 = not discharged home and 1 = dead, 0 = not dead). Since these dependent variables are categorical rather than linear, a nonlinear probability model estimated the effects of facility attributes on the outcome probability.

The estimating equations were:

Discharged home or death =

$$b_0 + b_1 TDS_{t-1} + b_2 Size + b_3 Ownership$$
$$b_4 Noncompliance + b_5 Age + b_6 Nursing_{t-1} + E_t$$

where:

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TDS, size, ownership, noncompliance, age, nursing, b_0 and E_t are defined in the same manner as for the first equation.

Sample

Computerized tapes containing four years (1988-1991) of nursing home resident data were obtained from the MDHS. In each of these years there were over 25,000 admissions to Minnesota nursing homes, but only 10,639 were entered on this file in 1988. New admissions, 65 years of age and older, in each of three years (1988 to 1990), were eligible for selection as subjects. Therefore specific resident outcomes were accessible for relating to facility attributes.

The samples for least squares regression analysis numbered 6099 in 1989; 20,187 in 1990; and 20,191 in 1991. Also a sample of 5722 was accessible for regression analysis of the TDS in 1991 for admissions in 1988. Available computer memory necessitated a random selection of only 50 per cent of the 1988 admissions and 20 per cent of the 1989 and 1990 admissions for non-linear probability analysis, yielding samples of 4103, 4676, and 4672.

In order to maintain confidentiality, MDHS staff assigned a pseudo-identification number to each resident prior to sharing the data. This new number was then consistent throughout the data and it was possible to match residents with their facilities by using Minnesota Department of Health location code numbers entered into the nursing home data file by the researcher.

Data processing and analysis

The nursing home resident data was transferred from the MDHS tapes to the mainframe computer system at Mankato State University. The four files (1988 through 1991) were sorted by resident identification numbers. All records that were coded New admission or Preadmission screening were selected from the 1988-1990 files in order to calculate the admission TDS.

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A reduced data set was created for each of the remaining years by selecting only those records which were coded Quality Assurance Review (for calculation of an actual TDS in the years following admission), Deceased or Home. These data sets were merged for analysis.

The nursing home attributes were entered into a separate file. A system file was created which allowed matching of the nursing home file with the file of residents who were 65 years of age and older, using facility location numbers.

Least squares regression analysis (SPSS-X) estimated the simultaneous and individual effects of the four nursing home attributes, the admission TDS and age on the following year's TDS (including discharges home and death), for admissions in 1988, 1989, and 1990. The 1991 TDS was also a dependent variable for admissions in 1988. The F-statistic was the test of significance for the multiple regression results and the t-statistic determined the significance of the individual variable effects.

Admissions in 1988, 1989, and 1990 were used for maximum likelihood estimation, a procedure for analyzing relationships between independent variables and categorical dependent variables. The probabilities of discharge home and death were estimated as functions of the four nursing home attributes, admission TDS and age. PROBIT (SPSS-X) estimated the independent variable regression coefficients. The coefficients divided by the standard errors yielded the t-statistic for determining the significance of the independent variable effects.

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Chapter 4

Results and Discussion

This chapter presents the results and discussion of the analysis of data concerning Minnesota nursing homes residents and the facilities in which they lived between 1988 and 1991. Sixty-seven per cent of the 440 nursing homes in 1988 were located in Greater Minnesota; 18 per cent were in suburbs of Minneapolis and St. Paul; 15 per cent were in Minneapolis and St. Paul.

The 1988 resident data file included 10,639 admissions to Minnesota nursing homes. There were actually over 25,000 admissions but not all had been entered on the file. Admissions in 1988 who were 65 years of age and older numbered 8261, with 19 per cent 65 to 74 years, 35 per cent 75 to 84 years, 38 per cent 85 to 94 years and 8 per cent 95 to 107 years of age. Approximately 355 of these residents were still in the nursing home in 1991.

Seventy-five per cent of nursing homes nationally were for-profit in 1985 (Kissick and Knibbe, 1989). Only 40 per cent of the 440 Minnesota nursing homes were for-profit in 1988 and 14.8 per cent did not comply with a correction order in 1988 or 1989. These homes ranged in size from 5 to 559, with a mean of 105 beds.

The number of licensed nursing hours (LNH) and productive nursing hours (PNH) per standardized resident day in the 440 homes varied a great deal. The ranges of LNH follow: 1988 (.050 - 2.614), 1989 (.131 - 3.3), 1990 (.125 - 2.035). The ranges of PNH follow: 1988 (.339 - 3.99), 1989 (.391 - 3.30), 1990 (.405 - 3.86).

Thirty-nine per cent of the 303 homes which housed a sample that was followed from 1988 to 1991 were for-profit, and 14.5 per cent did not comply with a correction order. These homes ranged in size from 21 to 559, with a mean of 114. A description follows of the 1988 admissions whose

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actual TDS were accessible from 1988 to 1991. Table 1 describes this sample by comparing the case-mix classifications for years 1988 to 1991 and includes the overall difference in the classifications between 1988 and 1991 (refer to Appendix C). The greatest decreases were in Classifications A and D; the greatest increases were in Classifications H and J, demonstrating that the trend was for residents to require more attention from nursing staff for various reasons such as increased assistance with KADL, special treatments or clinical monitoring.

Table 1. Case-mix Classification (1988 - 1991)

Classification	1988	1989	1990	1991	Difference 1988 to 1991
A	235	246	229	182	- 53
B	71	56	60	65	- 6
C	3	1	2	2	- 1
D	129	71	67	84	- 45
E	54	55	64	67	+ 13
F	10	0	2	2	+ 8
G	158	137	128	129	- 29
H	29	54	66	88	+ 59
I	22	23	30	37	+ 15
J	25	44	80	107	+ 82
K	46	11	12	19	- 27
	n = 782	n = 698	n = 740	n = 782	n = 782

Table 2 lists the TDS statistics for the three years. The scores ranged from 0 to 33 on admission and from 0 to 31 in 1991. The mean TDS increased from 14 to 17; the median increased from 13 to 18. This information reiterates the overall trend of an increased functional dependency of these nursing home residents, requiring more nursing assistance.

