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The Impact of a Nursing Case Management Model on Quality of Care as Defined by Length of Stay, Health Outcomes, and Patient Satisfaction

Gladeen A. Ayer

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by
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Dissertation Submitted in Partial Fulfillment of
the Requirement for the Degree of
Doctor of Philosophy

WALDEN UNIVERSITY
February, 1994

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DISSERTATION APPROVAL

THE IMPACT OF A NURSING CASE MANAGEMENT MODEL ON QUALITY OF CARE AS DEFINED BY LENGTH OF STAY, HEALTH OUTCOMES, AND PATIENT SATISFACTION

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ABSTRACT

THE IMPACT OF A NURSING CASE MANAGEMENT MODEL ON QUALITY OF CARE AS DEFINED BY LENGTH OF STAY, HEALTH OUTCOMES, AND PATIENT SATISFACTION

Gladeen A. Roberts

The purpose of this research was to investigate the impact of a nursing case management model versus a traditional modified primary care model on quality of care. Quality of care in this study was defined (by the provider) as length of stay, (by the client) as patient satisfaction and (by the professional) as meeting outcomes of appropriate clinical standards of care.

The study used a quasi-experimental design on the experimental (case managed) and control (modified primary care) groups. A non-random sample was selected for the patient population due to existing hospital protocol. The sample consisted of 100 patients (641 total patient days) who had elective orthopedic surgery and were hospitalized in an acute care setting.

The objectives of this study were met by collection of demographic data, length of stay data, and related complications information. This information plus outcome measurement data was collected on an Outcomes Measurement form. Patient satisfaction data was obtained by telephone survey using the structured format of the Press Ganey Patient Satisfaction Survey.

Data was analyzed with descriptive and inferential statistics. Frequencies were run on the data, as well as a "two-tailed" t-test for independent samples at the .05 level of significance.

In the case managed group, a significant reduction in the mean length of stay over the Diagnosis Related Group (DRG) length of stay was realized ($p < .05$). There was not a significant difference in the control group of patients receiving modified primary care. There was not a statistically significant difference between the groups in the patients' perception of satisfaction. There were significant differences in health outcome being met in the case managed group.

This study found that case managed patients undergoing an elective orthopedic surgical procedure in an acute care setting had a higher level of outcomes met with a reduced length of stay than non-case managed patients. Several implications for nursing, health care services and the health care reform are suggested from this study.

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Table of Contents

	Page
Chapter I - Introduction	1
Background	2
Problem	8
Purpose	10
Significance of the Study	12
Scope and Limitations	15
Research Questions	18
Definition of Terms	19
Nature of the Study	24
Chapter II - Review of the Literature	26
Concept of Case Management	27
Theoretical Base of Case Management	30
Case Management Models	35
Social Case Management	36
Primary Care Case Management	37
Medical Case Management	38
Hospital Based Case Management - The Nursing Case Management Model	40
Critical Path	43
Evaluation of Case Management Length of Stay Variables	46
Evaluation of Case Management Patient Satisfaction	49
Evaluation of Case Management Health Outcomes	53
Chapter III - Methodology	55
Introduction	55
Study Population and Sample	56
Survey Instruments	58
Procedure	61
Long Term Consequences	65
Chapter IV - Results	67
Analysis of Problems	68
Chapter V - Summary and Discussion of Findings	84
Limitations	88
Implications and Recommendations	90
Conclusions	93
Bibliography	96
Appendices:	
A	108
B	110
C	112
D	113

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Demographic Variables	69
2. Comparison of Length of Stay Between Case Managed and Non-Case Managed Patients	70
3. Overall Hospital Rating of Patient Satisfaction Between Experiment and Control Groups	72
4. Press Ganey Patient Satisfaction Summary Report	73
5. Overall Nursing Rating of Patient Satisfaction	74
6. Press Ganey Patient Satisfaction Summary Report	75
7. Comparison of Scores Between Experimental and Control Group on Specific Questions which can be Impacted by Case Management	76
8. Frequencies of Health Outcome Data in the Experimental and Control Group	80
9. Significance of Health Outcomes between Experimental and Control Group	81

Chapter 1

Introduction

The spending of American dollars on health has exceeded the comparable rate of growth in the non-health component of the Gross National Product (GNP) since the mid-1970s by three-fold percentage points. If that rate continues, throughout the 1990s, close to 15% of the GNP will be devoted to health care by the year 2000 (Couch, 1991). There are also concerns about the rising costs and the "quality of the output produced at these costs." Does increased cost mean increased quality? Can healthcare costs be controlled and quality improved?

It is necessary to look at redesign of our systems, to achieve these goals. Case Management is one example of a nursing care delivery system redesign proposed to meet quality and cost mandates (Couch, 1991, O'Malley, 1989).

The Case Management model must be explored further in an attempt to handle quality and cost issues of an industry in crisis.

Background

The health care crisis has led to the restructuring of a system influenced by market forces, third party payers, consumers and providers. All of these forces have attempted to increase their power to influence medical practice and health service delivery. The consumers are asking for higher quality, the third party payers and market forces are demanding lower costs, and the providers are asking government regulators for freedom to meet the

demands of all. In order for the provision of health care to improve, there must be some information by which consumers, providers, and third party payers can appraise its value. The inability to measure and understand the effect of patient, payer, and provider choices on a patient's well being, has resulted in widespread dissatisfaction in health services (Couch, 1991, Rosenstein, 1986).

The lack of measurement of health care's value is a major problem. Another is the escalating costs that are associated with a healthcare delivery system of questionable quality. Efforts to control health care costs have led to government legislated restructured reimbursement mechanisms such as Diagnosis Related Groups (DRGs), and Resource Based Relative Value Scales (RBRVS). The results seen in the hospital include decreased patient admissions, shorter lengths of patient stays, higher patient turnover, increased patient acuity and higher patient work loads (Couch, 1991, Curran, Minnit, Moss, 1987, Halloran and Halloran, 1985). These higher patient acuities indicate multiple physician and interdisciplinary consults for each patient. Thus, the patient may be seen by an internist, surgeon, cardiologist, urologist, pulmonary specialist, and have consultations from nutritional support, discharge planning, respiratory therapy, and a clinical nurse specialist. The problem that results is lack of coordination of care and lack of collaborative practice. The surgeon may order an electrocardiogram prior to surgery which the cardiologist may have done in his office six weeks prior to the hospitalization.

The decreased length of patient's stay has accelerated the number of tests that are done within a short time period. This

results in patients and their medical record being off the unit for prolonged periods. One consequence is that consulting and attending physicians do not have access to information, which may result in a delay in treatment.

The patient is the recipient of this variable approach to health care, and the patient is not satisfied. In a recent ten country survey of the general public's attitude toward national health systems, only ten percent of the American respondents agreed with the statement: "Our health system works pretty well and needs only minor adjustments" (Blendon, Lettiman, Morrison, Donelan, 1990). Yet it is the providers' responsibility to provide the highest quality care to the consumer. This is a current challenge as quality of care is a major issue in 1993. Quality care is cost effective care (Couch, 1991). The literature reveals specific criteria identified with systems that will be able to support organizational quality goals and objectives. These criteria include:

1. Early patient discharge or discharge within an appropriate length of stay.
2. Standardized clinical outcomes.
3. Promotion of coordinated care and continuity of care.
4. Use of appropriate and reduced resources.
5. Achieving greater levels of satisfaction on the part of the patient and physician by broadening the level of quality to include both perspectives.

6. Supporting a strategy of growth in a changing environment that is increasingly influenced by third party payers and managed care organizations. (Couch, 1991, Zander, 1988, McKenzie, Torkelson, Holt, 1989, Mayer, Madden, Lawrenz, 1990, King, 1992).

One tool that the provider has is the care delivery system which can integrate clinical and financial factors and outcomes. To add value to the systems that support the work of a hospital, quality and utilization must be more closely aligned with the clinical processes (Couch, 1991). An effective patient care delivery system would incorporate financial information into the patients plan of care with the goal of utilizing cost effective treatment protocols that would be understood and utilized by clinicians and the patient and his/her family. This would result in efficient patient care with less delay, effective outcomes and patient satisfaction with this care (Couch, 1991, McKenzie, Torkelson, Holt, 1989). Case management is one care delivery system that proposes achievement of the previous stated objectives. It focuses on providing outcome oriented patient care within an appropriate length of stay, utilizing appropriate or reduced resources, coordinating multidisciplinary services, and communicating with the patient and family regarding plan of care developed and outcomes expected to be achieved (Henderson, and Collard, 1988, Stetler, 1987, Zander, 1987, Zander, 1988).

Protocols are developed to provide care in settings including critical care units, medical surgical units and obstetrical settings. The protocols often termed case management plans or care maps, outline the length of stay in relation to the DRG. Thus the

interventions, goals, and expected clinical outcomes of a particular case type are established for the patient, nurse, and physician at any point during the anticipated length of stay.

Case management plans are developed by experts in the related field. The interdisciplinary team including physicians, nurses, respiratory therapists, clinical nurse specialists, dietitians, physical therapists, occupational therapists, discharge planners, and social workers, may be involved in establishing the case management plan.

Critical pathways are abbreviated versions of the case management plan that identify the medical and nursing interventions that must occur within a specific time period. The critical pathway identifies all aspects of care that must be delivered such as tests, consultations, treatments, patient activity goals, diet, teaching, and plans for discharge. The time line becomes the reinforcer. It provides the framework for monitoring the process elements (Couch 1991).

Case management plans and critical pathways are two tools that can be used in a case management delivery model. They give a definition to quality that is incremental and measurable (Couch, 1991). They define the steps that the nurses and physicians should take with a patient with a particular case type. The outcomes assist in measurement of quality of care. They help ensure that standards of patient care are met while looking at financial factors. Critical paths set out an outline of care processes that can be evaluated daily for variances in progress. Looking at variances in critical paths for a group of patients within a

particular DRG can provide a review of the processes of care for types of diseases, so that hospitals can improve practice resulting in increased quality without increased costs (Henderson and Collard, 1988), (Couch, 1991).

Health care organizations today are looking for means of survival. The hospitals utilizing the best managed and most cost effective processes with quality outcomes will be the survivors. It is necessary to bring patients and the interdisciplinary healthcare team together in a system of care delivery that can optimize the contributions of both in an environment of DRGs, contract medicine, increasing third party regulation, and public dissatisfaction.

Problem

Nursing is in a unique position to redesign care delivery systems to meet the quality and cost containment outcomes necessary in today's health environment. Nursing case management is one example of a redesigned care delivery system using a systems approach that integrates clinical and financial factors and outcomes. Nursing case management can impact the quality of care as defined by the provider, patient, and professional.

In this study attempts are made to show that:

1. Elective surgical patients that receive care using the case management model in the acute care setting will have a shorter length of stay than those patients who receive care under the traditional modified primary care model.

2. Elective surgical patients that receive care using the case management model in the acute care setting will perceive increased satisfaction with their hospital stay versus those patients who receive care under the traditional modified primary care model.

3. Elective surgical patients that receive care using the case management model will have improved health outcomes versus those patients who receive care under the traditional modified primary care model.

Purpose

The purpose of this study is to evaluate the impact of the case management model used with surgical patients in an acute care setting upon quality of care. Quality of care in this study is operationalized as patient satisfaction, desired health outcomes, and length of stay. Donabedian (1988) states that Total Quality Management must be from the point of view of the consumer, professional and provider. Patient satisfaction is defined as quality by the consumer. Utilizing patient's reporting of satisfaction is a useful approach as satisfied patients are more likely to comply with their treatment, return for care and have improved outcomes than are dissatisfied patients (Ventura, Young, Feldman, Pastore, Pikula, Yates, 1985, Collard, Bergman, Henderson, 1990). Meeting desired health outcomes to standard interventions is defined as quality by the professional who can facilitate significant improvement in the patient's quality of life by meeting clinical standards. Reducing length of stay is viewed as a cost saving quality outcome by the provider, who is reimbursed based on DRGs.

