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The relationship between nursing unit work and structure as it relates to the functional health of elderly patients

Brinker, Deborah Joan, Ph.D.

Case Western Reserve University (Health Sciences), 1993
THE RELATIONSHIP BETWEEN NURSING UNIT WORK AND STRUCTURE AS IT RELATES TO THE FUNCTIONAL HEALTH OF ELDERLY PATIENTS

by
Deborah J. Brinker

Submitted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy

Department of Nursing
Case Western Reserve University

January, 1993
We hereby approve the thesis of

Deborah J. Brinker

candidate for the Ph.D.
degree.*

(signed)

(chair)

Fayella Jarrah

M. Jay Wyble

date 11-16-92

*We also certify that written approval has been obtained for any proprietary material contained therein.
THE RELATIONSHIP BETWEEN NURSING UNIT WORK AND STRUCTURE AS IT RELATES TO THE FUNCTIONAL HEALTH OF ELDERLY PATIENTS

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Abstract

The purpose of this study was to describe the relationship between nursing unit work and staff structure as it relates to the functional health of elderly patients. The significance of the present study lies in its contribution to theory development for nursing science and nursing administration. First, this study provides insight into the applicability of the task contingent model in predicting patient outcomes. Alternative ways of viewing the dimensions of structure in relation to patient outcomes are also proposed. Secondly, the study reaffirms the importance of measuring functional health as a patient outcome.

The theoretical framework for the present study was developed by transforming Van de Ven and Ferry’s (1980) task contingent model from King’s (1981) perspective of nursing. From this perspective, work on a nursing unit refers to effort directed at improving the functional health of the unit’s patients. The patients of interest in this study were elderly patients.
To conduct this study, a descriptive correlational design was used on a sample of 20 nursing units. The nursing units for this study were obtained 4 per hospital, from 5 randomly selected hospitals of a midwestern city. Participation was then obtained from 20 head nurses, 168 staff nurses, and 200 elderly patients. The units’ inclusion criteria focused on obtaining units that cared for elders who were discharged to the community and were not psychiatric or specialty units.

To measure the variables of interest, two instruments were used and the data was aggregated to produce unit level measures. For the dependent variable, functional health, the Activities of Daily Living Section (ADLS) of the OARS Multidimensional Functional Assessment Questionnaire (OMFAQ) was used for admission and discharge interviews with elderly patient participants from each unit. Van de Ven and Ferry’s (1980) Organizational Assessment Instruments (OAI) were administered to head nurse and staff participants to measure the independent variables, which include the characteristics of work and the dimensions of structure. Data obtained from all measures was then analyzed using multiple regression.
DEDICATION

To my grandparents, Eleanor and Vernon Huddleston, and my aunt, Marilyn Huddleston.
ACKNOWLEDGEMENTS

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I would like to thank my committee members, benefactors, staff and colleagues. Support for this study was provided by the Francis Payne Bolton School of Nursing Alumni Association and Sigma Theta Tau Alpha Mu Chapter.
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CHAPTER I

Introduction

Health care requirements of the elderly are increased by preexisting chronic illnesses and functional limitations. Persons aged 65 and older have an average of four to five chronic illnesses (Collins cited by Brown, 1988) and one-fifth of noninstitutionalized elders are functionally impaired (Leon & Lair, 1990). The elderly are hospitalized at a rate that is nearly four times that of the general population and their length of hospital stays are longer (Brody, 1984). Of persons aged 65 or older, approximately 20% are hospitalized annually and over one-fourth of those admitted are rehospitalized during the following year (Brody). Many of the elderly who are hospitalized return to the community. The nursing care these elders receive during their hospitalization may contribute to their ability to care for themselves upon discharge (Rubenstein, Wieland, English, Josephson, Sayre & Abrass, 1984; Sloane, 1980).

The way staff are arranged or structured on nursing units determines the type of care that will be administered (Alexander, 1982). As unit structure increases, staff become focused on tasks (Alexander). When structure is decreased, staff approach patients on a case by case basis and focus on goals (Alexander).
In determining unit structure, nurse executives must match resources with the demands created by the nature of the work and requirements for increased productivity (Fine, 1983). To measure productivity, nurse executives must focus on patient outcomes (American Nurses’ Association, 1976; Joint Commission on Accreditation of Hospitals, 1975). An important outcome for elderly patients is functional health (Brown, 1988).

Creating nursing unit environments that optimize the functional health of hospitalized elderly has presented a new challenge to nurse executives. Critical questions raised by nurse executives facing these challenges are: (a) How should nursing departments be structured? and (b) Can units be structured in a manner that produces positive patient outcomes? (Henry, Moody, Pendergast, O’Donnell, Hutchinson, & Scully, 1987).

**Purpose**

This study represented pioneering efforts at measuring nursing unit work and structure in relation to patient outcomes. This study focused on nursing units found within acute care hospitals and included only those which discharged elders directly to their homes. Psychiatric and intensive care units were excluded. The purpose of this study was to describe the relationships
between the work and structure of nursing units as it related to the functional health of the elderly patients.

To accomplish this aim, a theoretical framework was developed by transforming Van de Ven and Ferry's (1980) task contingent model from King's (1981) perspective of nursing. From this perspective, work on a nursing unit refers to effort directed at improving the functional health of the unit's patients. The patients of interest in this study were elderly patients.
Model

The concepts in this study were work, structure, and functional health. As portrayed in Figure 1, work and structure were independent variables and functional health was the dependent variable. Measures of all three concepts reflected nursing units.

![Diagram showing the relationship between work, structure, and functional health](image)

**Figure 1.** The relationship between nursing unit work, structure, and functional health.
Significance

The number of hospitalized elderly and their consumption of hospital resources is increasing. Nurse executives, keeping the needs of the elderly patient and desires for optimal patient outcomes in mind, must decide how nursing units can best be structured. Unfortunately, no theory exists for helping nurse executives with these decisions.

The significance of this study lies in its contribution to theory development for nursing science and nursing administration. For nursing science, this study contributes to nursing practice theory development by testing a model that hypothesizes relationships between the interpersonal environment of hospital nursing units and functional health of patients. For nursing administration, the study represents a synthesis of management science and nursing science. As noted by Meleis and Jennings (1989, p. 9), "nurse managers are challenged not only to join knowledge of management with their nursing acumen, but to blend, transform and balance the two sources so as to keep nursing care the focus of their management."

Theoretical Framework

This section begins with definitions for theory and
practice theory. An explanation of how theories are shared between the two disciplines of nursing and management is then provided. These definitions illuminate the study’s contribution to nursing practice theory and differentiate this study from management research.

In this study, the framework for analyzing the relationships between work, structure, and outcome was provided by Van de Ven and Ferry’s (1980) task contingent model. The task contingent model was interpreted from a nursing perspective by applying King’s (1981) theory for nursing. Through this interpretation, functional health was identified as an appropriate outcome measure.

King’s (1981) theory will be presented in a manner that focuses on the concepts of person, nursing, health, and environment. The purpose of defining the preceding concepts and interrelationships is to identify the perspective used in interpreting the task contingent model.

Nature of Practice Theory

Theory, according to Stevens (1979, p. 1), "is a statement that purports to account for or characterize some phenomenon." Practice theory differs from a basic theory in that practice theory has a purpose and stresses change (Dickoff & James, 1968; Meleis, 1985). As clarified
by Meleis (1985, p. 100), "nurses may develop basic theories that describe discovered concepts, relationships related to human beings, nursing situations, nurse/patient interactions, environment or health; but the ultimate goal is to develop theories that change situations." To understand, explain, predict, and prescribe nursing phenomena, nurses need to develop practice theories (Meleis).

King's (1981) theory is descriptive and has yet to acquire the predictive qualities of practice theory. For King's theory to become a practice theory applicable to nursing units, the interpersonal environment needs to be further defined. In this study, the interpersonal environment was defined by Van de Ven and Ferry's (1980) task contingent model. Using this frame of reference, the relationship between the nursing unit work and structure and elderly patient functional health were explored.

Nature of Shared Theories

Theories are shared between disciplines as a result of the overlap between disciplines in terms of their content areas. As noted by Chinn and Jacobs (1987), disciplines may study the same phenomena but their goals or reasons for increasing their understanding of the phenomena will differ.
An example of a theory that is shared between disciplines is systems theory. According to Wren (1987), systems theory began with the notion of Gestalt that came into prominence in 1810 through the work of an Austrian, Christian von Ehrenfels. Gestalt psychology, "represents an organismic approach which emphasized not the parts or the units, but the patterns, wholes, configurations and so, which made the whole appear to be more that the sum or parts" (Wren, 1987, p. 171). The actual phrase "general systems theory" was not introduced until the 20th century and was then coined by biologist Ludwig von Bertalanffy (Wren). According to Wren, Bertalanffy "sought unity of sciences and believed that different disciplines had similarities that could develop into a general systems model" (p. 402).

Nursing and management science both use systems theory, but they approach it in different ways. From a nursing perspective, King (1981) used systems theory to describe the exchange and boundaries between person and environment in relation to health. Parsons (1951), a sociologist who presents one of the perspectives adopted by management science, used systems theory to describe the relationships between organizations and society as cooperative systems.