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Table 2. Total Dependence Score Statistics (1988 - 1991)

TDSs	1988	1989	1990	1991
Mean	14	14	16	17
Mode	6	5	5	5
Median	13	13	15	18
Range	0-33	0-31	0-32	0-31
	n = 782	n = 698	n = 740	n = 782

The 1989 and 1990 resident data files included 25,677 and 25,806 respectively. Residents 65 years of age and older that were admitted in 1989 and 1990 numbered 23,411 and 23,400 respectively. The percentage of these residents in two age categories were similar to the 1988 admissions but there were approximately eight per cent more in the 75-84 years grouping and four per cent less in the 95 years and over grouping.

Table 3 includes the results of least squares regression analysis on the following year's TDS of those residents admitted to Minnesota nursing homes in 1988, 1989, and 1990. Table 4 lists the regression results for the 1991 TDS of residents admitted in 1988. The Beta coefficients, t values (in parentheses) and significance of the relationships of the independent variables to the TDS are presented.

The empirical analysis yielded a number of interesting findings. As these tables indicate, the estimated regression equations were significant ($p < .001$). Adjusted R^2 values ranged from .12 for the 1989-1990 sample to .21 for the 1988-1991 sample. Although there were some variations in the estimated effects among the sample years, specific relationships were remarkably consistent.

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Table 3. Regression: TDS One Year Following Admission

	1989	1990	1991
Admission TDS	.77085*** (34.84)	.55142*** (44.645)	.63182*** (50.66)
Age	.25964*** (34.84)	.26814*** (20.65)	.24243*** (19.14)
Hi Int Nursing	-.00754*** (-15.74)	-.00563*** (-17.83)	-.00758*** (-23.18)
Size (1988)	.002019 (.956)	-.00075 (-.684)	-.00179 (-1.67)
Ownership (1988) 0 = Not-for-profit 1 = For-profit	-.75961 (-1.945)	-.92523*** (-4.53)	-.7936*** (-3.88)
Compliance (1988/89) 0 = Yes, 1 = No	-.29898 (-.613)	.46928 (1.81)	.19882 (.766)
Constant	12.766*** (12.03)	18.31*** (29.23)	18.345*** (28.36)
N	6099	20,187	20,191
Adjusted R^2	.20	.12	.14
F value	260.17***	453.11***	568.10***

*** $p < .001$.

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Table 4. Regression: TDS in 1991 (1988 Admissions)

1988 TDS	.78168*** (34.52)
Age	.22519*** (9.36)
Hi Int Nursing 1988 + 1989 + 1990	-.001916*** (-16.86)
Size (1988)	.000455 (.211)
Ownership (1988) 0 = Not-for-profit 1 = For-profit	-.97492* (-2.44)
Compliance (1988/89) 0 = Yes, 1 = No	.28412 (.571)
Constant	7.843*** (9.60)
Adjusted R^2	.21
N	5722
F value	255.174***

* $p < .05$. *** $p < .001$.

The first of these findings was that a resident's functional ability in a given year was strongly associated with their functional ability in a previous year. In all tested situations, a resident's functional ability was a positive function of a previous year's functional ability ($p < .001$). This suggests that functional dependencies increase monotonically over time or that capabilities decline in a similar fashion. This finding was not surprising since previous studies have had similar results.

The second consistent result was the positive relationship between increasing age and decreasing functional

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ability ($p < .001$). This variable was included because of this expectation. The third consistent result was the negative relationship between Hi Int Nursing and the dependency of the residents after their first year of care. In all samples, Hi Int nursing hours were consistently associated with lower levels of resident dependency ($p < .001$). More hours of Hi Int nursing care are significantly related to an improvement in the functional ability of those receiving it.

The relationship of the size of a nursing home to improved functional ability was not clear. A larger size was associated with decreased functional ability of 1988 admissions in 1989 and 1991 but was associated with improved functional ability of residents admitted in 1989 and 1990. However these results were not significant.

There was a positive relationship between for-profit status of nursing homes and improved functional ability of residents in each sample. This relationship was significant in the 1990 sample ($p < .001$) and both 1991 samples ($p < .001$ and $p < .05$). It appears that a "bottom-line orientation", which is the public's perception of a for-profit organization, can be associated with improved functional ability. Minnesota has rigorous regulatory practices, particularly in the context of Medicaid standards, which may limit profit-maximizing activities. However it is difficult to interpret these results since the researcher is aware that some of these homes were sold and no longer had for-profit status after 1988.

Noncompliance with a state correction order and being assessed a fine in 1988 or 1989 was not significantly associated with future functional ability in this study. Subsequent designations of noncompliance with state correction orders were not accessible in the same manner, so they could not be included in the analysis.

Interpretations of the individual variable regression coefficients were cautiously made, since all resident

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characteristics and facility attributes that influence outcomes were not included in the estimating equation.

Tables 5 and 6 include the results of nonlinear probability analysis which estimated the effects of facility attributes and a resident's age on the likelihood of discharge home or death in the same year as admission. Parameter estimates (coefficients), t values (in parentheses) and significance of the relationships of the independent variables to discharge home or death are presented in these tables.