Limited research has been done on the effect of case management on both quality and cost (Lamb, 1993). This study will add to the existing research and provide a basis for further research. The findings may also contribute to changes in practice patterns which may assist in the reduction of health care costs at the same time improvements are made in quality of care.

Significance of the Study

Changes in the provision of health care have occurred as a result of advances in technology, restructuring of payment strategies, reduced lengths of stay, the aging population, and a redirection to outpatient centered care in a variety of settings. Frustrations have resulted because the health care delivery system has not been able to incorporate the changes and meet the expected quality and cost outcomes.

Case management has emerged as a strategy to focus on the problems and needs of clients, as well as the families and friends, while maintaining a balance between outcome, cost, and process (Bower, 1992, Zander, 1988).

The monitoring of patient length of stay variables, with the case management model of care delivery will produce measurements to evaluate cost effectiveness. The literature provided reviews where length of stay variables were studied in relation to case management (Leibman-Cohen, 1990, King, 1992, Whitman, 1991, Bigelow and Young, 1991). However, cost reduction in health expenditures does not necessarily mean quality care. The providers of health care have traditionally held onto the belief that decreased costs

would mean decreased quality (Couch, 1991). Thus, this study will examine quality of care as defined by health outcomes and patient satisfaction.

Patient outcomes result from complex work processes and interventions used to deliver care. The only way to improve outcomes is to identify and change the practices and processes that create outcomes (Bolster, 1991). This study will help determine if case management has an impact on outcomes. To date empirical studies of outcomes from case management delivery models are few (Sandhu, Duquette, Kerouac, 1992).

Consumer satisfaction is viewed as an outcome of healthcare organizational effectiveness (Eck, Meehan, Zigmund, Pierro, 1988). This is vital because consumers today are sophisticated and are demanding a right to determine where and how their health care dollars are spent. In a study by Weisman and Nathanson, the authors found that the client's satisfaction level predicted the rate of their compliance with the prescribed medical regime (Weisman, Nathanson, 1985). Better patient compliance means improved health care without additional cost. In an industry besieged by cost factors and public dissatisfaction, all proposed solutions need to be evaluated.

It is the intent of this study to evaluate the impact of case management on cost and quality outcomes. The changes that may result from an alternate delivery model such as case management, may help ensure desired health outcomes for a population that is becoming increasingly less able to afford health care.

Scope and Limitations

This study will use a quasi-experimental research methodology to examine the impact of a case management delivery model on a group of surgical patients. The patients will undergo elective orthopedic surgeries and be hospitalized in an urban teaching hospital, on two separate units. The experimental group will have the case management care delivery model in use, while the control group will have the traditional modified primary care nursing model. An assumption with this study is that the patients in both groups are similar patient types because patients in the study are restricted to all non-complicated surgical orthopedic cases admitted during the period of time of the study. The literature shows clinically related variables such as the patient's primary diagnosis, number of surgical procedures and the number of secondary diagnosis are factors that had a significant impact on length of stay (Lew, 1966, Ro, 1969, McCorkle, 1970, Lave and Leinhardt, 1976, Leibman-Cohen, 1990). The patients used in both groups had similar primary diagnosis - orthopedic surgery and they all had one surgical procedure with no secondary diagnosis. To keep the groups as similar as possible, patients who did not meet the above criteria were eliminated from the sample. The literature also shows that in both groups of patients the anxiety levels, acuity levels and patient standards of care are equivalent (Larson and Gould, 1978). Patients will be assigned to a particular unit based on the admitting physician as are all patients at this institution. Although orthopedic surgical patients share many characteristics, the methodology includes threats to validity related to non-random selection. The percentage of RNs (60%), LPNs (20%), and NAs (20%), on both units is the same. However, because of

turnover factors, staff will have varying levels of experience. The outcomes of nursing case management in this study will be generalized to the acute care surgical unit in an urban teaching hospital setting. The patient care outcomes will be limited to objective measures related to length of stay, and patient satisfaction, and health care outcomes.

Patient satisfaction information will be collected by the telephone interview method using the structured format of the Press Ganey survey. The data collected may be flawed due to participant bias or indifference to the study or concern over anonymity. The Press Ganey scores obtained in this study cannot be generalized to all hospitals as scores can be affected by hospital size, whether the hospital is teaching or non-teaching, and population size of the community.

The health outcomes will be measured by review of the charts utilizing clinical standards of care of an urban teaching hospital. These standards are based on national standards published by the American Nurses Association and could be generalized for use throughout the hospitals of the United States. Limitations include perceptual errors of the reviewer and lack of documentation by the care giver.

Findings may also be affected by medical interventions as patients are assigned to units based on physician and diagnoses. The patients in the experimental unit will generally have a certain group of physicians while the patients on the control unit will have a separate group. Case management does involve interdisciplinary collaboration. The lack of physician

collaboration in working with the case manager and critical paths may influence the results.

Research Questions

1. What is the impact of a nursing case management model versus a traditional modified primary care model on the length of stay of patients hospitalized for an elective surgical procedure in an acute care setting?
2. What is the impact of a nursing case management model versus a traditional modified primary care model on patients' perception of satisfaction while hospitalized for an elective surgical procedure in an acute care setting?
3. What is the impact of a nursing case management model versus a traditional modified primary care model on quality of care as defined by health outcomes of elective surgical patients, hospitalized in an acute care setting?

Definition of Terms

Case Management:

A comprehensive clinical system to ensure the expected cost effective quality patient outcomes for the defined case type (Bower, 1992).

Case Manager:

A nurse with advanced clinical skills who is responsible for managing individual patient's through their episode of care. The Case Manager is also responsible for identifying trends across patient hospitalizations, and making changes to the health care delivery system to facilitate achievement of cost effective quality outcomes (Bower, 1992).

Case Management Plans:

Detailed documents that provide information on a specific patient diagnosis. This includes nursing diagnosis, clinical outcomes for each diagnosis, DRG, length of stay goals, and nursing and physician interventions that facilitate movement toward the goals (Bower, 1992).

Collaborative (Cooperative Practice):

An integrated system of patient care with shared responsibility and accountability by nurse from nursing knowledge base and physician from a medical knowledge base (Couch, 1991).

Cost Effectiveness:

A formal comparative analysis of the costs and accomplishments of a technology or service under community practice conditions (Couch, 1991).

Critical Path:

A day to day outline of the key events (tests, procedures, consults, and teaching) that must occur for the patient to achieve the prescribed goals within the designated length of stay (Bower, 1992).

Diagnostic-Related Group:

Set of 465 disease groupings bases on the international disease classifications. Reimbursements commonly are made on the basis of DRGs (Halloran and Halloran, 1985).

Elective Surgery:

The patient, surgeon and provider collaboratively elect the date of the surgery. Patient is a non-emergent case (Ro, 1969).

Health Status:

The measured level of health of an individual over a given period.

- o Activities of daily living (ADL) e.g., eating, dressing, bathing.
- o Major life activity (MLA) e.g., employment of retirement (Couch, 1991).

Length of Stay:

The number of days spent in the hospital from admission to discharge (Lave and Leinhardt, 1976).

Modified Primary Care Nursing Model:

Nursing model in which the registered nurse is responsible for the total care of her patients during her assigned shift. The Registered Nurse is not necessarily responsible for the same patient assignment from one day to another (Hayes and Miller, 1992).

Outcomes:

The result of any given structure and process, at any specified time. In health outcomes can be conceptualized in terms of health status, economic outcomes (cost of care), societal outcomes (measured in terms of provider or customer satisfaction) (Couch, 1991).

Patient Satisfaction With Care:

The degree of agreement between patient's expectation of nursing care, and their perceptions of care actually received (Hildman and Ferguson, 1990).

Quality of Care:

The attribute of a product, service, or outcome that is the

extent to which achievable value is actually achieved (Couch, 1991).

Systems Approach:

Utilizing multiple resources to focus on a central objective, listing sub objectives developing a measure of performance, and evaluation of meeting of objectives, with outlined steps if the objective is not reached (Churchman, 1979).

Variance:

Identification and evaluation of discrepancies between expected and actual events. Variances are classified into three categories: Patient/family, system, and practitioner (Lamb, 1993).

Nature of the Study

The study will use a quasi-experimental research methodology to investigate the impact of a nursing case management model (independent variable) versus the traditional modified primary care model (independent variable) upon quality of care as defined by length of stay (dependent variable), health outcomes (dependent variable) and patient satisfaction (dependent variable).

Patients undergoing elective orthopedic surgery at a 630 bed urban teaching hospital will be non randomly assigned to the experimental and control group. The case management model will

be used with patients in the experimental group and a modified primary nursing care model will be used with patients in the control group. Patients in both groups will be compared using the allocated DRG length of stay with their actual length of stay. Quality of care will be operationalized by the variables of health outcomes, length of stay, and patient satisfaction. The health outcomes will be retrieved from documentation of the outcomes related to pain management, mobility, infection, and discharge planning. These outcomes will be derived from valid and reliable standards of care used at this hospital, and in hospitals throughout the United States.

Patient satisfaction will be based on the results of telephone interviews using the structured format of the Press Ganey Patient Satisfaction Survey. These telephone surveys will be done after discharge from the hospital to prevent bias in the answers. The interviewer will identify herself as a patient representative with the intent of gaining information regarding the patient's satisfaction with their hospitalized care by all disciplines. The telephone interviews will insure a high response rate to the satisfaction survey.

The findings from this study will provide information that can possibly be generalized to surgical patients in other healthcare settings in relation to improved quality of care at a decreased cost. The results of this research will also contribute to the current knowledge of the relationship of case management on clinical and cost outcomes. This study may also provide a basis for future research on the impact of case management on other hospitalized patients and case types such as medical, geriatric, psychiatric, and long term.

Chapter II

Review of the Literature

This chapter will consist of an overview of case management separated into four sections. First, the concept of case management; second, the case management model as a systems model; third, the various models of case management; and fourth, case management in relation to the outcome variables of cost, health, and patient satisfaction.

Concept of Case Management

Case management is a paradoxically simple yet complex concept (Bower, 1992, Lamb, 1993). The complexity is found in its various definitions and various settings. Currently, case managers may be found in every sector of health care, including acute care, long term care, and community settings (Bower, 1992, Lamb, 1993, Grau, 1984, Henderson and Collard, 1988). The primary purpose for utilizing a case management program may differ among programs, but coordination of care is the basic component of all models of case management (Bower, 1992, Newman, Lamb, Michaels, 1991, King, 1992, Zander, 1990, Liebman-Cohen, 1990). Case management exists within many settings including insurance programs, public health practices, mental health settings, acute care hospitals, social service settings, and worker's compensation programs.

The literature referred to case management simultaneously as a system, a role, a technology, a process, and a service (Bower, 1992, Zander, 1990, Newman, 1986, Lamb, 1993). As a system, case management focuses on the achievement of patient outcomes within

appropriate time framesutilizing effective and resources (Liebman-Cohen, 1990). The elements in this system include: patient assessment and identification of problems; planning interventions to meet optimal outcomes of patient problems; coordination and/or delivery of services; and evaluation.

As a role, case management provides a patient or group of patients with a health care practitioner who can coordinate services across a continuum of settings and with various members of the interdisciplinary team. Case management involves the formation of new tools and techniques to organize care. Thus it can be considered a technology (Bower, 1992). As a process, case management expands on the nursing process of assessment, planning, intervention, monitoring, and evaluation. The case manager utilizes this process to follow patients from their homes through successive hospitalizations over the course of years.