Nursing and management sciences also share an
interest in the environment. Nursing science differs from management science, however, in that nursing's interest in the environment is in relation to health. Nurses dating back to Florence Nightingale (1859) have recognized the importance of changing the environment to affect the health of patients. Henderson (1966), as did Nightingale, conceptualized the environment to focus on aspects of the patient's physical environment, such as sanitation. Researchers interested in the physical environment and patients' well-being, have studied a wide range of topics including space, unit design, sound, and color (Williams, 1988).

The nonphysical aspects of the environment are also of interest to nurses. King (1971), for example, expanded her concept of environment to include nonphysical aspects. According to King (1981), the environment is interpersonal in nature and may encompass health care organizations. For this study, the environment was conceptualized from King's perspective as the interpersonal environment of a hospital nursing unit.

**King's Theory for Nursing**

King's (1981) theory provides a description of the nature of the nurse-patient-environment-health interaction. For this study, King's descriptions of the
concepts nursing, person, health, and environment provided
the framework for:
1. viewing the nature of the patient from the perspective
of the nurse's perceptions;
2. indicating that the goal oriented actions of the nurse,
or work as defined by management science, are based upon
the nurse's perceptions of the patient;
3. indicating that the techniques applied to alter the
patient's condition are in response to and need to be
evaluated according to the patient's needs;
4. expanding the meaning of interpersonal environment to
encompass the structure or arrangement of nursing staff on
a unit;
5. defining functional health as an outcome of nursing
care;
6. using functional health as an outcome that measures the
quality of nursing care.

King's theory of nursing evolved from nursing
practice and describes interrelationships between the
concepts of person, health, nursing and environment. In
King's (1981) framework, person and environment are
described as open interacting systems. When the
interactions are not conducive to health, nursing
intervenes (King). Through the nursing process, nurses
interact with persons in a manner that promotes
restoration of the person's health.

King's (1981) concepts provided the foundation in this study for interpreting Van de Ven and Ferry's (1981) task contingent model from a nursing perspective. The following presentation highlights the contributions made by King's concepts. As will become evident, clarification of King's concepts was necessary for measurement of the environment. This clarification was provided by the task contingent model and other related literature.

Concept of Person

The person or patient described in King's (1981) theory is a dynamic open system. According to King, persons are rational, social, sentient, time-oriented, reacting, perceiving, controlling, purposeful, and action-oriented beings (p. 143). As open systems, they have permeable boundaries which permit exchange with the environment of matter, energy, and information (p. 69).

King's (1981) definition also defines persons as being environmentally influenced. The environment is interpersonal in nature and may incorporate others in the community or the staff on a nursing unit. Persons are conceptualized by King as interacting purposefully within their environment to enhance, maintain, or regain their functional ability. From this perspective, hospitalized patients in this study were assumed to have functional
health and discharge as goals. Hospitalized patients were also assumed to be influenced by their interactions with nursing unit staff.

**Concept of Health**

Health is defined by King (1981, p. 5) as "dynamic life experiences of a human being, which implies continuous adjustment to stressors in the internal and external environment through optimum use of one’s resources to achieve maximum potential for daily living." Instead of viewing health as existing on a continuum with illness, King envisioned "health as a functional state in the life cycle, and illness as indicating interference in the life cycle". From King’s perspective, health in this study was evaluated in terms of functional abilities.

**Concept of Nursing**

Nursing is defined by King (1981, p. 144), as "a process of human interactions between nurse and client whereby each perceives each other and the situation; and through communication, they set goals, explore means, and agree on means to achieve goals." The goal of nursing "is to help individuals maintain their health so that they can function in their roles" (King, pp. 4-5). As described by King, the nurse objectively assesses the functional abilities and disabilities of patients. The nurse then implements activities that serve to promote,
maintain or restore functional health.

King’s (1981) description of nursing outlines functional health as an outcome of nursing activities. Within the profession of nursing, "dedication to the achievement of an optimal functional status of patients is a basic premise" (Brown, 1988, p. 13). Based upon this premise, functional health served as the outcome variable for this study.

Assumptions being made in this study about functional health and nursing were: (a) by applying the nursing process, nurses can have a positive impact on functional health and (b) the number of goal directed activities a nurse will need to apply to enhance a patient’s functional health will increase in proportion to the magnitude of the patient’s needs.

The relationship between nursing activity and the environments is also important. Within King’s (1981) definition of nursing, no description is provided for explaining how nursing functions change in response to the environment. King, recognized, however, that the environment may influence a nurse’s ability to provide patient care.

Concept of Environment

The environment is defined by King (1981) as an open system. The environment’s permeable boundaries are the
factors which characterizes the relationship between the environment and person as being of an interacting nature. King's (p. 119) conceptualization of the environment encompasses organizational environments. Organizations are defined as systems, "composed of human beings with prescribed roles and positions who use resources to accomplish personal and organizational goals." Organizations such as hospitals are characterized by their structure, functions and goals. Structure, according to King "provides for an ordering of positions and activities" and identifies the functions of the organization (p. 116). King (1971) noted that the structure of an organization may influence a nurse's ability to provide patient care. Later, King (1981, p. 119) also realized that within the hospital, individuals and groups are structured to form subunits and that "there are many subunits that influence care of persons."

King's (1981) description of the environment and structure, does not address how unit structure affects nursing functions. King also does not describe how nursing units should be structured. However, other writers have done so. For this study, Alexander's (1982) work provided the description of how nursing functions vary in relation to structure. Additionally, Van de Ven and Ferry's (1981) task contingent model served as the
framework for describing how units should be structured.

Based upon his research on staff professionalism and his knowledge of the literature, Alexander (1982) identified two types of nursing units. As described by Alexander, the structure of nursing units ranges between two types. These alternative types of nursing units are task-centered and goal-centered units. A task-centered unit, as defined by Alexander, reflects a high degree of procedural standardization, specialization of task assignments and centralization of decision making. "This approach to patient care emphasizes aspects of care such as the highly technical specialized procedures associated with biomedical intervention" (p. 21). Such procedures are divisible into sub-tasks amenable to an industrial type of production effort. In a task-centered unit, "the RN will typically pass out medications, the LVN will administer treatments and the nurse aids give baths and take temperatures" (Alexander, p. 21).

The alternative type of unit, according to Alexander (1982), is a goal-centered unit. "A goal-centered unit is characterized by non-segmented task, broad staff decision making authority and flexible operating procedures. Staff members in goal-centered units are all concerned with a complete array of patient care tasks and approach patients on a case by case basis" (Alexander, p. 21).
The goal-centered unit described by Alexander (1982) is compatible with King's (1981) perspective of nursing. As described by King, functional health is enhanced by goal directed nursing care. Logic follows that the extent to which a unit would need to be goal directed would depend on the needs of the unit's patients. Missing from this discussion, at this point, is a framework for operationally relating a unit's patients needs with its structure. The task contingent model will now be presented to serve this purpose.

**Contingency Theory**

Contingency theories have played an important role in management science for more than two decades (Tosi & Slocum, 1984). The stage for development and subsequent widespread popularity of contingency theory was created by criticisms to bureaucratic management models. While bureaucratic models specified "one best way" of organizing and managing, contingency theories proposed that the appropriate organizational structure and management style were dependent upon a set of contingencies (Fry & Slocum, 1984, p. 9).

The contingency factors were originally conceptualized by Perrow (1967) as being dimensions of an organizational unit's technology. Perrow's definition of
technology is interchangeable with the term work, and refers to raw materials and the goal directed activities performed to alter those materials. Raw materials may be people symbols or things. Perrow characterized a unit's work in terms of its variability and difficulty, and proposed work, as the best basis upon which to compare organizational units.

Earlier researchers (Comstock & Scott, 1977; Leatt & Schneck, 1892a; Mohr, 1971), like Perrow sought to compare units based upon the characteristics of their work. At first, these researchers saw work as determining how a unit would be structured. This deterministic perspective was then gradually altered to take on a new focus. The new direction, as portrayed in Van de Ven & Ferry's (1980) task contingent model, hypothesizes productivity as being maximized when a unit is structured according to its work.

Van de Ven and Ferry's (1980) Task Contingent Model

According to Van de Ven and Ferry's (1980) task contingent model, a unit functions most effectively when it is structured according to its work. Within Van de Ven and Ferry's task contingent model, work is defined according to Perrow (1970) as having the dimensions of variability and difficulty. The manner in which variability and difficulty relate to structure was first
described by Van de Ven and Delbecq (1976) through their
development of taxonomy of unit structural modes. Within
their taxonomy, Van de Ven and Delbecq define task
variability as how a unit is actually structured and
difficulty as to the expertise needed to do the work.

Van de Ven and Delbecq (1976) researched the work
units of an employment security agency and found that the
taxonomy differentiated types of units. Van de Ven and
Delbecq provided support for the two dimensional
relationship between task variability and difficulty and
unit structure hypothesized by the taxonomy. The
findings, however, were not generalizable to other
organizations. Van de Ven and Delbecq had not
operationally defined structure in a fashion to make the
study replicable to other types of organizations.