Table 5. Parameter Estimates: Probability of Discharge Home

	1988	1989	1990
Admission TDS	-.036*** (-15.64)	-.019*** (-7.95)	-.019*** (-7.94)
Age	-.0123*** (-5.5)	-.024*** (-9.91)	-.0265*** (-11.00)
Hi Int Nursing	.00043*** (9.714)	.00051*** (9.112)	.00061*** (11.025)
Size (1988)	.00013 (.649)	-.00011 (-.526)	.00048* (2.54)
Ownership (1988) 0 = Not-for-profit 1 = For-profit	.00414 (.1093)	.0564 (1.44)	.0599 (1.56)
Compliance (1988/89) 0 = Yes, 1 = No	-.076 (-1.69)	-.0358 (-.742)	-.0019 (-.0401)
Intercept	4.743*** (48.9)	4.228*** (37.4)	4.09*** (36.9)
N	4103	4676	4672

* $p < .05$. ** *$p < .001$.

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Table 6. Parameter Estimates: Probability of Death

	1988	1989	1990
Admission TDS	.06415*** (21.1)	.0313*** (15.43)	.0357*** (16.85)
Age	.00401 (1.40)	.0177*** (8.57)	.0173*** (8.23)
Hi Int Nursing	-.00034*** (-5.35)	-.00034*** (-6.29)	-.00040*** (-7.125)
Size (1988)	-.0000 (-.01505	.00012 (.659)	-.00007 (-.409)
Ownership (1988) 0 = Not-for-profit 1 = For-profit	-.0608 (-1.257)	-.1035** (-3.22)	-.135*** (-4.05)*
Compliance (1988/89) 0 = Yes, 1 = No	-.0414 (-.696)	.026 (.652)	.006 (.145)
Intercept	3.58*** (25.5)	4.65*** (45.1)	4.59*** (42.9)
N	4103	4676	4672

** $p < .01$. *** $p < .001$.

The admission TDS and older age significantly estimated a decreased likelihood of discharge home in all three samples ($p < .001$) while a higher intensity of licensed nursing hours significantly estimated an increased likelihood ($p < .001$). These results were countered by the opposite relationships with the likelihood of death in all samples. More advanced age estimated an increased likelihood of death, significantly in 1989 and 1990 ($p < .001$), and a higher intensity of licensed nursing hours significantly estimated a decreased likelihood of death ($p < .001$).

The results related to size of nursing homes were not the same in all samples. A larger number of nursing home beds estimated an increased likelihood of discharge home and

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a decreased likelihood of death in 1988 and 1990 while opposite relationships were estimated in 1989. The only significant relationship was the increased likelihood of discharge home in 1990 ($p < .05$).

For-profit status estimated an increased likelihood of being discharged home and a decreased likelihood of death in all samples. The significant estimations were a decreased likelihood of death in 1989 ($p < .01$) and 1990 ($p < .001$). For-profit facilities may be more efficient and effective in the delivery of care. As reported previously, it is difficult to interpret these results since the researcher is aware that some of these homes were sold and no longer had for-profit status after 1988.

Noncompliance with a state correction order in 1988 or 1989 did not significantly estimate the likelihoods of discharge home or death in any of the samples. The direction of the relationship was not even consistent for the probability of death. As previously reported, subsequent designations of noncompliance with state correction orders were not accessible, so they were not included in the analysis.

It was not surprising that a previous functional ability score and age were significant predictors of future resident functional outcomes. Unexpected findings were that nonprofit status was a significant predictor of improved functional ability in three of four samples and a significant estimator of a decreased likelihood of death in two of three samples. The hypothesized beneficial effect of a higher intensity of licensed nursing hours was found to be significant.

It cannot be stated that a higher intensity of licensed nursing hours or the other significant predictors actually cause beneficial outcomes. An interaction effect of the variables in these predictive equations must be considered. Two or more of the independent variables may be acting in combination (interactively) rather than as unconnected

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factors. Also the significant predictors may be proxies for other variables or combinations of other variables.

Several of Mezey's (1989) concerns about the use of outcome criteria in quality of care research were addressed in this study. Patient status changes that were detectable were the dependent variables. Since these status changes/outcomes were variable and could fluctuate between data collection points, the longitudinal methodology was appropriate. Size, ownership and a staffing pattern measure were included as independent variables. Nursing, medical and behavioral problems were not controlled in this study, however case-mix was partially controlled by including a previous TDS as a covariant. Another covariant included was the resident's age which was expected to be related to the outcomes.

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Chapter 5

Summary and Recommendations

The results of this study challenge public opinion that physical decline and death are inevitable after admission to a nursing home in Minnesota. On the contrary, many residents' functional abilities improve and many are discharged home. The significance of a previous TDS in the prediction of future scores supports previous findings of this effect. Another expected and realized finding was the significant association between a resident's age and decreased functional ability, decreased likelihood of discharge home and increased likelihood of death.

The inconsistent relationship of nursing home size and ownership to specific beneficial outcomes concurs with previous study results. However for-profit status was significantly associated with a decreased likelihood of death in three samples. Specific results of this study support the hypothesis that was proposed: Improved functional ability and discharge home are more likely to occur as a result of a higher intensity of licensed nursing hours in Minnesota nursing homes.

Study results demonstrated the therapeutic potential of a higher intensity of licensed nursing hours in Minnesota nursing homes. A higher intensity was significantly associated with improved functional ability of Minnesota nursing home residents. Also it was significantly associated with an increased likelihood of discharge home and decreased probability of death in the same year as admission. These beneficial outcomes for nursing home residents who were served by more licensed nurses demonstrate the value of licensed nursing practice in this setting. Nursing assistants are not substitutes for licensed nurses when the obvious

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goals of improved functional ability, discharge home and staying alive are intended.

When implementing the Omnibus Budget Reconciliation Act of 1987 (OBRA) requirement for increased nursing staff, nursing home administrators should increase their licensed staff instead of their unlicensed staff. An increased proportion of LNH may not dramatically increase cost for a given year, but may improve the functional ability of the residents and increase the probability of discharge home. Even a small improvement in a resident's functional status is a significant outcome of nursing home care. In addition, Spector and Jackson (1994) suggest that a reduction in the number of behavior problems may be the result of the prevention of dysfunction in basic activities of daily living.