Case management may be considered a service because it provides gate keeping, and facilitation of services for the patient. Because of the many problems experienced by the increasing number of elderly, facilitation of service is necessary. The problem is compounded in an industry where care is fragmented between agencies. For example, the oncology patient may need assistance finding medications (Medicare will not pay for the prescriptions, but the cancer society will). Another problem may be in finding living quarters. The patient cannot stay in the hospital or go home, so a case manager determines what alternate arrangements there are. Equipment needs may present another problem as the patient may need a hospital bed with a special care mattress. Assessments of patients must be followed with linkage of

resources, and monitoring to ensure effective service delivery. The literature revealed multiple programs where local councils on aging became concerned with providing adequate care management for its members with multiple health problems. These councils established case management programs with local hospitals, social service agencies, and colleges to provide support services necessary to allow clients to remain in their homes (Clarke, Anderson, 1988, Parker, Secord, 1988, Kaplan, 1988, Whitman, 1991). Many managed care systems such as HMOs and PPOs, are using this service aspect of case management to deal with complex and catastrophic cases such as head injuries, chronically ill elderly, aids clients, mentally and functionally impaired clients, and neonates. The managed care companies have utilized this measure as a cost containment effort. Bower (1992), Newman (1986), and Lamb (1993) support the concept that case management is still evolving. Various professions can occupy the role including nurse, social worker, physician's assistant, and mental health technicians. Lamb (1993) indicates that because case management has so many various definitions and component activities, it is difficult to avoid confusion about the role within and outside of nursing. Because the practice of case management has expanded rapidly in response to external pressures to increase quality and reduce costs of healthcare, there has been an absence of a clear definition and theoretical base for case management (Lamb, 1993, Newman, 1986).

Theoretical Base of Case Management

Although the literature reveals a lack of a clear definition and as a result the lack of a theoretical base for case management, Lamb reiterates the need for its development. Newman, Lamb, and

Michaels (1991), apply Newman's theory of nursing practice to the practice of case management. They parallel the characteristics of nursing in case management to the nurse client relationship in Newman's theory, as expanding consciousness (Newman, 1986). Other publications look at theories from disciplines such as sociology, business, and management and state a variety of studies need to be done utilizing various theories to develop a scientific credible body of knowledge on case management (Fisher and Weisman, 1988, Schmeling, Futch, Moore, and MacDonald, 1991), describe a systems model which is needed in organizing and managing work redesign in acute care settings of which case management is a part. Case management was described as a systems model in Carondelet St. Mary's Hospital and Health Center in Tucson, Arizona. At this center the patient was looked at as a whole and the focus on the work of the patient required a multi disciplinary approach instead of solving problems by individual departments and agencies (Lamb, 1993). Mayer, Madden and Lawrenz, (1990), in their book of **Patient Care Delivery Models**, describe a multidisciplinary approach that integrates systems to work together to solve patient care problems incorporating quality and cost at all levels in the health care industry. This approach using systems theory is case management.

The framework of the systems approach focuses on:

1. The understanding of the disease across physiologic and psychosocial dimensions.
2. Mutual goal setting and care planning.
3. Interdisciplinary or trans-disciplinary functions.

4. Evaluation of outcomes in terms of product, process, expense, and satisfaction (Whitman, 1991).

The systems approach to healthcare looks at the central objective which is coordinating care to achieve optional outcomes in a cost efficient manner. Churchman, in **The Systems Approach**, states that the next step would be to list the subobjectives which are required in order to accomplish the central objective (Churchman, 1979). In case management, this involves the formation of care maps or critical paths to outline the medical, nursing, and interdisciplinary measures necessary to achieve the central objective. The next step is developing a measure of performance for each of the subsystems. In the critical path this is denoted by indicating specific treatments or care that must be delivered on designated days. This is termed the standard of care in case management, which can be compared to the standard for the subsystem by Churchman. Next, in systems theory, steps are outlined if the plan fails. In case management, a variance analysis is the process by which action is taken when the plan fails. Thus, case management utilizes the approach described by Churchman as a plan for development of a system, with activities that meet the overall objectives, with measures of performance or standards (Churchman, 1979). The model of case management used in this study will utilize the systems approach as its theoretical base.

The model of case management can be affected as is any open system, by its internal and external constraints. Critical paths are typically created around DRG assigned lengths of stay. As Medicare changes the DRG assignment and case type from nine to seven days, so will the critical path be changed. If the physical

therapy department does not do the treatment ordered by the physician, as designated on the critical path, the patient may stay extra days in the hospital. The openness of the system is reflected in case management where everything is related to everything else and no element has an independent effect, (Schmeling, Futach, Moore, MacDonald, 1991).

Case management is more than a series of events or tasks. It demands continual involvement with the client and provider to ensure the clients progress on the service path and movement toward the established goals, (Ethridge, 1989). This is characteristic of the open system which needs feedback to prevent entropy. As on open system case management facilitates interchange with external factors (family and home conditions) and internal factors (pain management) and adapts the plan of care to meet the stimuli from these sources. Thus optimum efforts in case management are more than the sum of the interventions used to remedy specific deficits. Each member of the interdisciplinary team has a set of expectations about the value of each intervention. Therefore, optimum effect from the intervention comes from a common understanding of the significance of the intervention and collaboration. The case manager who is able to get the x-ray results on the chart a day sooner facilitates earlier initiation of physical therapy which improves the patients chance of preventing complications from bed rest, and results in a one day earlier discharge.

Case management looks at the patient as a whole entity. This is another component of an open system. The patient is not looked at as a "total hip replacement," but rather as a person with a multitude of needs including medical, physical, psycho social, and rehabilitative.

Another property of open systems as defined by von Bertalanffy is equifinality. Case management can still produce its outputs, improved patient outcomes, and increased patient and staff satisfaction, while maintaining costs, with varying inputs and through puts. Case management may be a necessary means to improve health status in the health industry where services are fragmented, inadequately funded, poorly coordinated and thus, marginally effective (Tonges, 1993).

Case Management Models

Community service coordination, a forerunner of case management, began at the turn of the century in public health programs (Bower, 1992). Case management was used after World War II to provide services for discharged psychiatric patients (Grau, 1984). In the 1970s, the U.S. Government moved to establish comprehensive coordinated care at the community level utilizing cost containment strategies. Such programs established at city, county and state levels included New York Long Term Home Health Care, Georgia Alternative Health Services, San Francisco's On Look Community Care for Dependent Adults, and the Miami Channeling Program (Humphreys, Guthrie, Mason, Liem, Stern, 1988, Stanhope and Lancaster, 1984).

In the private sector, insurers became concerned about the rising health care costs and purchasers demanded more careful coordination of catastrophic case types. Thus in the 1980s, commercial insurance companies, HMOs, PPOs and Workers' Compensation programs identified the need for case management (Bower, 1992). With the advent of DRGs, acute care hospitals

recognized the need for case management and adopted its goals within the hospital setting.

As a result, today there is no single model for case management, as it is understood and defined differently by the numerous groups who have an interest in it (Fisher and Weisman, 1988). Three categories of case management were defined by Merrill (1985) as social, primary care, and medical social.

Social Case Management

This model emphasizes the use of a community based support system in an effort to delay hospitalization or nursing home placement. Health, functional and social needs are addressed in this setting, where a multidisciplinary approach is used to coordinate care (Liebman-Cohen, 1990, Quinn and Burton, 1988). The client's access to services is improved by linking him with funding sources and the necessary medical, social, nursing, and supportive services. Examples of this model include the South Carolina Long Term Care Project, and the New York Project Access. Both were federal and state initiatives (Quinn and Burton, 1988).

Primary Care Case Management

In this model, based on the medical model of care, the physician acts as a case manager and advocate in all health related matters. The physician case manager contracts with a patient or through a patient's insurer for a specified time period, to provide all or designated components of health care, either through direct

service whenever possible, or through appropriate referral to qualified and approved consultant specialists, hospitals, ancillary, and out patient facilities (Like, 1988). The growth of the managed care systems such as Health Maintenance Organizations (HMOs), Preferred Provider Organizations (PPOs), Independent Practice Associations (IPAs), Primary Care Networks (PCNs), are a response to the public's demand for more personalized, coordinated, effective, and efficient health care.

Physicians functioning as primary care managers have gate keeping for the health insurance plans as one of their responsibilities. Studies done examining physician's attitudes toward the gate keeping function revealed physicians have mixed feelings (Ellsburg, Montano, Manders, 1987). Some feared that their gate keeping functions created an adversarial relationship between the physician and patient. They were also concerned about the quality of care when they were influenced by personal financial considerations in making clinical decisions. Another major liability with this approach is the exclusion of necessary medical services and hospitalization (Liebman-Cohen, 1990). Like (1988), in his article on **Primary Care Case Management**, summed it up well by stating "one can only hope that case management will continue to facilitate the clinical process, and that the physician's role will not simply become to be the patient's advocate sometimes, to be the gatekeeper often, to ration health care always."

Medical Case Management

Medical case management differs from general case management in that it focuses on patients with severe illnesses or injuries that require a great deal of intensive care. The basic difference between medical case management and other cost containment mechanisms is its focus on integrating and mobilizing resources to meet individual patient needs. Medical case management does not ration but rationalizes a care plan by providing the necessary resources to meet the patient's needs (Henderson and Collard, 1988).

Most medical case management programs screen patients by a set of defined criteria. The case management plan covers three aspects of patient care management: how to obtain patient care that is of lower cost but comparable or superior quality; how best to coordinate the patient's care among family members and (other) providers; and how the patient's existing insurance plan can cover needed services (Henderson and Collard, 1988).

The rationale behind using the medical case management model with catastrophic illness is based on a study of the medical care patterns of major businesses in the United States (Leibman-Cohen, 1990). This investigation showed a large portion of health care costs are attributable to only five to ten percent of health insured individuals (Rosenbloom and Gertman, 1984). Catastrophic

illness were shown to be high cost illnesses. Thus, cost containment efforts are appropriately directed at these case types.

Additional definitions of case management are offered by White (1986), who based the case management approach on five different functions. These models were differentiated on the basis of authority level of the client, informal support systems, finances, and funding sources (White, 1986, Leibman-Cohen, 1990).

1. Restricted Market - In this arrangement, the clients become their own case managers and negotiate for services among autonomous providers.
2. Multi Service Agency - This system allows an agency to provide health care services with limited coordination.
3. Advocacy Agency - With this model, some case management is provided along with direct patient care services.
4. Brokerage Agency - The agency in this system acts as a broker in controlling and monitoring records.
5. Prepaid Long-Term Care Organization - With this arrangement, a company contracts for case management services and coordinates resources on a prepaid, capitated basis.

Hospital Based Case Management - The Nursing Case Management Model

Health care economics have influenced the movement of case management in acute care settings to the forefront. Henderson and Collard (1988), Bower (1992), and Liebman-Cohen (1990), have reported several advantages of hospital based case management. The hospital offers a wide range of services available to both the provider and recipient of case management services. Secondly, the case manager's early contact with the patient promotes early assessment of patient needs, coordination of care, individualization of the established protocols, and a plan of care mutually set by physician, nurse, and patient. Third, since space and overhead costs are factored into hospital based care, the management of the expenditures associated with high case patients is minimized. It is also possible to measure the cost-effectiveness of case management using existing hospital systems.