To meet this need for measuring the work and
structure of other organizations, Van de Ven and Ferry
(1980) developed the Organizational Assessment Instruments
(OAI). The authors then used the OAI in their studies
and, through their findings, developed the task contingent
model. The model differs from the taxonomy in that it
specifies relationships between the dimensions of work and
structure in regard to unit performance. For this study,
Van de Ven and Ferry's model serves as a framework that is
then interpreted from a nursing perspective through King's
(1981) theory for nursing. Like any framework developed in another discipline, the task contingent model requires a few alterations to be made applicable to a nursing situation. Lamb (1990, p. 66) noted that "without careful scrutiny of the fit between nursing’s disciplinary perspective and borrowed theory, there can be no assurance that we are developing a coherent knowledge base for nursing practice." To be brought into alignment with the nursing perspective used in this study, the task contingent model will undergo the process Lamb calls transformation.

According to Lamb (1990), transformation of the task contingent model first requires that the model’s assumptions be evaluated for their compatibility with King’s (1981) perspective. As a model from the systems-structural view of management science, the assumptions in the task contingent model are as follows:

1. people make rational decisions,
2. organizations are objectively real and can be empirically studied,
3. research builds knowledge in increments,
4. behavior in organizations is determined by the missions and structure of the organizations,
5. actions can be evaluated as rational, effective, and efficient in fulfilling organizational missions
(Dienemann, 1989, p. 162).

The preceding assumptions were found to be compatible with King's (1981) perspective. Both perspectives conceptualize humans as rational beings who interact through roles with others. The interpersonal interaction in both perspectives is goal oriented and influenced by the environment.

After the assumptions of the task contingent model were analyzed, King's (1981) perspective was used to review the concepts and propositions. As noted by Lamb (1990), concepts and propositions must be evaluated for needed changes. The concepts of tasks and productivity within the task contingent model were found to need clarification. The term task needed to be focused on nursing activities aimed at meeting patient needs. The concept of productivity needed to be operationalized in terms of functional health.

According to the task contingent model, as transformed from King's (1981) perspective, a nursing unit should be structured according to the nature of its work (Perrow, 1967; Van de Ven & Delbecq, 1974). The task contingent model further explains that when a unit's structure appropriately fits its work, the unit's productivity will be enhanced (Van de Ven & Delbecq). To define the fit between work and structure, the task
contingent model begins by defining work and structure as multidimensional concepts. Next, the task contingent model reduces the concepts of work and structure to their dimensions. Finally, the model proposes relationships between specific dimensions of work in terms of specific dimensions of structure. The task contingent model does not yet provide calculations for combining dimensional measures in a manner that would portray an aggregated measure for work or structure. Instead, relationships are proposed which match specific dimensions of work to specific dimensions of structure.

Within the task contingent model, work is a two dimensional concept containing the dimensions of variability and difficulty (Perrow, 1967; Van de Ven & Delbecq, 1974). The dimension of variability refers to the characteristics of the work (Perrow). Variability also refers to the degree to which the work is unfamiliar or nonrepetitive (Van de Ven & Delbecq). On a nursing unit, variability is the degree to which a unit's patients differ in their needs. Nursing units with high variability have patients who have different needs. These needs may be easily analyzed by the staff or they may be complex and difficult for the staff to assess and resolve. The dimension of work referred to as difficulty is encountered by a nursing staff when a unit's patient needs
are vague and the appropriate interventions are not easily identifiable. A nursing unit could be low in variability in that the unit's patients all share similar needs, yet high in difficulty in that the needs are not easily analyzed. According to the task contingent model, both dimensions of work—difficulty and variability—need to be considered in establishing a unit's structure (Van de Ven & Delbecq).

Within the task contingent model, structure refers to the formal arrangement of staff on a nursing unit (Van de Ven & Ferry, 1981). Structure is defined as a three-dimensional concept in the task contingent model. The dimensions of structure are standardization, specialization, and distribution of authority (Van de Ven & Ferry). Standardization refers to the extent to which rules, standards, operating procedures, and performance expectations are specified (Van de Ven & Ferry). Specialization refers to the degree of functional differentiations among unit personnel (Van de Ven & Ferry). Distribution of authority is defined as the locus of decision making within a unit (Van de Ven & Ferry).

As previously presented, the task contingent model specifies relationships between specific dimensions of work and specific dimensions of structure. As diagrammed in Figure 2, relationships are proposed between
variability and specialization; variability and standardization; and between difficulty and distribution of authority to staff (Van de Ven & Ferry, 1981).

Figure 2. The relationships between the dimensions of nursing unit work and structure in relation to functional health.
According to the task contingent model, variability determines how tasks can best be performed (Van de Ven & Ferry, 1981). Variability determines the extent to which patient needs can be met with standardized approaches (Van de Ven & Ferry). Variability also determines the extent to which staff roles can be specialized to specific tasks (Van de Ven & Ferry).

Difficulty, the other dimension of work, affects the distribution of authority. As defined by the task contingent model, difficulty increases the amount of authority needed by the staff to make decisions. When the patients on a nursing unit have needs that are difficult to analyze, the intervention needed to improve their health cannot be predetermined. The nursing staff will therefore need the authority to determine how best to apply their expertise in meeting the needs of the patients.

As specified previously, the task contingent model does not provide a formula for aggregating measures of difficulty and variability into a single measure of work. The model also lacks a means of combining the structural dimensions. The model, for example, proposes a relationship between difficulty and distribution of authority. Logic follows that distribution of authority to staff in making decisions is indirectly related to
standardization.

To further develop the task contingent model, testing of the indirect relationships between the dimensions of work and structure is needed. Research is first needed, however, to determine if support can be found for the relationships currently hypothesized by the model.

Research Questions

The task contingent model as transformed from King’s (1981) perspective served as the foundation for the following research questions:

1. What is the relationship between nursing unit work and structure?
   a. On nursing units, what is the relationship between the variability of the work, the standardization of the tasks, and the specialization of roles?
   b. On nursing units, what is the relationship between the difficulty of the work and the distribution of authority to staff nurses?

2. Is there a relationship between the work and structural characteristics of nursing units and the functional health of the units’ elderly patients?
   a. On nursing units, what are the relationships
between the variability of the work, the standardization of tasks, the specialization of roles, and the functional health of the units' elderly patients?

b. On nursing units, what is the relationship between the difficulty of the work, the distribution of authority to nursing staff, and the functional health of the units' elderly patients?

Definition of Terms

The variables found in the preceding research questions are defined as follows.

Work - The effort directed at effecting a positive change in the health status of human beings. On a nursing unit, work is defined by the patients' needs and associated tasks.

Work is a two dimensional concept. The dimensions of work according to Van de Ven and Ferry (1981) are variability and difficulty. Van de Ven and Ferry have developed subscales in the Organizational Assessment Instruments (OAI) for measuring variability and difficulty according to the following definitions:

Variability - The degree to which work is familiar or repetitive.
Difficulty - The degree of complexity of the thought process involved in identifying patient needs and outcomes.

Structure - The formal arrangement of unit personnel within a hospital. Structure is a multidimensional concept that contains the dimensions of standardization, specialization, and distribution of authority (Van de Ven & Ferry, 1980). The dimensions of structure identified by Van de Ven and Ferry and incorporated into three OAI subscales are defined as follows:

Standardization - The extent to which unit rules, standards, operating procedures, and performance expectations are specified.

Specialization - The degree of functional differentiation among unit personnel.

Distribution of authority - The locus of decision making within a unit.

Functional health - "The extent of capacity to do those tasks needed for continued independent living in the community" (Fillenbaum, 1988, p. 10). According to Spector, Katz, Murphy, and Fulton (1987), there are two categories of activities which describe the functional ability of elders: Activities of Daily Living (ADL) and Instrumental Activities Of Daily Living (IADL). "ADL functions represent activities that are essential for
self-care (e.g. bathing, dressing, feeding). IADL functions represent activities that are necessary to adapt independently to the environment (e.g. shopping, transportation, housekeeping)" (Spector, Katz, Murphy & Fulton, p. 381). For this study, functional health was measured in terms of capacity to perform both ADL and IADL. To obtain such information from patients, the researcher will use the ADL section of the OARS Multidimensional Functional Assessment Questionnaire.

**Nursing unit** - The geographic inpatient area of a hospital.

**Tasks** - The activity performed in response to meeting a patient’s health care needs.

**Role** - The position formally assigned according to a work assignment.

**Summary**

Creating environments that optimize the functional health of hospitalized elderly has created new challenges for nurse executives. Research is now needed to describe for nursing units the relationships between work, structure, and functional health. Without such research, the knowledge needed to develop practice theory cannot be obtained. Without practice theories to help them, nurse executives are left without the resources needed to make
effective decisions about the structure of their nursing units.

Chapter I has outlined Van de Ven and Ferry's (1981) task contingent model from King's (1981) perspective of nursing. For this framework to become applicable to practice for nurse executives, research is needed to determine the relationships between the work and structural characteristics of nursing units and the functional health of their elderly patients.
CHAPTER II

Review of Literature

The purpose of this study was to examine the relationships between nursing unit work, structure, and elderly patient functional health. The theoretical framework applied was Van de Ven and Ferry's (1981) task contingent model transformed from King's (1981) perspective of nursing. Within this framework, as presented in chapter one, the concepts of work and structure are reduced to their dimensions. Complex relationships are then hypothesized between each dimension of work in reference to specific dimensions of structure.