Another requirement of OBRA is the development and use of tools for measuring the quality of resident care, with a focus on resident outcomes. Outcomes are comprehensive and reflect previous action. Improved functional status and discharge home are objective outcomes but there is no guarantee that an outcome can tell what may have gone right or wrong, and who or what is responsible. However, this research indicates that more licensed nursing hours are related to beneficial outcomes. The reliability and validity of the outcomes in this study were reinforced when similar results were demonstrated over a three-year period.

When focusing on specific beneficial outcomes of care such as improved functional status and discharge home, one must also consider the influence of factors other than the variables included in a limited study. Outcomes are likely to be related to existing diagnoses and the presence of risk factors for other potential illnesses. However these were not known for the residents in this study and therefore not controlled. Other influencing factors must be acknowledged: physical, psychosocial, and organizational and personal environments (Kayser-Jones, 1989), and the influence of all

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people that residents come in contact with on a daily basis, (e.g., physicians, staff, family, other residents).

Kayser-Jones (1989) emphasized, however, that the most important factor that promotes the well-being of institutionalized elderly are the characteristics of the nursing staff and "the nurse must be involved in all aspects of the environment - the physical, the organizational, the personal, and the psychosocial milieu" ..... "Human relationships - the bond between nurse and patient - are more important than the physical surroundings" (p. 105-106).

The nursing home industry pre-OBRA evaluated care from the perspective of negative harm; if nothing negative occurred, a facility was in compliance with standards. Perhaps nothing bad happened such as developing a pressure sore, but something good may not have happened either. "Not developing a pressure sore may be good care but it is not sufficient. OBRA attempts to ensure that residents do not experience "positive harm" (i.e., failure of a resident to achieve the highest practicable level of function)" (Ousley, 1992, p. 29).

OBRA regulations and this research substantiate the need for more RNs who will use the nursing process to systematically assess residents, make nursing diagnoses, plan care and evaluate outcomes. "Federal and state laws require that nursing homes and services meet certain minimum standards and that reimbursement take into account costs of services required to attain or maintain the highest practicable physical, mental and psychosocial well-being of each resident" (Osell, 1993). Significant annual rate increases, often in excess of the consumer price index, are the result of revised standards, their enforcement and the state's reimbursement policy. On average in Minnesota, nursing home rates increased about 8 per cent between July 1992 and July 1993.

Osell (1993) also reported that Minnesota's reimbursement system follows health-care inflation through

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the use of a national index for nursing homes. Each nursing home's actual spending for operations and capital expansion for the prior year are the basis for the next year's rate. Annually, nursing homes receive new MA rates that reflect actual spending increases and expected inflation.

Reimbursement policy reform should include improved reimbursement for professional nursing services in nursing homes (Aiken, 1989). Registered nurses could then take on expanded responsibilities which have been shown to enhance resident outcomes and reduce unnecessary use of hospital care. Residents are not expected to deteriorate unless it is unavoidable. Registered nurses are qualified to complete comprehensive resident assessments that will lead to plans of care that involve the resident, staff and family and aim toward realistic beneficial outcomes. Professional nurses are more likely to practice in a manner that insures that the nursing home industry is driven by residents' needs and concerns.

Increased licensed nurse staffing may be unrealistic since 18.9 per cent of the RN positions in nursing homes were vacant in 1989 (ANA, 1990) and nursing homes are expected to need 125 per cent more registered nurses and 142 per cent more practical nurses by the year 2000 (Wilging, 1990). Maraldo (1991) provided an estimation of only 1.5 licensed health care providers per 100 nursing home residents - in contrast to one RN for every 4.5 patients in hospitals. Lower wages, estimated at 15 per cent below the salary level of hospital nurses, put nursing home administrators at a disadvantage for hiring professional nurses, and retaining them over time.

Adding to this disadvantage of lower wages is the assumption of many nurses that their skills will not be used as effectively in long-term care settings as in acute-care settings. Registered nurses who choose to work in nursing homes deserve increased wages and benefits to compensate them

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fairly for their skillful and meaningful contribution to the care of the elderly.

Several years ago, Vladeck (1980) proposed a plan for nursing home bed capacity reduction, believing that this reduction could introduce qualitative competition within the nursing home industry. Capacity reduction has not occurred and there still is no incentive for nursing homes that rely heavily on MA reimbursement to provide anything other than the minimum necessary to escape regulatory sanctions. A likely reason that bed reduction has not occurred is that long-term care is frequently based on affordability rather than need, and financing has formed the long-term care system (Mitchell, 1989).

Reimbursement for services has also driven the setting in which Minnesota's elderly have received necessary care for many years. Minnesota will probably maintain its moratorium on the number of available nursing home beds and has not yet proposed a reduction. More emphasis is being placed on lower cost alternative services that allow older people to remain in their homes (i.e. home health care, adult day care, respite care).

If an attempt was made to classify the existing nursing homes into broad qualitative groups, as Vladeck (1980) suggested, those homes close to the bottom of the ranking could be under threat of closure or bed reduction and would have a substantial incentive for qualitative improvements. This study supports the recommendation that one of these improvements be the addition of more licensed nursing positions when planning the staffing patterns for nursing care.

There are many more questions to be answered and hypotheses to be tested related to Minnesota nursing home residents and the facilities in which they live. Does a higher intensity of licensed nursing hours significantly increase the cost of operating a facility in a given year? Are residents in homes that have a higher intensity of

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licensed nursing hours more satisfied with the care they receive? What other variables are significant predictors of beneficial outcomes for nursing home residents? What interaction effects exist between variables that predict outcomes?