Many hospitals are utilizing registered nurses as case managers to act as advocates for their clients, coordinate care, and improve the fiscal and quality outcomes of their healthcare delivery (Cronin and Makleburst, 1989, Bower, 1992, Henderson and Collard, 1988, Leibman-Cohen, 1990, Zander, 1990). Nurses are suited to provide case management because nurses bring broad based skills and knowledge to case management. The nurse has been the coordinator of the patients care and physician's orders for decades. The coordination of services and care is the primary

function of case managers. This role is a natural extension of the nursing role (Bower, 1992, Falk, 1993). Nurses on a daily basis help patients to adapt to the potential or actual effects of health states. This is also a critical role of the case manager. Nurses are exposed to the physical and psychosocial issues faced by patients and their families, so that they are able to incorporate a holistic perspective into the assessment, planning, implementation, and evaluation of care. Case management demands this focus from its managers. The skills and knowledge that nurses bring to the case management role are unique when compared to other disciplines, such as social service or physical therapy. Bower (1992), Falk (1993), Mundinger (1984) supports nurses in the case management roles by noting that, "nurses can provide the majority of services that social workers offer to these clients, but the converse is not true; social workers have few, if any, of the physical assessment or illness detection skills of the nurse."

Nursing case management as a model tends to be clinically oriented with quality and cost outcomes as major functions. It is based on the belief that client care must be coordinated across the care settings within the hospital and into the community. A nursing case manager is responsible for ensuring that case management criteria are achieved within a specified time period and that variations based on a patient's individual needs are justified and well documented. Outcome oriented goals cover all aspects of care (McKenzie, Torkelson, Holt, 1989, Bower 1992, Mayer, Madden,

Lawrenz, 1990). In nursing case management, nurses and attending physicians are accountable for specific clinical and financial outcomes. The case management committee selects DRGs that will benefit most, from nursing case management. Major diagnostic categories are analyzed for profitability and case volume. The major diagnostic categories that are high volume with low profit margins may be selected. Historical case data is also screened. Koerner (1993), recommends looking at the recidivism rate of groups of patients, and then concentrating on patients with frequent repeat admissions. The case manager can coordinate with patient, family, and community resources to prevent re admissions and to decrease the severity of the illness upon re admission. For example, the patient with chronic obstructive lung disease will most likely face future hospital admissions but by having the proper medical treatment at home, the patient may not be as severe on re-admission, thus saving thousands of dollars from the cost of a pulmonary intensive care bed.

The case management model uses a general systems framework but must be individually designed and detailed to meet the needs of the client and provider (Bower, 1993, Falk, 1993, Koerner, 1993, Tonges, 1993).

The case management model used in this study was one in which a master's prepared nurse functioned in the role of case manager. This model focuses on the management and coordination of patient

care needs. The case manager collaborates with the staff nurse in meeting the physical, psychological, social, and discharge planning needs. The staff nurse or primary nurse is responsible for the actual patient care delivery (O'Malley, 1988, Leibman-Cohen, 1990, Bower, 1993). She works with licensed practical nurses and nurse's aides to provide direct care on a particular unit. The master's prepared nurse designated as the case manager is responsible for coordinating patient care of an assigned case load in collaboration with physician and staff, patient, family, interdisciplinary health team members and community resources (Leibman-Cohen, 1990, Falk, 1993).

Critical Path

One important tool used by the case manager is the critical pathway. This is a standardized plan of care for patients in a specific diagnostic case type (Ethridge, 1989). The critical pathway identifies all aspects of care that must be delivered such as consultations, tests, treatments, diet, activity goals and plans for discharge within a designated length of stay. The time line becomes the reinforcer. It provides the framework for monitoring the process elements (Couch, 1991).

The critical path is developed using scientific evidence to evaluate the effectiveness of care. It is coordinated with the expert opinions of members of the interdisciplinary team (McKenzie et al, 1989, Tonges, 1993, Bower, 1992, Koerner, 1993).

The critical path is a project network technique designed to help managers plan, schedule, and control special projects. The critical path method was designed from the Program Evaluation and Review Technique (PERT), (Falconer, Roth, Sutin, Strasser, Chang, 1993). PERT was first used to develop submarines in 1958, by the United States Naval Special Projects Office (Woolf, Cass, McElroy, 1968). The application of ideas from the management sciences to the clinical area is more recent. One of the first published studies using this approach came from the New England Medical Center Hospitals and the Center for Case Management in South Natick, Massachusetts (Zander, 1988).

The case manager utilizes the critical path and daily analyzes the variances in an attempt to prevent delays in test, treatments and to identify possible blocks to the desired outcome. Three major categories of aggregate variances have been identified: Patient and/or family; provider; and system (Bower, 1993, Tonges, 1993). Variances due to factors related to patient and/or family include age, lack of social support, patient's fragile condition, complications, etc. Variances due to the clinician may be due to a care giver omission or a different physician order. The system variances arise because of the system in which patient care is given. Internal variances would include a delay of chemotherapy initiation because of the pharmacy delivery system. External variances may be due to inability to place a patient in a nursing home because of lack of available beds.

According to the patient's needs the nursing case manager meets with physicians during rounds, and with various members of the health care team. When there are different consultants on a case, the case manager watches for conflicting or redundant orders (McKenzie et al, 1989). The case manager also coordinates the patient's discharge needs (Falk, 1993, Bower, 1992, Tonges, 1993, Koerner, 1993, McKenzie et al, 1989). The case manager interviews the patient shortly after admission to do an in-depth psycho social assessment to determine what the patient will need when it is time for discharge. Thus resources are coordinated far ahead of the discharge day.

Evaluation of Case Management

Length of Stay Variables

The case management models have focused on providing measurements in terms of cost and quality. The nurse case manager can coordinate care, thus impacting length of stay favorably. With the implementation of the DRG's, length of stay has become an overall indicator of a hospital's financial performance (Leibman-Cohen, 1990, Zander, 1988, Bower, 1992, Tonges, 1993, Koerner, 1993).

The literature reveals several variables that must be considered in relation to length of stay. This section will review and analyze studies related to patient length of stay variables. Age, gender, and other demographic variables were found to be

unreliable predictors by Posner and Lin (1975), and Lave and Leinhardt, (1976).

Lew (1966), demonstrated the effect of patient admission during different days of the week on average length of stay. However, these variables did not account for a large portion of the variation in average length of stays (Lave and Leinhardt, 1976, Mughrabi, 1976).

Clinical related variables such as the patient's primary diagnosis, number of surgical procedures, and the number of secondary diagnosis were factors that had a significant impact on patient length of stay (Lew, 1966, Ro, 1969, McCorkle, 1970, Lave and Leinhardt, 1976, Leibman-Cohen, 1990). Primary diagnosis alone accounted for 27 percent of the variability in patient length of stay (Lave and Leinhardt, 1976). Patients with urgent or emergent status had longer hospital stays because of the poor health of these patients on admission and the unscheduled nature of these admissions which resulted in delays and inefficient mobilization of hospital services (Leibman-Cohen, 1990).

In earlier studies, Riedel and Fitzpatrick (1964) and Mughrabi (1976), stated that the primary diagnosis is the most important factor contributing to the length of a patient's hospitalization. Additional studies indicated that comorbidity and "related complication resulted in a longer length of stay" (Berki, Ashcroft, Newbrander, 1984, Grau and Kovner, 1986).

Early discharge planning is another clinically related variable that can decrease hospital length of stay. In a study done by Marchette (1986), a decrease of 0.8 days of hospitalization was found for those patients that received discharge planning early in their hospital stay. In this same study, the patients diagnosed with cerebral vascular accidents had a two day decrease in length of stay with early discharge planning.

There were some factors which delayed the patient's discharge and increased length of stay. These factors included: lack of alternate care resources, noncompliance of medical staff to complete transfer and referral forms, and factors associated with changes in patient's insurance coverage (Altman, 1965, Zimmer, 1974, Schuman, Ostfeld, Willard, 1976, Schragar, Halman, Meyers, Nichols, Rosenblum, 1978, Boone Coulton, Keller, 1981).

The literature revealed studies that recognized case management for its significant impact on decreasing patient length of stay (Zander, 1988, Bigelow, Young, 1991, Sandhu, Duquette, Kerouac, 1992, Leibman-Cohen, 1990, Cronin, Maklebust, 1989, Ethridge, 1989. Cohen (1991) presented empirical data on her study of length of stay of cesarean section patients who received case management. She found the experimental group experienced a drop in length of stay by 19 percent. Ethridge (1989), Cronin and Makelbust (1989) and Lamb (1993) also presented studies that showed a reduction in length of stay occurred with the use of nursing case management,

although no empirical data exists. Brett, Tonges and Bradley (1990) report empirical data that indicates a decrease in length of stay of 10 percent for a select group of patients after case management was initiated. In a study conducted at Sioux Valley Hospital, the length of stay for coronary bypass patients was 8.95 days before case management, and 6.93 days after case management was initiated (Koerner, 1993). The literature revealed the need of additional empirical studies to be done on more DRG categories, and after the case management model had been in place for a longer time period than a year.

Evaluation of Case Management

Patient Satisfaction

Patient satisfaction with hospital care is of concern to payers, providers, and recipients, and is of considerable concern to all when monitoring care quality in relation to specific interventions such as case management (LaMonica, Oberst, Madden, Wolf, 1986). Literature reveals efforts devoted to demonstrating the cost effectiveness of case management, however quality must be measured as well.

One approach to define quality care is from the perspective of client/patient satisfaction with that care (Collard, Bergman, Henderson, 1990, LaMonica, Oberst, Madden, Wolf, 1986, Ellwood, 1988, Eck, Meehan, Zigmund, Pierro, 1988, Couch, 1991). Utilizing

patient's self reporting of satisfaction is a useful quality assessment approach for two reasons. First, many practitioners consider patient satisfaction to be an integral part of quality care, since patients who are more satisfied with their care may be more likely to comply with treatment regimens, return for care and have improved outcomes than a dissatisfied patient (Ventura, Young, Feldman, Pastore, Pikula, Yates, 1985, Collard, Bergman, Henderson, 1990). Second, patient satisfaction has been linked with better patient provider communication. Since diagnosis and treatment depend heavily upon communication and active patient involvement, monitoring patient satisfaction may help practitioners identify situations of poor communication (Cleary, Greenfield, Mulley, Parker, Schroeder, Wesler, McNeil, Clifford, Horvath, 1990, Collard, Bergman, Henderson, 1990).

Thus measures to increase patient satisfaction can contribute to a more positive health outcome for patients, as well as increasing the likelihood that satisfied patients will return (Hildman and Ferguson, 1990).

The literature reflects increasing awareness of patient satisfaction in healthcare delivery, but little attention has been given to the research use of the patient satisfaction instruments used (LaMonica, et al, 1986, Hildman and Ferguson, 1990).

The literature reflects accounts of increased patient satis-

faction with the use of case management. The New England Medical Center used case management with adult leukemia patients and reported increased satisfaction with care and a feeling they were in better control of what happened to them (Zander, 1988). Carondelet St. Mary's conducted research and evaluation of their case management program and found increased satisfaction as one of their outcomes (Falk, 1993). Tonges (1993), Hayes and Miller (1992), Mayer, et al (1990), Bigelow and Young (1991) all indicated that patient satisfaction increased when case management was used. Tonges (1993) indicated use of the Risser Patient Satisfaction Scale in evaluating patient satisfaction with nursing care. The other authors, did not indicate the tool used in measuring patient satisfaction. The literature revealed that although the Risser Patient Satisfaction Scale meets the criteria of an adequate tool, it was limited in that it measured satisfaction of patients, regarding specific nursing behaviors which did or did not occur. It was also developed for use with an ambulatory population, lacking items dealing with physical care and comfort measures which hospitalized patients judge of primary importance (LaMonica, et al., 1986, White, 1972).

Press Ganey Associates developed a survey which includes questions that touch not only nursing, but all major patient experiences with the hospital including: admissions, dietary, nursing, laboratory and x-ray, physicians, various "services" (physical and respiratory therapy), visitor and family issues,

discharge, and general interaction with staff (Press and Ganey, 1988).