Ideally, the review of literature which follows would be organized around the dimensions of work and structure and their relationships to functional health. Such a review, for example, would present studies that focused on the relationships between work difficulty and staff decision making authority in relation to functional health. The research needed for such a review, however, is not yet available. As previously presented, this study represents pioneering efforts at measuring nursing unit work and structure in relation to functional health.

Prior research on unit structure has not studied structure from a patient need or outcome perspective.
Instead, structure, either on an organizational or unit level, has been related to variables such as technology, organizational size, and environment (Blau, 1970; Burns & Stalker, 1961; Child & Mansfield, 1972; Fry & Slocum, 1984; Hage & Aiken, 1969; Hall, 1962; Leatt & Schneck, 1982; Schoonhoven, 1980; Woodward, 1965). Analysis of the findings from prior research is further complicated because researchers defined work and structure differently. For this reason, the following review emphasizes how the researchers defined their concepts. As noted by Fry (1982), variations in findings may have occurred because researchers used different conceptualizations of work and structure, levels of analysis, and types of measures.

The review that follows begins with information on the concept of structure followed by literature on the concept of work. The purpose of this overview is to provide a foundation for the critique of the studies which follows. This presentation of studies begins with those that have explored the relationship between unit work and structure. The studies that relate the interrelationship of work and structure to performance follow. Finally, studies are presented which describe functional health as an outcome variable.
Structure

From King's (1981), perspective of the environment, the structure of a nursing unit contributes to the functional health of the unit's patients. Structure from this perspective is an aspect of the interpersonal rather than the physical environment. In this context, structure refers to the arrangement of people in an organization (Aiken & Hage, 1968; Hunt, 1970; King; Thompson, 1967).

Dimensions of structure.

Like other complex concepts, structure has more than one dimension and the manner in which these dimensions are labeled differs among authors. Review of the literature, however, reveals that the various dimensions listed for structure share many similar conceptual definitions. All of the studies reviewed incorporated a dimension of structure that specified the locus of decision making authority (Aiken & Hage, 1968; Alexander, 1982; Alexander & Randolph, 1985; Brass, 1981; Calkin, 1980; Comstock & Scott, 1977; Dewar & Hage, 1978; Di Angi, 1989; Fry, 1982; Hage & Aiken, 1967; Harvey, 1968; Pugh & Hickson, Hinings & Turner, 1968; Van de Ven & Ferry, 1980). The studies, with the exception of Alexander's (1982) first study, also included a second structural dimension to identify the extent to which operational standards were in place. All of the studies except Calkin's, also included a third
dimension of structure, functional differentiation of personnel. For this study, these three dimensions of structure will be labeled according to Van de Ven and Ferry as: (a) distribution of authority, (b) standardization, and (c) specialization.

Some of the variation among researchers in their approach to structure can be attributed to the level of organizational analysis applied. Researchers that focus on the organization as a whole generally assume that the work and structural forms of an organization's subunits are homogenous (Fry, 1982). Research has shown, however, that the structure of subunits of complex organizations, such as hospitals, can differ (Alexander, 1982; Comstock & Scott, 1977).

In a study of eight nursing units by Kovner (1966, cited in Alexander, 1982), differences between units were found in terms of supervisory structure and task discretion. In another study of 148 units from 17 hospitals, Alexander found that unit structure varied within and among hospitals. This study's findings provide support for anticipating structural differences among nursing units.

Work

In addition to unit structural differences, research has shown that nursing units differ in terms of their work
(Overton, Schneck, & Hazlett, 1977). For this study, work refers to effort directed at achieving a positive change in the health status of human beings. The concept of work is used interchangeably with the concept of technology within the management literature and in this study.

Technology, according to Perrow (1965, p. 195), is "the actions that an individual performs upon an object, with or without the aid of tools or mechanical devices, in order to make some change in that object." Perrow defines the object or materials as being people, symbols, or things. Like the concept of work, technology, as defined by Perrow, specifies an action directed at effecting change in someone or something. By including people as potential objects, Perrow's conception of technology differs from Webster's (1986) version. According to Webster, the objects of technology are materials.

Through discussion of the meaning of technology with staff nurses, the researcher found that the nurses shared Webster's view. A consistent interpretation by the staff nurses was that technology referred to "equipment" and "monitors". The concept of work, however, was interpreted to mean "patient care". Based upon these interpretations, the researcher decided to use the term work versus technology. In the review that follows, the term work will be applied, and is intended to be
equivalent to, Perrow's concept of technology.

From Perrow's (1970) perspective, work varies in its degree of routine or lack of routine and in the nature of the thought process applied by the individual performing the work. Work is routine when "there are well established techniques which are sure to work and these are applied to essentially similar materials" (p. 75). A situation lacking routine occurs when the materials are not standardized and "there is little certainty about methods and whether or not they will work" (Perrow, p. 73). The nature of the thought process involved with work "depends upon what is known about the material one is to transform" (Perrow, 1979, p. 76). If a great deal of information is known, the material is analyzed without difficulty.

According to Perrow (1970), work can be operationalized by analyzing tasks or materials. Either approach is correct because of the stimulus response set that occurs between the materials and their associated tasks. The perspective taken by some researchers has been to operationalize work in terms of tasks (Comstock & Scott, 1977; Hage & Aiken, 1969; Hrebinak, 1974; Lynch, 1974; Woodward, 1965). The perspective taken by this study was to operationalize work by analyzing the "materials" in terms of patient needs. This perspective
is taken because the outcome of interest was the functional health of patients versus the number of tasks or procedures completed.

Dimensions of work.

According to Perrow (1970), work has two dimensions: variability and difficulty. Researchers such as Lynch (1974) and Overton, Schneck, and Hazlett (1977), have applied factor analysis to their measures of work to validate the presence of these dimensions.

Lynch (1974) factor analyzed her measure of work taken per questionnaire for 15 library departments. Within the findings, Lynch discovered a factor that combined items for routineness of operations, predictability, and insufficient knowledge. This factor was labeled as technology and was interpreted as providing support for Perrow’s (1970) technological construct. Lynch also found that items for rule discretion and task interdependence separated into an additional factor. This finding indicated that rule discretion and task interdependence were components of structure and that structure could be differentiated from technology.

Overton, Schneck, and Hazlett (1977) also sought to empirically specify the dimensions of technology. In their questionnaire, technology encompassed: (a) raw materials in terms of their uncertainty, instability and
variability; (b) techniques in terms of the mechanisms used to handle exceptional cases; and (c) task interdependence.

Overton, Schneck and Hazlett (1977) administered their questionnaire to 329 staff nurses randomly selected from 71 Canadian hospital nursing units. A factor analysis was performed on the nurses' responses and three factors were identified. The three dimensions of technology that were originally hypothesized by Overton, Schneck, and Hazelett (raw materials, techniques and task interdependence), did not appear as separate factors. The authors did, however, identify three factors and labeled them as: (a) uncertainty, (b) instability, and (c) variability. Unlike Lynch (1974), Overton, Schneck and Hazelett found task interdependence integrated into each of their three factors. As previously presented, Lynch's findings supported the differentiation of task interdependence as a component of structure.

In addition to their factor analysis, Overton, Schneck, and Hazelett (1977) sought to differentiate nursing units according to their uncertainty, instability, and variability. Unit scores for each of the preceding factors were thereby obtained by calculating a mean for the five nurse responses from each unit. Analysis of the data revealed that the seven types of units (auxiliary,
psychiatric, rehabilitation, obstetrics, pediatric, surgical, and intensive care) differed (alpha=0.05) on all three factors (Overton, Schneck, & Hazelett).

In their findings Overton, Schneck, and Hazelett (1977) also discovered that the auxiliary units which cared for chronically ill and aged patients scored relatively high in uncertainty. This finding was unexpected by the authors because they originally thought that auxiliary units were routine. This finding is consistent, however, with current thoughts which regard care needs of the aged as complex (Brown, 1988).

Overton, Schneck, and Hazelett's (1977) measure of technology was later replicated on a sample of 157 nursing units by Leatt and Schneck (1981). The nursing units represented the nine types of units found in 24 Canadian hospitals. Like Overton, Schneck, and Hazelett, Leatt and Schneck found that the nine types of nursing units differed in their uncertainty, instability, and variability.

For this study, the preceding findings provide two means of support. First, support was provided for analyzing the hospital environment and patients at the unit versus the organizational level of analysis. Second, support was provided for measuring the work of nursing units in terms of patient needs (Overton, Schneck, and
Hazelett, 1977).

Prior research on work also raises questions about the conceptual dimensions of work that are being used in this study. According to Perrow (1970), work has the dimensions of difficulty and variability. Overton, Schneck, and Hazelett’s (1977) measure changed Perrow’s dimension of difficulty into two dimensions, uncertainty and instability. Unlike other researchers (Alexander, 1982; Comstock & Scott, 1977; Lynch, 1974), Overton, Schneck, and Hazelett also incorporated task interdependence into the concept of technology.