Future research attempting to answer these questions and others will further delineate this study's theoretical proposal that structure plus process equals outcomes in the nursing home setting. An empirical understanding of the interaction of structure and process-related attributes of care and their contribution to a variety of outcomes will lay the groundwork for improvement in the regulation, reimbursement and quality of nursing home care.

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APPENDICES

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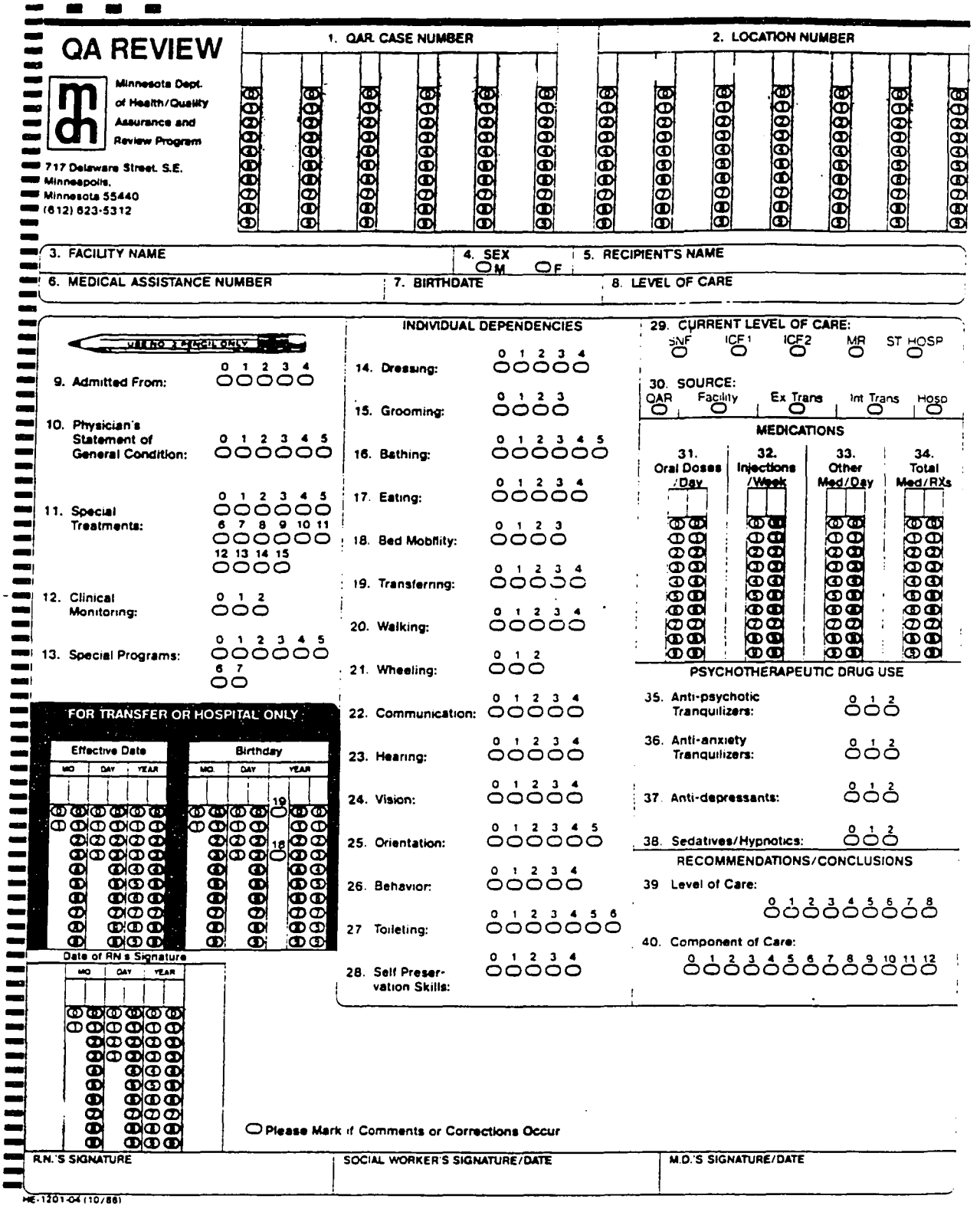
Appendix A



QA REVIEW

Minnesota Dept. of Health/Quality Assurance and Review Program

717 Delaware Street S.E.
Minneapolis,
Minnesota 55440
(612) 623-5312

1. QAR CASE NUMBER

2. LOCATION NUMBER

3. FACILITY NAME

4. SEX ○M ○F

5. RECIPIENT'S NAME

6. MEDICAL ASSISTANCE NUMBER

7. BIRTHDATE

8. LEVEL OF CARE

MEDICAID & MHCP ONLY

9. Admitted From: 0 1 2 3 4

10. Physician's Statement of General Condition: 0 1 2 3 4 5

11. Special Treatments: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

12. Clinical Monitoring: 0 1 2

13. Special Programs: 0 1 2 3 4 5 6 7

FOR TRANSFER OR HOSPITAL ONLY

Effective Date (MO / DAY / YEAR)

Birthday (MO. / DAY / YEAR) 19 18

Date of RN's Signature (MO / DAY / YEAR)