This survey has been used in 89 of its client hospitals nationwide, and has involved over 50,620 patients. All hospitals use the same base of 49 questions plus additional customized questions if requested. The questions are grouped according to services. Press and Ganey (1988) report the margin for error in these data is 1 point.

This study will utilize the Press Ganey Survey to evaluate patient satisfaction when the case management model is utilized. This is an appropriate tool to use because case management affects all the patient's experiences with the hospital, not only nursing care. Press and Ganey (1988), did a study and found that characteristics such as bed size, teaching versus non teaching status, and the population size of the community affected the scores significantly. The Medicare and Medicaid load did not affect scores either way. Press and Ganey (1988), concluded that the manner in which mission and policy are translated into behavioral goals can make a difference in patient satisfaction. Case management can be one set of behavioral goals established by a hospital. This is supported by the fact that in the Press Ganey data base, patient/staff interaction issues are items most highly correlated with overall patient satisfaction.

Evaluation of Case Management

Health Outcomes

The literature review revealed demonstration projects in which nursing case managers from a variety of disciplines were used in an effort to modify hospital and nursing home use in the elderly, assist in the transition from hospital to home, and to increase the quality of care in community settings. The results of these projects showed little consistent impact on quality (Capitman, Haskins, Bernstein, 1986). The more recent models of case management which have been developed also have received limited evaluation of their impact on patient outcomes (Lamb, 1993). Evaluation of patient outcomes is a part of the continuum of the patient care process. Evaluation of outcomes should be based on established patient care goals (Beecroft, 1991, Lajeunesse, 1990). Collard, Bergman, and Henderson (1990), state that it is imperative to look at quality of care as defined by health outcomes, when studying the impacts of case management. Looking at quality of care as defined by health outcomes, assures that cost savings is not achieved at the expense of quality. Second, although case management may not always contribute to significant cost savings, it can sometimes facilitate significant improvement in the patient's quality of life (Collard, et al, 1990).

One method to assess quality and evaluate the effectiveness of the critical path is to use clinical standards of care.

Practitioners and insurers strongly urge the use of clinical standards as a mechanism for providing concrete benchmarks against which care can be assessed (Couch, 1991, Collard, et al., 1990, Henderson, Collard, 1988, Ellwood, 1988). This is of crucial importance with case management programs, as they vary considerably in their scope of service. The use of clinical standards was used by Collard, et al., (1990), and they found that clinical standards provided an easily implemented methodology with readily available data. The outcomes evaluated in this study are based on clinical standards of care approved by the hospital's Nurse Practice Council, and based on the American Nurses Association Standards (1980), and literature review, (Tucker, Canobbio, Paquette, Wells, 1991, American Nurses Association, 1987).

Chapter III

Methodology

Introduction

This study used a quasi experimental design to investigate the extent to which the nursing case management model (independent variable) versus the modified primary care model (independent variable) impacted quality outcomes. These outcomes were defined (by provider) as length of stay, (by professional) as outcomes to the interventions of standards of care, and (by patient) as satisfaction with hospitalization. Methodological triangulation was used to strengthen research results by looking at research results across three measures of the concept of quality after the treatment, case management was applied.

The purpose of this study was to evaluate the impact of the case management model versus the traditional modified primary care model used with surgical patients in an acute care setting and evaluate its impact on quality of care. Quality of care in this study was viewed from the viewpoint of the patient, professional, and provider. Quality of care in this study is operationalized:

1. From the viewpoint of the patient as patient satisfaction.

2. From the viewpoint of the professional in meeting desired health outcomes to standards of care.
3. From the viewpoint of the provider as a decrease in length of stay.

Study Population and Sample

The research investigation was conducted at a 630 bed acute care, university affiliated, urban city hospital in Detroit, Michigan. A convenience sample using patients at the study hospital was used. The patient population selected for participation in the investigation consisted of patients having an elective orthopedic procedure. The patients were located on either a 54 bed medical/surgical unit (Unit 25/26) or a 46 bed medical/surgical unit (Unit 27/28). The convenience sample used for criteria in patient sampling included patients within an age range of 18-88 years, with no comorbidities, undergoing simple elective orthopedic surgery.

The elective orthopedic surgical procedures included total hip replacement (DRG 209), and total knee replacement (DRG 109). These patients were included in the case managed (experimental) unit. The control group consisted of non-case managed patients undergoing the elective orthopedic surgical procedures of lumbar laminectomy (DRG 215) and cervical laminectomy (DRG 215). These patients

received nursing care based on the traditional model which was modified primary nursing. A non-random selection was used to assign patients to the control group and experimental group, as these groups developed naturally based on assignment by the admitting department.

To attempt to study "like" patients, this population was selected. The patients in both groups were similar in that they were elective rather than emergent patients. The literature review showed that emergent patients significantly affect the length of stay. It also showed that clinically related variables such as the patient's primary diagnosis, number of surgical procedures, and the number of secondary diagnosis were factors that had a significant impact on length of stay. The patients used in both groups had similar primary diagnosis -- orthopedic surgery, and they all had one surgical procedure with no secondary diagnosis. To keep the groups as similar as possible, patient who did not meet the above criteria were eliminated from the sample. There is no support from the literature, of any difference in preoperative anxiety levels between the two groups (Larson and Gould, 1978). The patient acuity levels and standards of patient care related to comfort, mobility, alteration in tissue healing and discharge planning are identical for both groups.

The health care provider population consisted of nursing and medical personnel. A non-random sample of nursing staff

participated in the study. The skill mix consisted of 60% Registered Nurses, 20% Licensed Practical Nurses, and 20% Nursing Assistants on both the experimental and control units. Both groups were comparable in relation to education, and length of service. The experimental group had one master prepared clinical nurse specialist, who functioned as case manager. The control group had a master prepared clinical nurse specialist who did not function as a case manager. Both clinical nurse specialists had similar professional and experiential histories. The medical personnel consisted of attending physicians on staff at Sinai Hospital.

Survey Instruments

The Press Ganey patient satisfaction survey was used to collect data by means of a telephone survey. The questionnaire followed guidelines appropriate to instrument construction and delivery defined by Babbie (1992), Dillman (1978) and Burns and Grove, (1993).

Permission was received to use in full the survey questionnaire utilized by Press Ganey. (See Appendix A)

Irwin Press and Rodney Ganey developed a questionnaire in 1985 after they discovered a lack of quality and sophistication in the methods used for patient satisfaction measurement. The pretesting of the Press Ganey Inpatient surveys enacted the development of

eleven different versions of the questionnaire. Various questions, answer scales, and formats were designed. Response frameworks that included "strongly agree" to "strongly disagree," "yes definitely" to "no definitely not," as well as the final choice of "very good" to "very poor" were tested. During the spring and summer of 1985, three hospitals used several versions of the survey during pretesting. The pretests included random distribution for a preset number of questionnaires (Press Ganey, Associates, Inc., 1992).

Research methodologist Rod Ganey, Ph.D., examined response rates for each version including the number of questions answered and the number of respondents. He performed statistical analysis, including looking for any pattern of response set bias, and looking at the skews and the kurtosis of each item to determine if normality was violated. A more detailed question analysis followed including an examination of means, standard deviations and standard errors. The goal was to identify questions that exhibited some variability and a good range of responses, rather than consistently high scores across all nursing units and hospital (Press Ganey, Assoc., Inc., 1992).

Questions were identified as a part of this process which had lower mean scores to ensure that questions were included that were sensitive to the problems patients experience.

Item analysis included running reliability analysis on all

answer scales and the overall composite evaluation of patient satisfaction. After questions were deleted, reliability coefficients were examined and a determination of the final instrument was made. The final instrument was checked for validity at the pretest hospitals and by professionals in the field. Press Ganey reports the margin for error in these data is 1 point (Press Ganey, 1988). The correlation coefficient for each item are included in Appendix B.

A second instrument used was a data collection form developed to include patient demographics, length of stay, and measurement of outcomes to nursing interventions. (See Appendix C.) This tool was developed utilizing the American Nurses Association's, **Standards and Scope of Orthopedic Nursing Practice, 1987**. Using this instrument, inter rater reliability was found to be at the .95 level of significance. This instrument recorded the health outcomes of patient comfort, mobility, incision healing, patient knowledge of incision care and discharge planning as being met or unmet. The demographic variables of age, marital status, procedure and length of stay were also recorded on this instrument.

Procedure

The data used for this study was collected over a period of 6 months from December 1, 1992 through June 1, 1993. Demographic data was collected from medical record review. Base line

information on length of stay of all DRGs in both groups was collected as a base line measurement to determine any decrease in length of stay. The health outcome measurement was collected by examining medical records and using the outcomes measurement tool (Appendix C).

All data was collected by the researcher both during the patient stay and retrospectively after discharge to determine length of stay and outcome measurement. Patient phone numbers and addresses were listed on each form, for telephone interviewing after discharge regarding their satisfaction level with their hospitalization.

The nursing case management model used for this study incorporates a collaborative approach utilizing all nursing personnel at various skill levels (Registered Nurses, Licensed Practical Nurses, and Nurses Aides). Case managers also work collaboratively with physicians and other members of the health care team including social workers.

The data needed to meet the objectives of the investigation required verification of the implementation of the case management model with the experimental group. This entailed a review of case management with all staff including physicians, and a clear delineation of the role with the case manager. The critical paths for the total hip and total knee patient were reviewed by all, and

incorporated into patient care. The case management model has been utilized for 2 years on twenty percent of the patients with varying diagnosis the experimental unit so a review will be sufficient preparation of the staff to understand the basic concepts. Staff will not be told a study is taking place as to avoid bias in outcomes. No previous empirical data has been conducted to evaluate the outcomes of the case management model on this group of patients as not all patients on the unit were subject to the case management model.

Upon discharge, patients were interviewed by telephone utilizing the Press Ganey survey of patient satisfaction (Appendix D). Calls were repeated 5 times, and if there was no answer, the survey was mailed out. The survey and the data related to length of stay, and outcome measurement was also collected upon discharge and analyzed.

A professional jury of sixteen senior administrative nursing personnel throughout the United States was used to validate the premises of this study and validate the relationship of the independent variable of case management and dependent variables of length of stay, patient satisfaction and health outcomes to standards of care. Sixteen of the administrative personnel were associated with large (bed size greater than 350 beds) urban hospitals, which were comparable to the institution at which this study was conducted. The response rate was 100% with validation of

100%. The names, titles and affiliated institutions are listed in Appendix D.

Data Analysis

Descriptive statistics were performed on all demographic data. The dependent variable of length of stay was examined in both groups and descriptive statistics were used. A "one-tailed" t-test for independent samples was done on each group at the .05 level of significance to determine the significance of the actual length of stay with the DRG length of stay.

Descriptive statistics were applied to both groups in considering the dependent variables of patient satisfaction, and the outcomes of comfort, mobility, incision healing, knowledge of how to care of the incision, and discharge planning. A "two-tailed" t-test for independent samples was done on each group with each variable at the .05 level of significance, to determine significant differences in the average of the means between both groups.

Because it was necessary to use a convenience sample for this study, homogeneity was used as a strategy to control for individual differences that may have affected patient length of stay, satisfaction with the hospitalization, and outcomes to the standards of care implemented. Restricting the patient sample to

patients undergoing an elective non-complicated orthopedic surgical procedure with the same acuity index and same standards of care that would be applicable to both, may have helped to control for the differences in gender, diagnosis and surgical procedure. However, limitations include threats to validity related to non-random selection. Another threat to validity is that the caregivers are not the same nursing staff in both groups. However, the percentage of Registered Nurses (RNs), Licensed Practical Nurses (LPNs) and Nursing Assistants (NAs) in both groups is the same. Because of turnover factors, staff will have varying levels of experience.