The research to be presented next in this review will provide more information about the dimensions of work while describing relationships between work and structure. Support will be provided with this information for the conceptual definitions and framework used in this study. For this study, Van de Ven and Ferry’s (1980) task contingent model provided the framework for describing the relationships between work and structure. Perrow’s (1970) definition of work was applied within this framework.

**Relationships Between Work and Structure**

Earlier studies on the relationship between work and structure were often performed on an organizational level of analysis (Hage & Aiken, 1969; Harvey, 1968; Hickson,
Pugh & Pheysey, 1969; Woodward, 1965). Based on the assumption that the units were homogenous, measures of work were taken at the organizational level as an average across units (Fry, 1982). As presented through Overton, Schneck, and Hazelett’s (1977) research, however, the assumption of unit homogeneity was not supported in reference to nursing units.

The studies to be presented next in this review were enhanced by their focus on units versus organizations. Problems exist, however, in comparing findings across studies because the unit-level studies, like the organizational studies, differed in their conceptualization of work and structure. To compensate for this problem, the presentation of each study will include each study’s conceptual definitions. The concept of work will continue being used interchangeably with the concept of technology.

One of the earlier studies on the relationship between technology and structure was conducted by Mohr (1971). Using 144 randomly selected health department work groups, Mohr measured work in terms of manageability. Structure was then measured in terms of staff participation in decision making. The author found only a weak correlation ($r = -0.18$) between the manageability of the technology and the participativeness found in the
structure of the groups.

Mohr’s (1971) study limited the definition of technology to include only the dimension of manageability. Manageability as defined by Mohr resembles Perrow’s (1970) dimension of technology labeled as difficulty. Unlike Mohr, Perrow also included in technology the dimension of variability. Mohr (p. 448) also noted that the variance in technology among the work group sample "was not as great one would have liked to have had in order to test the hypothesis." Had Mohr expanded his concept of technology to include Perrow’s dimension of variability, he may have increased his ability to detect a greater range of technological differences among work groups.

In a later study, Comstock and Scott (1977) sought to differentiate the effects that task and work flow predictability had on the characteristics of nursing unit structure and staff. As defined by Comstock and Scott, task predictability resembled the dimension of technology referred to by Perrow (1970) as difficulty. Task predictability for Comstock and Scott’s 142 nursing units was measured in terms of the predictability of the tasks associated with patients who had particular types of surgical operations. An estimate of work flow predictability was then assigned by the authors based on
their estimates of the variety of tasks found in each type of nursing unit. Based upon their estimates, Comstock and Scott ranked the nursing units according to their work flow predictability. A score of one was assigned to intensive care units to represent them as having the greatest variability. A score of eight was assigned to mental health units to portray them as having the least variability.

Other measures obtained by Comstock and Scott (1977) were measures of unit structure. These measures included an index of staff differentiation and measures of the staff qualifications, standardization of procedures, and centralization of decision making. To analyze the data obtained from the preceding measures, the authors performed multiple regressions. From this analysis, it was found that predictable tasks reduced the qualifications of staff in terms of their level of training and professional activities. There was also an increase in differentiation indicating greater staff specialization (p<0.01 for both relationships). For centralization of routine decision making, Comstock and Scott (1977) found task predictability to be negatively related and work flow predictability to be positively related (p<.10).

When appraised from the perspective of Van de Ven and
Ferry’s (1980) task contingent model, Comstock and Scott’s (1977) findings have similarities and differences. Similar to the relationships described in the task contingent model, Comstock and Scott found that task predictability decreased the distribution of authority to staff. Unlike the task contingent model, Comstock and Scott hypothesized a relationship between specialization of staff roles and work difficulty. According to Van de Ven and Ferry’s task contingent model, work variability, rather than work difficulty relates to the staff specialization.

Another critical issue for Comstock and Scott (1977) was their measure of work flow variability. As they noted, their measure was crude. The reliability and validity of the method Comstock and Scott used in ranking units according to work flow variability was not discussed. The authors did, however, note that their findings may have been affected by their measurement of work flow variability.

In a later study, Leatt and Schneck (1982a, 1982b) sought to explore the relationship between nursing unit technology, size, environment, and structure. The purpose of this study was to describe similarities and differences between nine different types of nursing units (intensive, medical, surgical, psychiatric, auxiliary, rehabilitation,
rural, pediatric, and obstetrical). To measure their variables, Leatt and Schneck (1982a) designed a questionnaire to measure: (a) technology in terms of uncertainty, instability, and variability; (b) structure in terms of the types of positions within each unit, the formalization of roles, and the degree of decentralization of decision making; (c) size in terms of the number of beds per unit; (d) immediate environment in terms of unit perceptions of their interactions with other hospital groups, units, or departments; and (e) the contextual environment in terms of the characteristics of the hospital in which the unit operated. A table in Appendix A summarizes these variables in relation to those used in other studies.

Data for Leatt and Schneck’s (1982a) study was obtained by administering the questionnaire to the head nurses and nursing staff of 157 units that were located in 24 different Canadian hospitals. For their sample of nursing units, the authors found positive relationships (p<0.01) between measures of instability and uncertainty and the units’ ratio of registered nurses. A positive relationship (p<0.01) was also found between variability and the clerical ratio. The clerical ratio was used to reflect complexity in terms of the units’ needs for information and communication. Another finding by Leatt
and Schneck was a negative relationship (p<0.01) between measures of instability and uncertainty and decentralization from physicians. Decentralization from head nurses, however, was found to be positively related to uncertainty. As for the relationship between uncertainty and formalization, Leatt and Schneck found a negative relationship.

In reference to the relationships between structure and environment, Leatt and Schneck (1982a) found a positive relationship (p<0.01) between clerical ratio and the number of beds and the characteristics of the hospital. A negative (p>0.01) relationship between unit size and ratio of registered nurse positions to other staff positions was found (Leatt & Schneck).

In reference to the similarities and differences in the work environments of the nine types of nursing units, Leatt and Schneck (1982b) found units to be similar in their degree of autonomy from both physicians and administration, and to be similar in terms of their contextual environments. The units differed (p<0.01), however, in terms of the number and heterogeneity of external groups or departments with which they interacted.

Before Leatt and Schneck's (1982a, 1982b) findings can be appraised in relation to this study, their definitions and measurement of work and structure must be
understood. For the concept of structure, Leatt and Schneck (1982a) identified three dimensions: formalization, complexity, and types of positions and decentralization of decision making. Their multiple measures for each structural dimension, however, did not consistently relate to other measures designed to measure the same dimension. For example, the two measures for formalization that were supposed to measure role definition and role specificity were found to be unrelated (Leatt & Schneck, 1982a).

As for the measurement of technology, unlike Perrow (1967) whose conceptualization of technology is limited to the two dimensions of variability and uncertainty, Leatt and Schneck (1982a) expanded their conceptualization of technology to include a third dimension of instability. Their findings, however, did not differentiate instability as relating to any structural variable in a manner not also related to by uncertainty.

Unlike Leatt and Schneck, Van de Ven and Ferry (1980) conceptualized technology in terms of task variability and difficulty. Like Perrow (1970), Van de Ven and Ferry's dimension of difficulty refers to the analyzability and predictability of the work. From this perspective, instability is incorporated into the technological dimension of difficulty and is not a separate dimension.
As presented in chapter one, Van de Ven and Ferry’s (1980) task contingent model hypothesizes relationships between the dimensions of work difficulty and variability and the dimensions of structure. While identifying the nature of these relationships, Van de Ven and Delbecq (1974) developed a taxonomy of work unit organizational modes. Figure 3 describes this taxonomy and is provided to assist the reader in understanding Van de Ven and Delbecq’s study. This figure portrays work units two dimensionally. As diagrammed, the dimension of variability affects the extent to which unit activities can be structured. Difficulty affects the amount of expertise needed (Van de Ven & Delbecq).

According to Van de Ven and Ferry (1980), the three basic structural modes (systematized, service, and group) differed in terms of the dimensions of structure. Within the modes, additional variation exists depending on the difficulty of the work. Within the systematized mode, for example, greater difficulty requires a higher level of personnel training and expertise (Van de Ven & Delbecq, 1974). Van de Ven and Delbecq also noted that the structural distinctions between modes are distinctions between kinds of structures, while those within modes are distinctions of degree (p. 185).

To test the ability of the taxonomy to discriminate
among units, Van de Ven and Delbecq (1974) collected data on 120 work units within a large governmental employment

Figure 3. Taxonomy: Task-Contingent Model of Work-Unit Structure (Van de Ven & Delbecq, 1974, p.186)

security agency. Then, based upon the units' performance programs and civil service job classifications, they classified the units into the cells of the taxonomy. The authors randomly sampled the units and then compared the units in terms of their task difficulty and variability.

Van de Ven and Delbecq (1974) found that all cells or types of units within the taxonomy were represented within the agency that was sampled. However, for random sampling, sufficient numbers of units per type of unit or cell were only present for six of the cells: (a) routine system, (b) technical system, (c) routine service, (d) technical service, (e) intensive service, and (f) design group. The two cells representing specialist systems units and developmental group units existed within the agency, but lacked a sufficient number of units for random sampling and were therefore excluded (Van de Ven & Delbecq, 1974).