INDIVIDUAL DEPENDENCIES

14. Dressing: 0 1 2 3 4

15. Grooming: 0 1 2 3

16. Bathing: 0 1 2 3 4 5

17. Eating: 0 1 2 3 4

18. Bed Mobility: 0 1 2 3

19. Transferring: 0 1 2 3 4

20. Walking: 0 1 2 3 4

21. Wheeling: 0 1 2

22. Communication: 0 1 2 3 4

23. Hearing: 0 1 2 3 4

24. Vision: 0 1 2 3 4

25. Orientation: 0 1 2 3 4 5

26. Behavior: 0 1 2 3 4

27. Toileting: 0 1 2 3 4 5 6

28. Self Preservation Skills: 0 1 2 3 4

29. CURRENT LEVEL OF CARE: ○SNF ○ICF1 ○ICF2 ○MR ○ST HOSP

30. SOURCE: ○OAR ○Facility ○Ex Trans ○Int Trans ○Hosp

MEDICATIONS

31. Oral Doses /Day	32. Injections /Week	33. Other Med/Day	34. Total Med/RXs

PSYCHOTHERAPEUTIC DRUG USE

35. Anti-psychotic Tranquilizers: 0 1 2

36. Anti-anxiety Tranquilizers: 0 1 2

37. Anti-depressants: 0 1 2

38. Sedatives/Hypnotics: 0 1 2

RECOMMENDATIONS/CONCLUSIONS

39 Level of Care: 0 1 2 3 4 5 6 7 8

40. Component of Care: 0 1 2 3 4 5 6 7 8 9 10 11 12

○ Please Mark if Comments or Corrections Occur

R.N.'S SIGNATURE

SOCIAL WORKER'S SIGNATURE/DATE

M.D.'S SIGNATURE/DATE

HE-1201-04 (10/88)

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Appendix B

INDIVIDUAL DEPENDENCIES

For a coding under Individual Dependencies, the medical record must establish that:

a) The physician has performed a medical evaluation of the resident that includes a review of the resident's physical and cognitive impairments as they relate to the individual's dependency;

b) A registered nurse has assessed the functional status of the resident;

c) In coordination with the other resident care disciplines providing care, a written plan of care is developed and maintained by the nursing service consonant with the medical plan of care; and

d) The physician has approved the plan of care and has documented periodic reassessment of the resident's status.

14. **DRESSING**

0 = Dresses without help of any kind

1 = Needs and receives supervision or programming (MR). Record for resident who receives assistance to lay out clothes, fasten clothing, or whose performance is being monitored.

2 = Needs and receives help from another person to put on clothing (resident participates).

3 = Is dressed (unable to participate).

4 = Never dressed

15. **GROOMING**

0 = Grooms self without help of any kind

1 = Needs and receives supervision or programming (MR).

2 = Needs and receives daily help from another person.

3 = Is groomed (unable to participate).

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16. **BATHING**

0 = Bathes without help of any kind.

1 = Needs and receives minimal supervision or programming (MR) in bathing.

2 = Needs and receives supervision only.

3 = Needs and receives help in and out of tub.

4 = Needs and receives personal help washing and/or drying body.

5 = Is bathed (unable to participate).

17. **EATING**

0 = Feeds self without help of any kind.

1 = Needs and receives minimal supervision (reminders) or programming in eating.

2 = Needs and receives personal assistance from direct care staff to cut meat, arrange food, butter bread, etc. at the time the meal is delivered to the resident.

3 = Needs and receives partial feeding from another person. Includes observation for choking or inappropriate behavior (taking food from others, throwing food).

4 = Needs and receives total feeding from another person, tube feeding, or intravenous feeding.

18. **BED MOBILITY**

0 = Moves self in bed without help.

1 = Needs and receives occasional help from another person to sit up.

2 = Always needs and receives help from another person to sit up.

3 = Needs and receives turning and positioning.

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19. **TRANSFERRING**

0 = Transfers without help of any kind.

1 = Needs and receives guidance only. Requires physical presence of another person during transfer.

2 = Needs and receives physical aid of one person.

3 = Needs and receives aid of two persons or mechanical device (unable to participate).

4 = Remains bedfast.

20. **WALKING**

Guidance to a destination does not constitute a dependency in walking.

0 = Walks without help of any kind.

1 = Needs and receives the help of a device (cane, walker, crutch).

2 = Needs and receives the personal help of one person.

3 = Needs and receives the personal help of two persons.

4 = Unable to walk.

27. **TOILETING**

Code the appropriate number except if resident has a catheter and is continent of bowel, code 0. If resident has an ostomy and is continent of urine, code 0. If a continent resident with a catheter or ostomy needs and receives help to toilet, code 1.

0 = Independent. (Include the resident who manages the problem of dribbling.)

1 = Needs and receives help to toilet, no incontinence.

2 = Occasional incontinence, not more than once a week. (Include the resident who receives help with dribbling.)

3 = Nocturnal incontinence only.

4 = Incontinent bladder, more than once a week.

5 = Incontinent bowel, more than once a week.

6 = Incontinent bowel and bladder.