Another limitation involves the data collection with the telephone survey. The data collected may be flawed due to participant bias or indifference to the study or concern over anonymity. The score obtained from the Press Ganey Patient Satisfaction Survey may not be able to be generalized to all hospitals as scores can be affected by hospital size, whether the hospital is a teaching or non-teaching hospital, and the population size of the community.

The health outcomes will be measured by review of the medical records utilizing clinical standards of care. Limitations include the perceptual errors of the reviewer and lack of documentation by the care giver.

Findings may also be affected by medical interventions as patients are assigned to units based on physician and diagnosis. The lack of physician collaboration in working with the case manager and critical paths may influence the results.

Long Term Consequences

Providers, payers, and the general public are all looking for ways to provide quality health care at the most efficient cost. Case management is one model that may assist in this objective.

By looking at quality from the perspective of the provider, payer, and patient, all relevant parties in today's healthcare environment are included. Case management is a model that can be measured by outcomes of standards of care, length of stay, and patient satisfaction.

The findings from this study will provide some evaluative data for this particular hospital on the use of the case management model for elective surgical orthopedic patients.

The findings from this study will also provide information that can possibly be generalized to surgical patients in other healthcare settings in relation to improved quality of care at a decreased cost. The results of this research will also contribute to the current knowledge of the relationship of case management on

clinical and cost outcomes. This study may also provide a basis for future research on the impact of case management on other hospitalized patients and case types such as medical, geriatric, psychiatric, and long term.

Chapter IV

Results

This chapter attempts to review each research question in terms of its major research findings. The first section describes the general data base. The second section presents an analysis of length of stay data. The third section presents findings from the patient satisfaction instrument used for both groups. The fourth section presents an analysis of outcomes of the clinical standards of care utilized for both groups.

General Data Base

This section identifies the general data base collected between the experimental and control groups over the six month study period from December 1, 1992 through June 1, 1993.

Experimental Group

The data base collected on the experimental group (Units 27/28) consisted of four hundred and fifty-one (451) patient days from a total sample size of fifty-five patient subjects. The mean length of stay was equivalent to 8.20 patient days. The total hip and total knee case types (DRG 209) were selected for study. Demographic characteristics are exhibited in Table 1. The Federal Guidebook (1993) lists DRG 209 as major joint and limb reattachment procedures - lower extremity with a mean length of 9.6 days.

Control Group

The data base collected on the control group (Units 25/26) consisted of one hundred and ninety (190) patient days from a total sample size of 43 patients. The mean length of stay for lumbar and cervical laminectomy patients (DRG 215) was 4.42 days. The Federal Register (1993) defines DRG 215 as back and neck procedures without complications. The national mean length of stay is equivalent to 5.3 days. The demographic characteristics of the control group are presented in Table 1.

Analysis of Problems

This section will be divided into three sections. The first section will report the results of the statistical tests done on the first research question, after restating the question. This same format will be followed for the second and third section.

Research Question I stated: What is the impact of a nursing case management model versus a traditional modified primary care model on the length of stay of patients hospitalized for an elective surgical procedure in an acute care setting?

Table 1
Demographic Variables

	Experimental		Control	
Age:				
Age Ranges	24-88		18-83	
Age Mean	66.39		53.44	
Standard Deviation	13.44		16.00	
Sex:	<u>Frequency</u>	<u>Percent</u>	<u>Frequency</u>	<u>Percent</u>
Female	42	75	24	55.8
Male	14	25	19	44.2
Marital Status:	<u>Frequency</u>	<u>Percent</u>	<u>Frequency</u>	<u>Percent</u>
Divorced	5	8.9	3	7
Married	30	53.6	25	58.1
Single	6	10.7	7	16.3
Widowed	15	26.8	8	18.6

The mean length of stay and standard deviation for both groups were calculated (Table 2). Comparison was made between the national mean length of stay for both groups versus the actual lengths of stay. Because the groups were not the same DRGs and had different lengths of stay, the difference between the actual versus the national mean of length of stay of the DRGs was calculated. The difference between a decrease in length of stay of DRG 209 (total hip and total knee) was compared to the decrease in length of stay of DRG 215 (spinal procedures without complications). The experimental group reported a mean length of stay of 8.2 days. The difference between the national mean length of stay of 9.6 days and this group was a decrease of 1.4 days. The control group reported a mean length of stay of 4.42 days. The difference between the national mean length of stay of 5.3 days and this group was a decrease of .85 days. This indicated a decrease in length of stay of .52 days in the total experimental group.

a mean length of stay of 4.42 days. The difference between the national mean length of stay of 5.3 days and this group was a decrease of .85 days. This indicated a decrease in length of stay of .52 days in the total experimental group.

The means of each group were subject to a two-tailed t-test for independent samples (Table 2). The case managed group showed a statistically significant difference in length of stay between the mean length of stay and DRG length of stay (*p = .000). The non-case managed group did not show a statistically significant difference (p = .092).

Table 2

Comparison of Mean Length of Stay (LOS) Between the Case Managed (Experimental) and Non-Case Managed (Control Group)

	Experimental	Control
Number of cases	55	44
Mean	8.2	4.42
DRG Length of Stay	9.6	5.3
Standard Deviation	1.97	3.35
t-Value	- 5.28	- 1.72
Degrees of Freedom	54	42
Two-Tail Probability	.000*	.092

Note.

- a) p < .05
- b) * indicates significance

Research Question II

Research Question II stated: What is the impact of a nursing case management model versus a traditional modified primary care model on a patient's perception of satisfaction while hospitalized for an elective surgical procedure in an acute care setting?

The data was obtained using the Press Ganey patient satisfaction survey instrument. The rate of return was 68%. This instrument measures the overall hospital rating of all areas involved with a patient's hospitalization. The survey is divided into ten specific areas with a number of questions in each area (Appendix A).

The overall patient satisfaction score of the case managed group was 83, while the overall score of the non-case managed patients was 84 (Table 3). The ten section score are summarized in Table 4. The section upon which case management should have the greatest impact is "Overall Nursing Rating." As shown in Table 4, the experimental group had a score of 87 while the control group had a score of 83. A two-tailed t-test failed to show a statistically significant difference between the groups on the "Overall Nursing Rating" score (Table 5).

Table 3

**Overall Hospital Ratings of Patient Satisfaction
Between Experimental and Control Groups**

	Experimental	Control
Number of cases	36	32
Mean	83	84
Standard Deviation	11.6	11
Standard Error	2	2
t-Value	-	-
.42		
Degrees of Freedom		
65.56		
Two-Tail Probability		
.675		

Note.

- a) $p < .05$
- b) * indicates significance

Table 4
Press Ganey Patient Satisfaction
Summary Report
(December 1, 1992 - June 1, 1993)

	Unit Group Group A Group Z N = 36 N = 32	
*** Overall Hospital Rating	83	84
* Overall Admissions Rating	89	91
* Overall Room Rating	70	73
* Overall Meals Rating	68	81
** Overall Nursing Rating	87	83
* Overall Tests & Treatments	83	84
Rating	85	92
* Overall Services Rating	86	85
* Overall Visitors & Family	88	85
Rating	91	87
* Overall Physician Rating	86	88
* Overall Discharge Rating		
* Overall Final Rating		

Note.

- a) Group A refers to case managed patients
- b) Group Z refers to non-case managed patients
- c) * Refers to overall categories of questions
- d) ** Refers to questions on which case managers could have a significant impact
- e) ***Refers to overall survey score.

Table 5
Overall Nursing Rating of Patient Satisfaction
Between Experimental and Control Groups

	Experimental	Control
Number of cases	36	32
Mean	87	83
Standard Deviation	15.1	17.9
Standard Error	2.518	3.1
t-Value		
.88		
Degrees of Freedom		
60.9		
Two-Tail Probability		
.382		

Note.

- a) $p < .05$
- b) * indicates significance

Within the section of the Press Ganey survey that is related to overall Nursing Care there were seven questions that could be impacted by case management. These questions are highlighted in Table 6. Two-tailed t-tests were done on the mean scores of these specific questions in both the experimental and control group. The results shown in Table 7 indicate no statistical significance between the groups.

Table 6
Press Ganey Patient Satisfaction
Summary Report
(December 1, 1992 - June 1, 1993)

	Unit Group	
	Group A N = 36	Group Z N = 32
Nurses' Friendliness	90	91
Nurses' Promptness	80	74
Nurses' Attitude to Call	88	85
** Nurses' Took Problem Seriously	92	80
** Nurses' Attention to Special Needs	82	78
** Nurses' Informative re. Tests	86	82
Technical Skill of Nurses	89	91
** Nurses' Help Coping with Condition	86	78
** Nurses' Info.re Condition & Progress	84	80
T and T Skill in Taking Blood	81	88
T and T Courtesy of Technician	89	91
T and T Skill in Starting IV	81	83
T and T Courtesy of IV Starter	86	90
T and T Length of Wait for X-Ray	79	69
T and T X-ray Tech. Concern for You	80	83
** T and T Explanations	76	78
** Adequacy of Info Given Family	90	86
** Adequacy of Advice for Home Care	89	86

Note.

- a) Group A refers to case managed patients
b) Group Z refers to non-case managed patients
c) * Refers to overall categories of questions
d) ** Refers to questions on which case managers could
have a significant impact
e) ***Refers to overall survey score.

Table 7

Comparison of Scores between Experimental and Control Group
which can be Impacted by Case Management Nurses'
Information (given to patients) regarding Test

	Group A	Group Z
Number of Cases	36	31
Mean	88.8889	91.129
Standard Deviation	21.082	12.159
Standard Error	3.514	2.184
Separate Variance		
Estimate:		
t-Value	- .54	
Degrees of Freedom	57.29	
Two-Tail Probability	.590	

Nurses' Helping You Cope with your Condition

	Group A	Group Z
Number of Cases	35	32
Mean	85.7143	78.1250
Standard Deviation	22.101	28.220
Standard Error	3.736	4.989
Separate Variance		
Estimate:		
t-Value	1.22	
Degrees of Freedom	58.69	
Two-Tail Probability	.228	

Note.

- a) Group A refers to case managed patients (Experimental Group)
- b) Group Z refers to non-case managed patients (Control Group)
- c) $p < .05$
- d) * indicates significance

Table 7

Nurses Took Problem Seriously

	Group A	Group Z
Number of Cases	36	31
Mean	91.6667	79.8387
Standard Deviation	13.363	26.156
Standard Error	2.227	4.698
Separate Variance		
Estimate:		
t-Value	2.28	
Degrees of Freedom	43.13	
Two-Tail Probability	.028	

Nurses Attention to Special Needs

	Group A	Group Z
Number of Cases	36	31
Mean	81.9444	78.2258
Standard Deviation	26.465	28.681
Standard Error	4.411	5.151
Separate Variance		
Estimate:		
t-Value	.55	
Degrees of Freedom	61.69	
Two-Tail Probability	.585	

Note.

- a) Group A refers to case managed patients (Experimental Group)
- b) Group Z refers to non-case managed patients (Control Group)
- c) $p < .05$
- d) * indicates significance

Table 7
Test and Treatment Explanations

	Group A	Group Z
Number of Cases	20	15
Mean	76.2500	78.3333
Standard Deviation	31.908	29.681
Standard Error	7.135	7.664
Separate Variance		
Estimate:		
t-Value	- .20	
Degrees of Freedom	31.40	
Two-Tail Probability	.844	

Information Given Regarding Your Treatment and Progress

	Group A	Group Z
Number of Cases	36	32
Mean	84.0278	80.4688
Standard Deviation	23.263	28.209
Standard Error	3.8777	4.987
Separate Variance		
Estimate:		
t-Value	.56	
Degrees of Freedom	60.29	
Two-Tail Probability	.575	

Note.