Van de Ven and Delbecq (1974) administered a questionnaire that contained seven items for each technological dimension to measure task difficulty and variability for each unit. Using coefficient alpha, the internal consistency of the task difficulty index was determined to be 0.86 with a task variability index of 0.89.

Unit scores for task difficulty and variability were
averaged from the questionnaire responses and the difference between the six types of units were compared (Van de Ven & Delbecq, 1974). The findings from pairwise comparisons between cells on task difficulty were significant (p<0.01) except for the difference between routine system and routine service units, technical system and technical service units and between intensive service and design group units. On task variability, significant (p<0.01) differences were found in all pairwise comparisons except for the comparisons made between: technical system and routine service units, technical and intensive service units, and between intensive service and design group units (Van de Ven & Delbecq).

According to the taxonomy as hypothesized, differences in task difficulty would be reflected in the varying levels of task expertise associated with routine, technical, and intensive differentiation (Van de Ven & Delbecq, 1974). Differences in unit variability would then exist in reference to unit structure as reflected in the three modes of system, service, and group. With the preceding in mind, the nonsignificant differences in task difficulty between routine and technical, system and service units were as hypothesized. The nonsignificant difference in variability between technical and intensive service units was also as hypothesized.
Van de Ven and Delbecq's (1974) taxonomy clarified the relationship between the two dimensions of work (variability and difficulty) and unit structure. Unlike prior research, Van de Ven and Delbecq depicted how variability and difficulty each relate to different aspects of unit structure.

To be of further use in studying unit work and structural differences, the taxonomy would have needed to define measures of unit structure in a manner that differentiated units within the cells of the taxonomy. Structure was not operationally defined in Van de Ven and Delbecq's (1974) study. Structure in their study was assigned to units and was not measured in terms of degree of standardization, distribution of authority, or specialization. Actual measurement of structure, preferably at the interval level, was needed to apply the taxonomy to other types of organizations.

Another issue of Van de Ven and Delbecq's (1974) study was its lack of investigation of unit performance. As noted by Dickoff and James (1968), for research to contribute to the development nursing practice theory it needs to have a purpose and an ability to effect change in a nursing situation. To meet such standards, the previously presented research needs to clarify the operationalization of structure and established a link
between unit work, structure, and outcomes.

In the next section of this review, the studies that have focused on the relationships between unit work, structure, and performance will be critiqued. Like other investigations on work and structure, the studies to be presented differ in their conceptual definitions. To compensate for this problem, the presentation of each study will identify the definitions used in that study. Because this study's aim is to contribute to the development of nursing practice theory, much effort is vested in clarification of the concepts used by other researchers. As stated by Jacobs and Huether (1978, p. 477), "the uniqueness of perceptual experience requires that concepts utilized in theory be carefully explicated."

Relationship Between Work, Structure and Performance

Van de Ven and Ferry (1980) designed the organizational assessment instruments (OAI) to measure the work, structure, and performance of organizational subunits. The OAI are based on the task contingent model and evolved from Van de Ven and Delbecq's (1974) earlier research with the taxonomy of unit structures. As previously presented, a deficit of Van de Ven and Delbecq's study was the lack of empirical measurement of unit structure. While Van de Ven and Delbecq's measures of technology were at the interval level, their
of unit structure was crude in the sense that unit structure was simply assigned on the basis of unit performance programs and staff job classifications.

Development of the OAI to provide measurement of unit structure as well as technology and process progressed over seven years through three revisions. The presentation that follows is in reference to the third or 1975 version of the OAI.

Within the OAI, unit structure or personnel arrangements are differentiated in terms of their specialization, standardization, and distribution of authority (Van de Ven & Ferry, 1980). As defined by the authors, specialization is the degree of functional differentiation among personnel in terms of role interchangeability, skill heterogeneity, and expertise. Standardization, the second dimension, refers to the extent to which rules, standards, operating procedures, and performance expectations are specified. The third dimension of structure, distribution of authority, refers to the locus of decision making authority regarding rules, policies, procedures, performance criteria and appraisals. The authors further differentiate authority in terms of supervisor, employee, group, and external authority.

For the concept of work, the OAI focuses on the dimensions of task difficulty and variability (Van de Ven
Task difficulty refers to the analyzability and predictability of the work while task variability focuses on the perceived variation of the incoming work.

Two different Organizational Assessment Instruments, one for supervisors and one for unit staff, were administered by Van de Ven and Ferry (1980) to the personnel of four different types of employment security agency units (n= 334 units). Factor analysis of individual questionnaire responses revealed 12 factors accounting for 71% of the total common variance. For the dimensions of structure and technology, factors were identified for task variability, standardization, supervisor discretion, and employee discretion (Van de Ven & Ferry). Factors were not identified for task difficulty and unit specialization and these indexes were determined to be in need of revision. The remaining factors, such as communication and job dependence, were identified as relating to unit process.

To analyze differences between units in reference to the identified factors and performance, Van de Ven and Ferry (1980) calculated unit scores by assigning equal weights to the unit supervisor and unit member questionnaires. Comparison of unit scores revealed that the task, structure, and process dimension detected
significant differences between the designated different types of units. As for the comparison of unit performance, the four types of units identified differed in the criteria used to measure efficiency and effectiveness, and were, therefore, not comparable. The units within each of the four types were analyzed, however, and each of the OAI factors was found to be significantly associated with the efficiency, effectiveness, and job satisfaction of at least one of the four types of units (Van de Ven & Ferry).

Based upon the preceding findings, Van de Ven and Ferry (1980) have revised the OAI and generated hypotheses concerning the fit between specific dimensions of unit structure and work and the relationship of this fit to unit performance. For the hypotheses to be made applicable to the development of nursing practice theory, however, requires that technology and unit performance be redefined from a nursing perspective. Research using patient samples and hospital settings is then needed to test the hypotheses.

Calkin (1980) recognized the need for research in a clinical setting and replicated parts of an acute care hospital’s diabetic clinic to create an experimental unit. A sample of 32 registered nurses were then assigned by Calkin to one of four experimental conditions: (a) routine
task/low structure, (b) routine task/high structure, (c) non-routine task/low structure, and (d) non-routine task/high structure.

Within the four conditions, structural differences in terms of centralization and formalization were created by Calkin (1980) by varying the role descriptions and scripts for the confederate charge nurses, physicians, and clerks. Structural complexity in terms of staff educational participation was held constant across all four conditions.

The two variations in task, routine and non-routine, were in reference to the outpatient care of diabetic patients. Routine was defined by Calkin (1980, p. 57) as "diabetic patient care tasks that are judged a priori by nurse judges to be low in difficulty of performance and in variability from patient to patient." Non-routine conditions then were created by changing patient scripts to reflect high difficulty and high variability.

Calkin (1980) measured staff nurse job satisfaction and performance for an indication of unit effectiveness. To measure performance, Calkin had judges use checklists and rating scales to evaluate the accuracy and adequacy of staff nurse task completion. During the experiment, Calkin's subjects in the low structure condition unexpectedly changed their assignments. The subjects
decided that their assignments were boring and inequitable and, without consulting the researcher, they changed their assignments in a manner that created a new task condition. In analyzing the data, Calkin excluded the five pairs of nurses who did not perform their tasks as assigned.

Within the remaining sample, Calkin (1980) found a low level of satisfaction in the routine task/high structure condition. Calkin found that nurses performing routine tasks in low structured conditions had the lowest performance scores, while those in the high structured conditions had the highest performance scores. For nonroutine tasks, Calkin found no difference between low and high structured conditions.

Calkin (1980) discovered while debriefing subjects that the unfamiliar clinical setting had created anxiety for participants and that the effects of formalization may have been in relation to anxiety reduction. As noted by the author, anxiety may have also influenced the subjects’ performance scores. Calkin’s study did not measure subject anxiety which left the extent of its influence unknown.

To test the hypothesis that the congruence between technology and structure is a better predictor of performance than technology, structure, or technology and structure, Alexander and Randolph (1985) collected field
data from 27 nursing units in three southeastern urban hospitals. Within their sample of units, the authors included medical-surgical, emergency, nursery, postpartum, labor and delivery, pediatric, and intensive care units.

In measuring technology, Alexander and Randolph (1985) applied an instrument developed by Leatt and Schneck (1981). Within this instrument, technology is conceptualized across three dimensions: uncertainty, instability, and variability. To obtain a measure of technological routines for each unit, Alexander and Randolph summed instrument responses across all three dimensions and then calculated an average of the scores for each unit. The authors also calculated unit scores for each dimension.

To measure unit structure, Alexander and Randolph (1985) used Leifer and Huber’s questionnaire. Unlike this study’s approach to structure, Leifer and Huber’s questionnaire limits the concept of structure to decision making authority and formalization (Alexander & Randolph). Structure is conceptualized within the questionnaire in terms of: vertical participation, horizontal participation, and formalization. The questionnaire responses were summarized by calculating means (Alexander and Randolph).

The performance measure applied by Alexander and
Randolph (1985) was the quality of nursing care as assessed on each unit using the Rush-Medicus Nursing Process Monitoring Methodology. This method evaluates patient care by collecting data from patient records, interviews with patients and staff, observations of patients, and inferences from observations. The authors used this methodology to collect data on 340 patients in the 27 units and to calculate performance scores for each unit.