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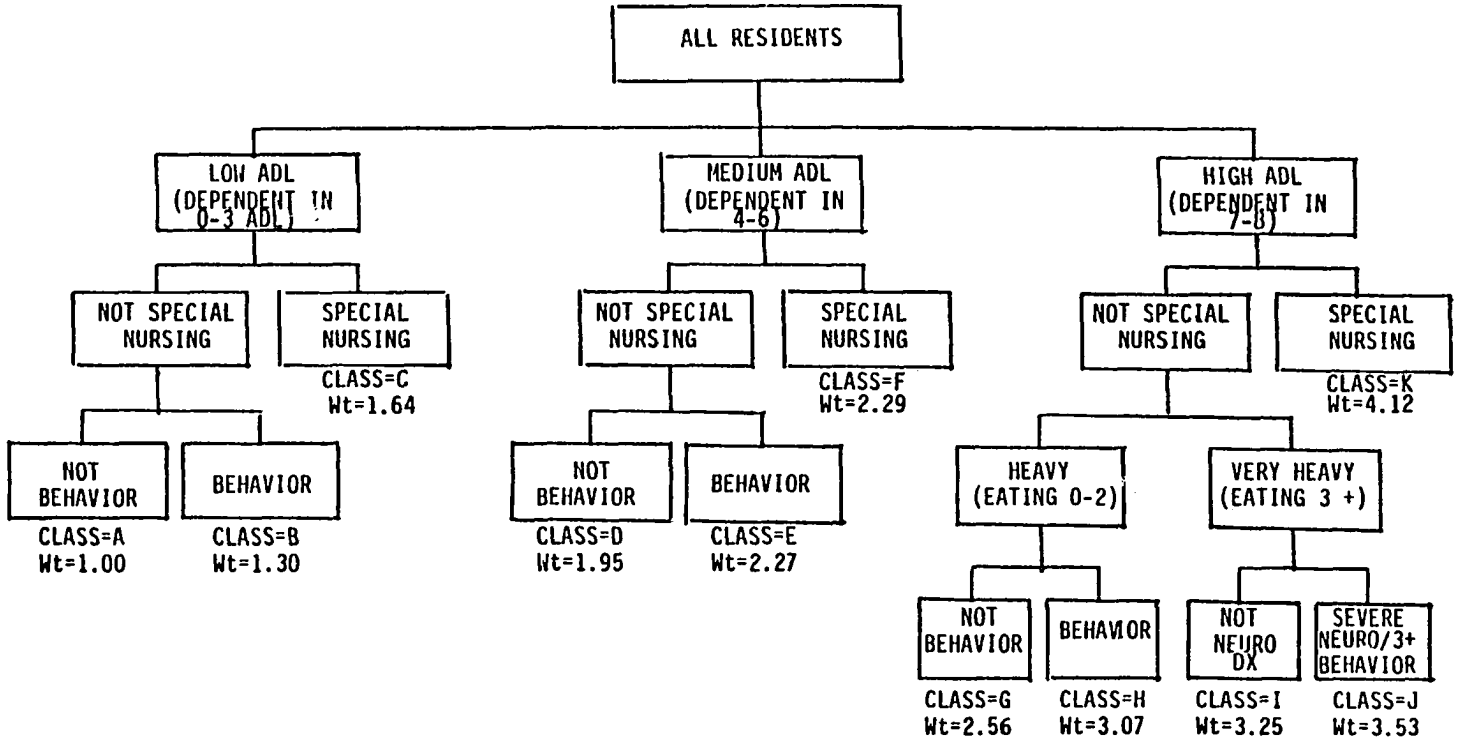
RESIDENT CLASSIFICATION SYSTEM

Decision Tree



Key Activities of Daily Living (ADL's)

	Not Dependent	Dependent
Dressing	0-1	2-4
Grooming	0-1	2-3
Bathing	0-3	4-5
Eating	0-1	2-4
Bed Mobility	0-1	2-3
Transferring	0-1	2-4
Walking	0-1	2-4
Toileting	0	1-6

Classification	Weight (Relative Resource Use)
A Low ADL	1.00
B Low ADL Behavior	1.30
C Low ADL Special Nursing	1.64
D Medium ADL	1.95
E Medium ADL Behavior	2.27
F Medium ADL Special Nursing	2.29
G High ADL	2.56
H High ADL Behavior	3.07
I Very High ADL (Eating 3-4)	3.25
J High ADL Severe Neurological Impairment/3+Behavior	3.53
K High ADL Special Nursing	4.12

Appendix D

RUSH-PRESBYTERIAN-ST. LUKE'S MEDICAL CENTER

HUMAN INVESTIGATION COMMITTEE

Research, Education, or Service Activities NOT Involving Human Subjects

INVESTIGATOR(S): Mary Bliesmer, RN, MPH

DEPARTMENT: Community Health Nursing SECTION: (DNSc STUDENT)

TITLE OF PROJECT: Functional Outcomes of Minnesota Nursing Home Residents and their Relationship to Facility Structural and Process-related Elements

FUNDING SOURCE: *(If NIH, specify agency)* N/A

PROJECT PERIOD: Fall 1992 through Summer 1993

We hereby certify that this program/protocol does not involve clinical investigation using human subjects.

SIGNATURE: [redacted]
Principal Investigator Mary Bliesmer

SIGNATURE: [redacted]

SIGNATURE: [redacted]

SIGNATURE: [redacted]
Cheryl Easley

Please type name of persons signing under signature line. Two copies of the program/protocol must accompany this form.

APPROVED [redacted] DATE: 1-15-93
Janet M. Wolter, M.D., Chairperson

A copy of this form (with appropriate institutional signature) will be returned to the investigator. Please retain a copy for your files.

2/87

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L T C F A C I L I T Y P R O F I L E
DHS - LTC MGMT DIVISION

002697X GOOD SAMARITAN CENTER OWNERSHIP: NON-PROFIT
REPORT YEAR: 90 COUNTY :
GEO. GRP.: 2

	9/30/89	9/30/90	% CHANGE	GRP %TILE	MN %TILE
C&NC					
SLOS					
RULE 80					
CHG OWN					
LIC. NH AND BC BEDS	79	79	0.00		
--NURSING HOME	79	79	0.00		
--BOARDING CARE	0	0	0.00		
CERTIFIED BEDS	79	79	0.00		
--SKILLED	0	0	0.00		
--ICF-I	79	79	0.00		
--ICF-II	0	0	0.00		
LICENSED CAPACITY	28,835	28,835	0.00		
PRIVATE ROOM ADJ. DAYS	0	5,110	0.00		
RESIDENT DAYS	28,587	28,595	0.03		
STANDARDIZED DAYS	60,013	57,557	-4.09		
CASE MIX SCORE	2.099	2.013	-4.12	9.89	15.28
--NH CASE MIX SCORE	2.099	2.013	-4.12		
--BC CASE MIX SCORE	0.000	0.000	0.00		
OCCUPANCY PERCENT	99.140	99.168	0.03	82.97	80.90
--NURSING HOME	99.140	99.168	0.03		
--BOARDING CARE	0.000	0.000	0.00		
PROD. NSG. HRS.	68,899	68,574	-0.47		
NSG HRS PER RES DAY	2.410	2.398	-0.50	15.38	19.78
NSG HRS PER STD DAY	1.148	1.191	3.78	70.33	66.52
--LIC NSG HRS/STD DAY	0.198	0.213	7.77		
--AIDE HRS/STD DAY	0.950	0.978	2.94		
LIC NSG/AIDE RATIO	0.208	0.218	4.69	2.20	2.25