- a) Group A refers to case managed patients (Experimental Group)
- b) Group Z refers to non-case managed patients (Control Group)
- c) $p < .05$
- d) * indicates significance

Table 7
Information Regarding Diet

	Group A	Group Z
Number of Cases	13	4
Mean	55.7692	81.2500
Standard Deviation	39.731	37.500
Standard Error	11.019	18.750
Separate Variance		
Estimate:		
t-Value	- 1.17	
Degrees of Freedom	5.27	
Two-Tail Probability	.292	

Note.

- a) Group A refers to case managed patients (Experimental Group)
- b) Group Z refers to non-case managed patients (Control Group)
- c) $p < .05$
- d) * indicates significance

Research Question III

Research Question III stated: What is the impact of a nursing case management model versus a modified primary care model on quality of care as defined by health outcomes of patients hospitalized for an elective surgical procedure in an acute care setting?

The data was obtained using the developed outcomes measurement tool (Appendix C). The outcomes of comfort, mobility, incision care, patient knowledge of incision care, and discharge planning were recorded as being met or unmet. Cross tabulation by group on

each of these outcomes was done (Table 8). A t-Test performed on the means of both groups in these same outcome measures revealed statistically significant findings in the case managed group in the outcome measures of mobility, incision care, patient knowledge of incision care, and discharge planning (Table 9).

Table 8

**Frequencies of Health Outcome Data in the
Experimental and Control Group**

	Experimental Group		Control Group	
	Frequency	Percent	Frequency	Percent
<u>Comfort:</u>				
Unmet	5	9	7	16
Met	51	91	36	84
<u>Mobility:</u>				
Unmet	9	16	22	51
Met	47	84	21	49
<u>Incision Care:</u>				
Unmet	5	9	11	26
Met	51	91	32	74
<u>Patient Knowledge of Incision Care:</u>				
Unmet	9	16	19	44
Met	46	82	56	56
Missing	1	1.8		
<u>Discharge Planning:</u>				
Unmet	4	7	15	35
Met	52	93	26	61
Missing			2	4

Table 9

**Significance of Health Outcomes between
Experimental and Control Groups**

	Group A	Group Z
t-Test for: Comfort		
Number of Cases	56	43
Mean	.9107	.8372
Standard Deviation	.288	.374
Standard Error	.038	.057

Separate Variance Estimate:

t-Value 1.07
Degrees of Freedom 76.81
Two-Tail Probability .288

	Group A	Group Z
t-Test for: Mobility		
Number of Cases	56	43
Mean	.8393	.4884
Standard Deviation	.371	.506
Standard Error	.050	.077

Separate Variance Estimate:

t-Value 3.83
Degrees of Freedom 74.14
Two-Tail Probability *.000

Note.

- a) Group A refers to case managed patients (Experimental Group)
- b) Group Z refers to non-case managed patients (Control Group)
- c) $p < .05$
- d) * indicates significance

Table 9

**Significance of Health Outcomes between
Experimental and Control Groups**

	Group A	Group Z
t-Test for: Incision Care		
Number of Cases	56	43
Mean	.9107	.7442
Standard Deviation	.288	.441
Standard Error	.038	.067

Separate Variance Estimate:
t-Value 2.15
Degrees of Freedom 68.32
Two-Tail Probability *.035

	Group A	Group Z
t-Test for: Patient Knowledge of Care of Incision		
Number of Cases	55	43
Mean	.8364	.5581
Standard Deviation	.373	.502
Standard Error	.050	.077

Separate Variance Estimate:
t-Value 3.03
Degrees of Freedom 75.19
Two-Tail Probability *.003

Note.

- a) Group A refers to case managed patients (Experimental Group)
- b) Group Z refers to non-case managed patients (Control Group)
- c) $p < .05$
- d) * indicates significance

Table 9

**Significance of Health Outcomes between
Experimental and Control Groups**

	Group A	Group Z
t-Test for: Discharge Planning		
Number of Cases	56	41
Mean	.9286	.6341
Standard Deviation	.260	.488
Standard Error	.035	.076

Separate Variance Estimate:
t-Value 3.52
Degrees of Freedom 56.58
Two-Tail Probability *.001

Note.

- a) Group A refers to case managed patients (Experimental Group)
- b) Group Z refers to non-case managed patients (Control Group)
- c) $p < .05$
- d) * indicates significance

Chapter V

Summary and Discussion of Findings

Chapter V presents a summary and discussion of the major findings of this study. Some limitations and implications of the study, along with recommendations for future research are included in this chapter.

Discussion of Findings

In this study, Research Question I addressed: What is the impact of a nursing case management model versus a traditional modified primary care model, on the length of stay for patients hospitalized for an elective surgical procedure in an acute care setting?

In this study, patient length of stay was designated as a quality measure from the viewpoint of the provider. The extent to which nursing case management (independent variable) versus modified primary care (independent variable) impacted patient length of stay (dependent variable) was studied by a two-tailed t-test for independent samples. The case managed group showed a statistically significant difference in a decreased length of stay between the mean length of stay and DRG length of stay ($p < .05$). As discussed in Chapter IV of this study, the case managed group showed a decrease of 1.4 days between its mean length of stay and

DRG length of stay. The modified primary care model group showed a decrease of .88 days. Thus, the answer to Research Question I reveals a significant decline in length of stay for patients case managed for an elective surgical procedure in an acute care hospital. The results of this analysis are consistent with earlier studies conducted by Cohen (1991), Koerner (1993), Brett, Tonges, and Bradley (1986) that presented empirical data which indicated a decrease in length of stay with case managed groups of patients. The results of the present study show that by coordinating inpatient services, nursing case management can produce a decrease in patient length of stay for specific case types, in particular elective, non-complicated orthopedic surgery cases.

Research Question II addressed: What is the impact of a nursing case management model versus a traditional modified primary care model on patient's perception of satisfaction while hospitalized for an elective surgical procedure in an acute care setting?

In this study patient satisfaction was used as a quality measure from the viewpoint of the patient. The extent to which nursing case management versus a traditional modified primary care model impacted patient's perception of satisfaction was studied by comparing the overall patient satisfaction scores of both groups using the Press Ganey survey in a telephone interview. The overall score of the case managed group was 83, while the overall score of

the non-case managed group was 84. A two-tailed t-test was done on the section of the survey rating "Overall Nursing Care," which failed to show a statistically significant difference between the groups. Within the section of the Press Ganey survey related to Overall Nursing Care, there were seven questions that could be impacted by case management. Two-tailed t-tests performed on these seven questions failed to show a statistical difference between the groups. Thus, the answer to Research Question II is that there is no impact of a nursing case management model versus a traditional modified primary care model on patient's perception of satisfaction while hospitalized for an elective surgical procedure in an acute care setting.

This finding was inconsistent with the literature which reported increased patient satisfaction with the use of case management (Zander, 1988, Falk, 1993, Tonges, 1993, Hayes and Miller, 1992). The literature, however, did not present any studies that used the Press Ganey Patient Satisfaction Survey to measure patient satisfaction. The only instrument identified in the literature used to measure patient satisfaction was the Risser Patient Satisfaction Scale (Tonges, 1993). This instrument was developed for use with an ambulatory population, rather than inpatient population, and thus, was not acceptable for use in this study.

Research Question III addressed: What is the impact of a

nursing case model versus a traditional modified primary care model on quality of care as defined by health outcomes of patients hospitalized for an elective surgical procedure in an acute care setting?

In this study, the health outcomes of appropriate standards of care for patients undergoing elective orthopedic surgery included: comfort, mobility, incision healing, patient knowledge of care of the incision and discharge planning. Cross tabulation by groups on each of these outcomes showed a higher number of met outcomes versus not met outcomes in the case managed group. A two-tailed t-test done on each outcome in both groups showed a statistically significant difference in met outcomes in the case managed group. Thus, the Research Question III was answered affirmatively because there was a significant impact on case managed patients in all outcomes (Table 9) except the comfort outcome where $p = .288$.

The literature review revealed limited evaluation of case management on patient outcomes (Lamb, 1993). In one study of the use of case management in community settings, there was little consistent impact on quality (Capitman, Haskins, Bernstein, 1986). The findings of this study present new data which will be of interest to the professional in the healthcare setting, who measures the quality of care based on outcomes.

Limitations

Some of the limitations which were addressed in terms of their effects on the internal and external validity of the study included the following:

- I. **History, maturation, mortality, and instrumentation effects**
 1. The method used for measuring health outcomes was time consuming and results gathered were dependent on the objective and subjective views of the researcher. Limitations included lack of documentation of the care giver and possible perceptual errors of the researcher.
 2. The data collected (by telephone survey) using the Press Ganey survey may have been flawed due to participant bias, indifference to the study or concern over anonymity. Patients may withhold true feelings because they may fear repercussions if they are readmitted to the same hospital.
 3. The Press Ganey scores obtained in this study cannot be generalized to all hospitals as scores can be affected by: size of the community; urban versus rural setting; and teaching versus non-teaching.
 4. Findings may be affected by medical interventions because

physicians must write the orders for treatments and discharge. A case manager can collaborate and suggest opinions to the physician, but cannot override his orders. The lack of physician collaboration in working with the case manager and critical paths may influence the results.

II. Sample and Testing

1. The sample used for both groups was a non-random convenience sample. This was necessary because of the hospital protocol to place patients on units by physician. The patients undergoing total hip and total knee replacement are always placed on one unit (Unit 27/28) and the laminectomy patients are always placed on another (Unit 25/26). This situation could not be changed for this study. This presented limitations as the two groups were not identical and random selection was not used. However, every effort was made to keep the groups as similar as possible. Thus, only elective, orthopedic, non-complicated cases were selected. This resulted in the elimination of eight cases in the experimental (case managed) group and five cases in the control (modified primary care) group.
2. Another limitation, due to the fact that the experimental and control groups were on different units, might have occurred because of two different groups of nurses caring for the

patients. Although the units were selected because of the consistency in percentage mix of RNs (60%), LPNs (20%), and NAs (20%) and consistency in educational levels of the staff, patient outcomes and their perception of outcomes may have been affected by staffing issues, turnover factors, and acuity level of other patients on the unit.

Implications and Recommendations

This study was beneficial in demonstrating the quality implications of a case management model used for inpatients undergoing a surgical procedure in an acute care setting. The use of this case management model enabled:

1. Early patient discharge.
2. Meeting desired clinical outcomes.
3. Promotion of coordination of care and continuity of care by discharge planning.
4. A new strategy of growth to be used in a changing environment being influenced by third party payers and managed care organizations.

This study of the case management model presented significant

implications for the health care field and society. Economic issues in health care have become a primary factor in the 1990s. All sections of business, government, and the general public are demanding health care at a lower cost. One strategy is to have professional nurses coordinate and assess the economics and efficiency of patient treatments, procedures, and hospitalization. This links together the interests of the professional nurse and outside socio-economic institutions. The case management framework provides data on the resources actually used for specific patients. This information can be used to define patient care protocols including the use of resources in an attempt to control costs. These protocols or pathways for specific diagnosis can then be compared to patient outcomes. Managed care companies and the government would look favorably on any hospital increasing health outcomes and decreasing costs.

Additional research needs to be done utilizing case management and critical pathways on groups of patients with medical diagnosis. Medical patients' course of treatment is not usually as well defined as elective surgical patients. This data could be used to better identify costs and protocols in the management of multi-system medical problems.

Another implication is related to assessment of the critical path and its use. The critical path is a day-to-day outline of the key events that must occur to achieve the prescribed goals within

a designated length of stay (Bower, 1992). Additional research could evaluate the critical path's reliability and validity.