Alexander and Randolph (1985) analyzed the data collected by performing analysis of variance on their measures of technology and structure. As anticipated, greater variance in unit technology scores was found between units than within units. For the measures of structure, however, no significance was found in the variance between and among units. The preceding findings gave support for aggregation of technology data by subunit but raised questions about the aggregation of the data on structure.

Alexander and Randolph (1985) proceeded to perform hierarchical regression for performance on technology and structure using three fit variables while considering the preceding findings. The calculation of the fit variables was done by subtracting a score representing a dimension of structure from a score representing a dimension of
technology. Scores were thereby calculated for the fit between: (a) instability and vertical participation, (b) variability and horizontal participation, and (3) uncertainty and formalization.

From the first phase of the regression, Alexander and Randolph (1985) found that the technology dimensions taken alone made a significant (p<0.01) contribution to the quality of care. The structure dimensions, however, were not found to be a significant predictor of quality of care. It was noted that this finding may have been influenced by the lack of variance in unit scores for structure.

The second phase of the regression revealed that the fit between instability and vertical participation was not significant, but the fits between variability and horizontal participation and between uncertainty and formalization were significant (p.<0.05) (Alexander & Randolph, 1985). The reported findings showed that "greater variability matched with greater horizontal participation increased the quality of care" and "greater uncertainty matched with greater formalization increased quality of care" (p. 855).

Alexander and Randolph's (1985) report did not discuss the amount of variability found in unit performance scores. Explanation was also not provided as
to how the findings relating to the fit variables might be affected by the lack of variability in the measures of unit structure.

Other issues involved with Alexander and Randolph's (1985) study relate to their conceptualization of structure. The authors' ability to describe structural variability may have been improved by broadening their definition of structure to include specialization. Structure as conceptualized by Van de Ven and Ferry (1980) incorporates the dimension of specialization. This dimension measures staff differentiation and was not included in Alexander and Randolph's measurement of structure. By broadening their conceptualization of structure, they may have improved the precision of their measurement of structure and thereby increased their probability of finding a difference between units.

Another issue associated with Alexander and Randolph's (1985) study, was that no conceptual basis was provided for explaining how nursing process was hypothesized so as to be an outcome variable. For this study, the use of process as an outcome is contradictory to task contingent model and King's (1981) description of the patient-environment interaction. The task contingent model, according to Van de Ven and Ferry (1980), places process as an antecedent to performance. From King's
(1981) perspective, process is also an antecedent to performance and the patient's health is the outcome of interest.

Currently, there are no investigations linking patient health to nursing unit work or structure. As previously presented, this study represents pioneering efforts at studying nursing unit work and structure in relation to functional health. In the next portion of this review, the literature on functional health that is relevant to this study will be presented.

**Functional Health**

In this study functional health was defined as "the extent of capacity to do those tasks needed for continued independent living in the community" (Fillenbaum, 1988, p. 10). According to Spector, Katz, Murphy, and Fulton (1987), there are two categories of activities which describe the functional ability of elders. These two categories are Activities of Daily Living (ADL) and Instrumental Activities Of Daily Living (IADL). "ADL functions represent activities that are essential for self-care (e.g., bathing, dressing, feeding). IADL functions represent activities that are necessary to adapt independently to the environment (e.g., shopping, transportation, housekeeping)" (Spector, Katz, Murphy, & Fulton, p. 381).
Studies have found a hierarchical relationship between ADL and IADL (Kemper & Suurmeijer, 1990; Spector, Sidney, Murphy & Fulton, 1987). Differences in ability to perform ADL and IADL have also been found to differ according to age and sex. Few persons aged 55 to 64 years have any ADL or IADL difficulties, but the rate of problems increases after age 65, and climbs sharply at 80 years and again at age 85 (Leon & Lair, 1990, p. 13). The rate of women to men with ADL and IADL difficulties also increases with age, with the percentage of women with problems increasing rapidly beyond 80 years of age (Leon & Lair).

Functional health as an outcome measure.

The research that was performed in hospitals and that measured functional health as an outcome is of particular interest to this study. In acutely ill elders ≥ 75 years of age, functional decline has been found to occur before admission and to worsen during hospitalization (Landefeld, Palmer, Kowal, Kresevic & Rosenblatt, 1991). Of the 154 elderly patients admitted to a hospital’s medical service, Lansfield et al. (1991) found that functional decline occurred in 60% of the patients. This decline was also associated with serious sequelae: death; nursing home placement; and professional assistance at home.

To enhance the discharge status of hospitalized
elders, units referred to as geriatric units have been created. Rubenstein, Rhee, and Kane (1982) reviewed the literature on geriatric care units and found that the most widely used patient outcome measure was functional health. The authors also found that the geriatric units varied in terms of their goals, target populations, and types of setting. Of interest to this study are the investigations that occurred on units found in acute care hospitals.

Within an acute care hospital setting, Sloane (1980) conducted a longitudinal prospective study involving 29 elderly patients. The patients were consecutively admitted to the geriatric care unit of an acute care urban teaching hospital. Upon admission, all patients included in the sample were judged to be in need of nursing home placement. The purpose of the investigation was to see if the elders admitted to the geriatric unit benefited from their hospitalization. The outcome of interest in Sloane’s study was placement and relocation at a less intensive level of care. Of the 29 patients cared for on the unit, eight were subsequently placed and retained for three months after discharge at a level of care less intense than that provided by a nursing home (Sloane). The environment of the study was described by stating that the patients were hospitalized on a geriatric unit. A brief description was then provided for the geriatric unit.
and hospital. The objectives of the unit were to treat the patients' medical problems and, if possible, rehabilitate the patients (Sloane). No information was provided about the unit's structure and no mention was made about the distribution of authority, extent of standardization, or the degree of staff specialization.

In another longitudinal study, Rubenstein, Wieland, English, Josephson, Sayre, and Abrass (1984), collected functional health information on 255 elderly hospitalized patients. All of the patients were admitted to a specific geriatric unit during its first four years of operation. Of the 255 patients, 38 were found to be at the top functional level using Katz Activities Of Daily Living (ADL) Index upon admission and were therefore incapable of improving their ADL scores. Of the remaining 210 patients, however, 131 improved in their ADL scores (p<0.001) and 112, who were expected to require institutional placement, went home.

Like Sloane (1980), Rubenstein et al. (1984) described their patient environment as a geriatric unit. No information was provided about the unit's structure or patients in comparison with other units. Such information is needed to compare the geriatric unit to others and to begin to understand the reasons for its effectiveness.

In another study of hospitalized elders, Harrell,
McConnell, Wildman, and Samsa (1989) focused on the goal directed behavior of the nursing staff. The purpose of the study was: (a) to identify the nursing diagnoses most common for hospitalized elders and (b) to explore the effects that nursing diagnoses had on the elders' functional status and institutionalization.

For the study, a sample of 150 patients was obtained by combining two samples from two medical units (Harrell, McConnell, Wildman & Samsa, 1989). Both units were located in a 600 bed teaching hospital. One unit admitted all private medical patients and practiced primary nursing. From this unit, all patients (n=139), age 65 and older, who were admitted during a seven month period were included in the sample. From the second unit, 11 patients who were, "demographically and medically similar to the patients on the private unit" were added to the sample (Harrell et al., p. 14). The second unit differed from the first in that it admitted general teaching patients and practiced team nursing.

Functional status measures were taken for each patient by one of the investigators on admission and at discharge using Katz's ADL Index (Harrell et al., 1989). Information about each patient's nursing and medical diagnoses, age and sex was obtained from the patient's chart.
For their total sample of patients, Harrell et al., (1989), found that nursing diagnoses were identified for 68% of their patients. The diagnoses most often identified were: home maintenance management, impaired (64 times); injury, potential for (16 times); skin integrity, impaired (13 times); mobility, impaired physical (13 times); ineffective breathing patterns (13 times) (Harrell et al., pp.15-16). "The presence of at least one nursing diagnosis at admission was associated with greater functional impairment at admission and greater recovery of function during hospitalization" (Harrell et al., p.16). Improved functional status was found to be greatest in terms of bathing, dressing, toileting, and transferring.

As for predictors of institutionalization, the only two variables found to be statistically significant in predicting discharge placement were the admission Katz score (p<.01) and the number of admitting medical diagnoses (p<.05) (Harrell, McConnell, Wildman & Samsa, 1989). Age was not found to predict institutionalization or discharge functional status. Harrell, McConnell, Wildman and Samsa's findings did not describe the number of patients for whom functional status improved or differences found in the structure of the two medical units. According to Alexander (1982), the unit with the team nursing may have been higher in terms of
standardization and specialization and lower in terms of distribution of authority to staff. The unit with team nursing would therefore have been task-centered while the primary unit would have been more goal-centered. According to Alexander and the framework provided in this study, structural differences between the two units may have related to differences in patient functioning.

For the functional health studies presented in this review, the research aims were all found to focus on detecting changes in patient functional health. Of the studies presented, all successfully detected improved ADL ability in a sizable number of patients. In the three studies presented, improved functioning was related to care of patients on a specific unit or the goal directed behaviors of the nurses. In none of the studies presented was the structure of the nursing units actually measured. Currently, there are no published investigations linking patient health to nursing unit work or structure.