	WGHT	TOTAL 89	TOTAL 90	MEDICAID	MEDICARE	PRIVATE	OTHER
% CLASS A	1.00	32.861	34.044	13.988	0.000	20.056	0.000
% CLASS B	1.30	2.882	2.983	2.340	0.000	0.643	0.000
% CLASS C	1.64	0.000	0.000	0.000	0.000	0.000	0.000
% CLASS D	1.95	16.039	20.178	12.390	0.000	7.788	0.000
% CLASS E	2.27	6.339	4.658	2.560	0.000	2.098	0.000
% CLASS F	2.29	0.000	0.150	0.150	0.000	0.000	0.000
% CLASS G	2.56	17.074	18.566	6.872	0.000	11.694	0.000
% CLASS H	3.07	5.286	4.469	1.161	0.000	3.308	0.000
% CLASS I	3.25	5.174	3.322	0.619	0.000	2.703	0.000
% CLASS J	3.53	13.891	11.628	4.480	0.000	7.148	0.000
% CLASS K	4.12	0.455	0.000	0.000	0.000	0.000	0.000
TOTAL	.	100.000	100.000	44.560	0.000	55.440	0.000

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L T C F A C I L I T Y P R O F I L E
DHS - LTC MGMT DIVISION

002697X VIEW GOOD SAMARITAN CENTER
MN
REPORT YEAR: 90

OWNERSHIP: NON-PROFIT
COUNTY :
GEO. GRP.: 2

BEFORE F.B. ALLOCATION; RECLASSIFICATIONS; AND LIMITS

COST CATEGORY	9/30/89 PER DIEM	9/30/90 PER DIEM	% OF TOTAL	% CHANGE	GRP %TILE	MN %TILE
NURSING	7.991	9.098	25.63	13.85	6.04	6.74
OTHER CARE-RELATED	1.760	1.904	5.36	8.16	23.63	20.45
DIETARY	7.147	7.634	21.51	6.82	41.76	36.18
LAUNDRY AND LINEN	1.363	1.296	3.65	-4.88	35.71	33.26
HOUSEKEEPING	1.657	1.726	4.86	4.13	20.88	15.28
MAINTENANCE	3.296	3.399	9.58	3.13	31.32	33.71
GENERAL AND ADMINISTRATIVE	3.550	4.125	11.62	16.21	17.58	12.13
FRINGE AND PAYROLL TAXES	4.398	6.315	17.79	43.59	39.01	35.73
TOTAL PER DIEM	31.162	35.498	100.00	13.91		
FOOD PER DIEM (AFTER ALLOCATIONS)	3.514	3.644				
G&A LIMITATION (TOTAL DOLLARS)	0.000	0.000				

	7/01/90 PER DIEM	7/01/90 LIMIT	% OF LIMIT	7/01/91 PER DIEM	7/01/91 LIMIT	% OF LIMIT	% CHANGE	GRP %TILE	MN %TILE
NURSING	9.25	14.65	63.13	11.51	16.18	71.17	24.43	15.38	15.06
OTHER CARE-RELATED	5.27	7.26	72.61	5.55	7.86	70.60	5.18	19.78	15.51
CARE-RELATED	14.53	21.92	66.28	17.06	24.03	70.99	17.44	12.64	11.91
OTHER OPERATING	15.25	18.68	81.65	15.99	19.83	80.62	4.87	8.24	7.64
OPER. COST TO RATE % CHANGE (A)	18.85			22.21					

	7/01/90	7/01/91	% CHANGE	MN %TILE
HIST. PROPERTY PER DIEM	1.19	1.24	4.39	10.56
GROSS APPRAISED VALUE/BED	24284.33	23843.61	-1.81	41.80
ALLOWABLE APPRAISED VALUE/BED	24284.33	23843.61	-1.81	42.02
RATIO ALLW./GROSS VALUE/BED	1.00	1.00	0.00	31.69
ALLOWABLE DEBT/BED	0.00	0.00	0.00	
ALLOWABLE INTEREST/BED	0.00	0.00	0.00	
CAPITAL ALLOWANCE	3.96	3.31	-16.60	20.22
EQUIPMENT ALLOWANCE	0.97	1.01	3.80	
RENTAL PER DIEM	4.94	4.32	-12.58	17.98

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	7/01/90	7/01/91	% CHANGE
OPER. COST PAYMENT RATE	32.703	36.853	12.69
EFFICIENCY INCENTIVE	2.000	2.100	5.00
R. E. & SPEC. ASSESS. RATE	0.262	0.239	-8.58
PROPERTY PAYMENT RATE	3.411	3.411	0.00
MISC. RATE ADJUSTMENTS	0.686	1.440	109.98
TOTAL PAYMENT RATE (A)	39.062	44.043	12.75
WT. AVG. OPER. RATE	45.874	51.954	
WT. INFL. OPER. PER DIEM	43.874	49.854	
WT. AVG. TOTAL RATE	50.232	57.045	

	CLASS A	CLASS B	CLASS C	CLASS D	CLASS E	CLASS F	CLASS G	CLASS H	CLASS I	CLASS J	CLASS K
TOTAL PAYMENT RATES	44.04	47.89	52.26	56.24	60.35	60.60	64.07	70.62	72.93	76.52	84.09

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August 25, 1994
Date

[redacted]
Mary Bliesmer

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