Continued study needs to be done on the quality of patient care related to patients' perception of satisfaction. Additional research should be done using instruments that may be more sensitive to patients' perception of satisfaction with various models of care delivery. Research needs to be done looking at the effects of case management on the satisfaction level of the nurse, physician and interdisciplinary team; the payment and reimbursement mechanisms for case management inpatient and outpatient services; types of case management interventions and effects of specific interventions on patient outcomes; staffing and assignment duties for healthcare team members with the use of a case manager model; specific cost of case management models; and charges and reimbursement for case managed patients.

Societal demands are forcing providers to consider alternate methods of care delivery. Case management uses the skills of the professional nurse at a level suitable to her education and competencies. Further research is needed to identify various means of utilizing different skill levels of healthcare providers to enhance efficient and effective outcomes. This study successfully used the master prepared clinical nurse specialist as a case manager with the support staff of RNs, LPNs and Nursing Assistants. The case manager coordinated, assessed, implemented and evaluated care delivery in collaboration with the multidisciplinary team.

Conclusions

It is essential to look at the redesign of our healthcare delivery systems to improve quality and control costs. Case management is one model that can measure interventions and outcomes within designated time frames. Case management can coordinate the fragmented care resulting in a decreased length of stay. It can also coordinate care using a critical path which provides a concise plan of care for all health team members. This results in meeting desired outcomes of the plan of care.

Since the inception of DRGs, attention has been focused on the length of stay because length of stay is an important indicator of a hospital's financial performance. The findings of this study indicated length of stay variables could be used with the case management model to evaluate cost effectiveness.

The literature supports quality improvement with the use of case management, but little empirical data exists. This study provided significant differences in positive health outcomes of case managed patients. Healthcare providers are aware that the survivors in today's environment will be those who combine cost effective processes with quality outcomes.

This study also provided further development of the system theory as a theoretical base for case management. The literature

to date reveals a lack of a clear theoretical framework. The system theory in case management looks at the patient as a whole and focuses on the collaborative and multidisciplinary approach, rather than the decentralized department approach. It considers case management as an open system that can be affected by its internal and external constraints.

Although case management is considered to be in its early stages of development, there are several relationships being revealed by studies. These include:

1. The relationship between coordination of care and a decrease in length of stay.
2. The relationship between coordination of care and the meeting of desired health outcomes.
3. The relationship between coordination of care and a decrease in costs.
4. The relationship between collaboration of patient's care and increased patient and provider satisfaction.

Further research is needed on case management and its relationships to cost, outcomes, and patient and provider satisfaction. This research will help to meet societal's demand for affordable healthcare with quality outcomes.

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APPENDIX A

PATIENT SURVEY

INSTRUCTIONS: Please rate the following services you received while in our hospital. Circle the number that best represents your feeling. If you had no experience with a particular item, skip to the next question.

Also comment on any negative or positive experience you might have had in each area.

When you've completed the survey, please mail it back in the enclosed envelope. THANKS!

General Questions (fill in)

- | | | | |
|--|-------|----------------------------------|-------|
| 1. Your room number? | _____ | 6. Have a roommate? (Y/N) | _____ |
| 2. Number of days in hospital? | _____ | 7. On a special diet here? (Y/N) | _____ |
| 3. Date of discharge? | _____ | 8. Your sex? (M or F) | _____ |
| 4. Your first stay here? (Y/N) | _____ | 9. Your age? | _____ |
| 5. Were you admitted through the emergency room? (Y/N) | _____ | 10. Your name?
(Optional) | _____ |

	very poor	poor	fair	good	very good
A. Admissions					
1. Speed of the admissions process	1	2	3	4	5
2. Courtesy of admissions personnel	1	2	3	4	5

Comments (describe good or bad experience): _____

B. Your Room

1. Cheerfulness	1	2	3	4	5
2. Daily cleaning	1	2	3	4	5
3. Room temperature	1	2	3	4	5
4. Noise level in and around room	1	2	3	4	5
5. How well things worked (T.V., call button, lights, bed, etc.)	1	2	3	4	5
6. Courtesy of the person who cleaned your room	1	2	3	4	5

Comments (describe good or bad experience): _____

C. Diet and Meals

1. Explanations you were given about your diet if you were on a special diet	1	2	3	4	5
2. Temperature of the food (cold foods cold, hot foods hot)	1	2	3	4	5
3. Quality of the food	1	2	3	4	5
4. Likelihood of getting the food you checked off on the menu	1	2	3	4	5

Comments (describe good or bad experience): _____

D. Nursing Care

1. Friendliness of the nurses	1	2	3	4	5
2. Promptness in responding to the call button	1	2	3	4	5
3. Nurses' attitude toward your calling them	1	2	3	4	5
4. Degree to which the nurses took your health problem seriously ..	1	2	3	4	5
5. Amount of attention paid to your special or personal needs	1	2	3	4	5
6. Degree to which nurses kept you adequately informed about tests, treatment, and equipment	1	2	3	4	5
7. Technical skill of the nurses	1	2	3	4	5

Comments (describe good or bad experience): _____

APPENDIX A

	very poor	poor	fair	good	very good
E. Tests and Treatments					
1. How well your blood was taken (quick, little pain, etc.).....	1	2	3	4	5
2. Courtesy of the person who took your blood.....	1	2	3	4	5
3. How well IVs were started (quick, little pain, etc.).....	1	2	3	4	5
4. Courtesy of the nurse who started the IV.....	1	2	3	4	5
5. Length of time you had to wait in the X-ray department.....	1	2	3	4	5
6. X-ray technicians' concern for your comfort.....	1	2	3	4	5
7. Adequacy of explanations of tests and treatments.....	1	2	3	4	5

Comments (describe good or bad experience): _____

	1	2	3	4	5
F. Other Services					
1. Volunteers.....	1	2	3	4	5
2. Physical therapy.....	1	2	3	4	5
3. Respiratory care.....	1	2	3	4	5
4. Social services.....	1	2	3	4	5
5. Staff who transported you to and from your room.....	1	2	3	4	5

Comments (describe good or bad experience): _____

	1	2	3	4	5
G. Visitors and Family					
1. Courtesy of the people at the information desk.....	1	2	3	4	5
2. Adequacy of visiting hours.....	1	2	3	4	5
3. Accommodations and comfort for visitors.....	1	2	3	4	5
4. Nursing attitudes toward your visitors.....	1	2	3	4	5
5. Information given your family about your condition & treatment.....	1	2	3	4	5
6. Visitors' rating of the hospital cafeteria/coffee shop.....	1	2	3	4	5

Comments (describe good or bad experience): _____

	1	2	3	4	5
H. Your Physician					
1. Amount of time your physician spent with you.....	1	2	3	4	5
2. Physician's concern for your questions and worries.....	1	2	3	4	5
3. How well the physician kept you informed about treatments.....	1	2	3	4	5
4. How informative physician was in dealing with your family.....	1	2	3	4	5

Comments (describe good or bad experience): _____

	1	2	3	4	5
I. Discharge					
1. Hospital's concern not to discharge you too soon.....	1	2	3	4	5
2. When you were told you could go home, the time you had to wait before you were able to leave the hospital.....	1	2	3	4	5
3. Advice you were given about how to care for yourself at home ...	1	2	3	4	5
4. Courtesy and assistance you received from the business office ...	1	2	3	4	5

Comments (describe good or bad experience): _____

	1	2	3	4	5
J. Some Final Ratings					
1. Overall cheerfulness of the hospital.....	1	2	3	4	5
2. Staff concern for your privacy.....	1	2	3	4	5
3. Staff sensitivity to the inconvenience that health problems and hospitalization can cause.....	1	2	3	4	5
4. Likelihood of your recommending this hospital to others.....	1	2	3	4	5

Comments (describe good or bad experience): _____

Appendix B
Correlation Coefficients
August 1992
Items with a Minimum 50% Response Rate

<u>Item</u>	<u>Correlation</u>
Overall Cheerfulness of Hospital	.77
Staff Sensitivity to Inconvenience	.74
Courtesy of Business Office	.73
Staff Concern for Your Privacy	.72
Technical Skills of the Nurses	.72
Likelihood of Recommending Hospital	.71
Discharged too Soon	.71
Nurses Attitude to Call	.70
Adequacy of Information Given Family	.69
Nurses Took Problem Seriously	.69
Nurses Informative Regarding Tests	.69
Nurses Attention to Special Needs	.68
T and T Explanations	.68
Adequacy of Advice for Home Care	.67
Staff Who Transported You	.66
Courtesy of Information Desk Personnel	.66
Physician's Information Regarding Treatments	.65
Volunteers	.65
Nursing Attitude Toward Visitors	.65
T and T Courtesy of Technician	.64
Nurses Friendliness	.64
T and T Xray Technician Concern for You	.64
Physician's Concern Regarding Questions	.64
T and T Courtesy of IV Starter	.64
Nurses Promptness	.65
Time Physician Spent with You	.63
Physician's Information to Family	.63
Cheerfulness of Room	.63
Accommodations for Visitors	.62
Courtesy of Admissions Personnel	.60

Appendix B

Correlation Coefficients

August 1992

Items with a Minimum 50% Response Rate

<u>Item</u>	<u>Correlation</u>
Adequacy of Visiting Hours	.60
T and T Skill in Taking Blood	.57
Speed of Admissions	.56
Information Regarding Diet	.55
Temperature of Food	.53
T and T Length of Wait for Xray	.53
Daily Cleaning of Room	.52
Courtesy of Cleaning Personnel	.52
TV, Call Button Etc., Working	.52
Received What You Ordered	.50
Quality of Food	.50
Temperature of Room	.50
T and T Skill in Starting IV	.50
Cafeteria/Coffee Shop	.50
Parking	.47
Noise Level	.21

APPENDIX C

SINAI HOSPITAL
DIVISION OF NURSING

Outcomes for Surgical Patients:

OUTCOME CRITERIA		TIME FRAME	MET	NOT MET
I.	<p><u>Alteration in comfort:</u></p> <p>Outcome: The patient/significant other will:</p> <ol style="list-style-type: none"> 1. Verbalize/demonstrate increased comfort or relief of pain AEB: <ol style="list-style-type: none"> a. Verbalize a decrease in level of pain on scale of 0-10. b. Decrease agitation. c. Relaxed facial expression and body positioning. d. Absence of/or decreased autonomic response, e.g., diaphoresis, blood pressure and pulse rate, pupillary dilation, increase or decrease in respiratory rate. e. Absence of nausea and vomiting. f. Participation in activities. 	0 ->		
II.	<p><u>Impaired Physical Mobility:</u></p> <p>Outcome: The patient and/or significant other (S.O.) will:</p> <ol style="list-style-type: none"> 1. Verbalize activity and position restrictions 2. Demonstrate the correct transfer and ambulation techniques and proper use of special equipment. 	Prior to discharge	1) 2)	1) 2)
III.	<p><u>Impaired Skin/Tissue Integrity Related to Surgical Incision:</u></p> <p>Outcome:</p> <ol style="list-style-type: none"> 1. Incision edges will be approximated with granulation tissue present. 2. Patient/significant other will demonstrate prescribed incision care and will verbalize plan for follow-up care post-discharge. 	7 days post surgery Prior to discharge	1) 2)	1) 2)
IV.	<p><u>Appropriateness of Discharge Planning for inpatients as evidenced by:</u></p> <ol style="list-style-type: none"> 1. Continuing care needs identified and health care referrals made based on home criteria for skilled care. 			
V.	<u>Procedure:</u>			
VI.	<u>Demographics:</u>			
	<ol style="list-style-type: none"> 1. Sex. 2. Marital status. 3. Age. 			
VII.	<u>Length of Stay:</u>			

APPENDIX D

Professional Jury Contacts

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APPENDIX D

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VITA

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