Summary of the Review of Literature

Improved functional health and decreased need for nursing home placement has been found to occur in patients that were hospitalized on geriatric care units (Rubenstein, Wieland, English, Josephson, Sayre & Abrass, 1984; Sloane, 1980). Many hospitals, however, do not have
geriatric care units and much of the care for the hospitalized elderly is provided on units that do not specialize in the care of elders. The numbers of hospitalized elderly patients is also expected to continuously increase so that the creation of geriatric units may not be appropriate.

Nurse executives need a framework to prescribe structures of nursing units that promote functional health in elderly patients. For such a framework or theory to be applicable to practice, the interaction between patient needs and unit structure must be understood and validated through research.

No research has been published to date that address the relationship between patient needs and unit structure in relation to patient outcomes. The studies that have investigated structure of nursing units have not measured the health of patients as an outcome variable (Alexander & Randolph, 1985; Calkin, 1980; Comstock & Scott, 1977; Hrebiniaik, 1974; Leatt & Schneck, 1982a, 1982b). Despite their limitations, the studies did provide support for future research at the unit level by finding and describing differences in the work among hospital nursing units.

Overton, Schneck, and Hazelett (1977) and Leatt and Schneck's (1981) studies were of particular interest in
that their findings regarding the care of aged patients were contradictory to their expectations. The medical and auxiliary units which cared for elderly patients were unexpectedly found to be low in variability and intermediately high in uncertainty. Overton, Schneck, and Hazelett thought that the care needs of elderly patients were "routine" and were surprised to find that the care needs of aged patients were not "routine" and were instead found to be associated with a relatively high degree of uncertainty.

The preceding findings are consistent with Van de Ven and Delbecq’s (1974) hypothesized placement of nursing units within their taxonomy. They believed that nursing units range from low to intermediate in variability and low to high in difficulty.

In developing the taxonomy of unit structures within the task contingent model and then revising the OAI to measure the dimensions of each concept, Van de Ven and others have initiated the efforts needed to develop a framework for investigating the relationship between a unit work and structure. However, conceptual definitions must be refined for this framework to be applicable to research involving patient outcomes. Efforts such as those found in this study are needed to reconceptualize work and unit performance from a nursing perspective such
as that provided by King's (1981) framework. Research using patient samples and hospital settings is then needed to test the hypotheses generated by the task contingent model.
CHAPTER III

Methods

Design

A descriptive correlational design was selected for this study. The advantage of this design, unlike an experimental design, is that it captures variations in the independent variables that occur through a natural course of events. When independent variables are artificially manipulated, as in an experimental design, problems with external validity can occur in that the findings may not reflect real life situations (Babbie, 1979). In this study the independent variables, work difficulty and variability could not be manipulated in a realistic manner.

Lack of manipulation of the independent variables also created a limitation. Because the independent variables were not manipulated, the findings from this study cannot be used to explain the effects of the independent variables on dependent variables. As stated by Waltz and Bausell (1981, p. 240), "correlation does not imply causation and the results of descriptive correlational studies can not be correctly used to speak of the effect of one variable on another." Descriptive correlational research findings, however, can be used to delineate how variables systematically vary together.
(Waltz & Bausell). For this study, variation in the functional health of hospitalized elderly patients was measured in relation to the work and structural characteristics of nursing units.

The conceptual framework for hypothesizing interrelationships between work and structure, in relation to functional health, was provided for this study by Van de Ven and Ferry's (1980) task contingent model. In defining the congruence between work and structure, the task contingent model begins by defining work and structure as multidimensional concepts.

As previously presented, Van de Ven and Ferry's (1980) task contingent model proposes relationships between specific dimensions of work in terms of specific dimensions of structure. The task contingent model, as interpreted for this study, interrelates variability, specialization and standardization in relation to functional health. A relationship is also proposed between the difficulty of the work and distribution of authority to staff in relation to functional health (Van de Ven & Ferry).

The task contingent model does not yet provide calculations for combining dimensional measures in a manner that would portray an aggregated measure for work or structure. Instead, relationships to unit performance
are proposed which match specific dimensions of work to specific dimensions of structure.

**Hypotheses**

Based upon the relationships proposed by the task contingent model, it was hypothesized that:

(H-1) On a nursing unit, as the work variability increases and staff specialization decreases, there will be an associated increase in the functional health of the unit’s elderly patients.

(H-2) On a nursing unit, as the work variability increases and standardization decreases, there will be an associated increase in the functional health of the unit’s elderly patients.

(H-3) On a nursing unit, as the difficulty of a unit’s work and distribution of authority to staff increases, there will be an associated increase in the functional health of the unit’s elderly patients.

To provide the information needed to test the preceding hypotheses, unit level measures for each variable were taken by aggregating information obtained from individual head nurses and staff and patient participants. The data collected was then analyzed using multiple regression. (See Table 2 in Appendix B for a listing of the variables and their sources of
measurement).

Sample

Obtaining a sample of nursing units and subsequent participation from each unit's staff and patients required a multistage sampling procedure. The original plan was to apply cluster sampling and randomly select 5 hospitals, and 4 units per hospital (n=20). As will soon be revealed in greater detail, the limited number of units made random selection impossible.

The following sections of this chapter address each phase of sampling. A presentation of the hospital and unit sample is followed by descriptions of each of the three groups of participants (head nurse, staff and patients).

Hospital Sample

Using a table of random numbers, the five participating hospitals in this study were selected from a list that included 6 of a convenient midwestern city's hospitals. The remaining 6 hospitals located in this city did not meet this study's selection criteria. To be included, the hospitals had to: (a) provide acute care health services to adult patients; (b) have patient populations that include patients who are 65 years of age or older; and (c) have at least four nursing units that meet inclusion criteria for this study.
Of the five participating hospitals, 3 were found to have more than 4 units that met the study’s inclusion criteria. These three hospitals had 1 or 2 additional units that were not chosen. For these hospitals, unit selection was based on which units cared for the greatest percentage of elders. Only one hospital had 6 units with equal portions of elderly patients. In this hospital, four units were selected using a table of random numbers.

**Nursing Unit Sample**

The number of units needed was calculated according to the number of independent variables found in each hypothesis. Based upon recommendations made by a consulting statistician (S. Amini, personal communications, May 25, 1990) a decision was made to select 10 units for each of the independent variable. Two independent variables were identified for each hypothesis. The sample, therefore, included 20 units.

The inclusion criteria for the 20 nursing units were devised to increase the likelihood of including units for which functional health was an appropriate priority. According to King’s (1981) framework, nursing units that cared for elderly patients who are discharged home should focus discharge planning efforts on optimizing functional health. Based upon this perspective, a decision was made to select nursing units that: (a) admitted patients that
were 65 years of age or older; (b) that discharged 70% of their elderly patients directly to their homes; and (c) were not a psychiatric or specialty unit that transfers patients to other units prior to discharge.

The head nurse participants.

Once the sample of nursing units was obtained, efforts were directed at obtaining head nurse participation from each nursing unit. A head nurse in this study was the nurse who had 24 hour responsibility for the management of a nursing unit. For a nursing unit to be included in the study, the head nurse of that unit had to qualify for participation by consenting to participate in the study through completion of the Organizational Assessment Instrument (OAI) Unit Supervisor Questionnaire and by having been in his/her current position for at least three months. Of the head nurses approached for this study, only one declined participation.

The staff nurse participants.

A staff nurse in this study refers to a registered nurse whose primary job responsibilities involve direct patient care. To identify staff nurse participants from each unit, the head nurses developed a list of the unit’s registered staff nurses who (1) had been employed on the unit for at least three months; (2) were scheduled to work
during the following two weeks; and (3) generally worked at least 32 hours per week.

Of the 20 units, only 3 had 15 or more staff who met all of the inclusion criteria. Random selection was applied to select 12 staff from each of these units. On the remaining 17 units, the Unit Member OAI was distributed to all staff who met the inclusion criteria. As in Van De Ven and Ferry's (1980) investigation, the minimum number of staff required for a unit to participate, was established as 5 participants. All units met this requirement. Of the 214 Unit Member OAI distributed, 168 (78%) were returned. As listed in Table 3, the lowest number of staff participating per unit was 5, and the unit response rates ranged from 62 to 100%.

The patient participants.

The number of patient participants per unit was based on what the researcher believed would be achievable. The researcher reviewed the daily admissions for 6 nursing units during a two week period and found that the smallest unit admitted 12 patients that could qualify as participants. A decision was made to allow for some attrition and refusals and to select the first ten available patients per unit.

In 3 of the 5 hospitals, patients documented their consent for participation by signing a consent form. In
the remaining two hospitals patients gave verbal consent. For this study patients qualified for participation by being assessed by their assigned nurse and evaluated as: (a) age 65 years or older; (b) alert and oriented; (c) expected to return home upon discharge; and (d) be admitted not more than 48 hours before the first interview. Each patient also needed to be available for the second interview that occurred within 48 hours of discharge.

To obtain participation from 200 patients (10 patients per unit for 20 units), required enrollment of 268 patients and actually took from 4 to 8 weeks per unit. The primary culprit for the prolonged period of data collection was patient attrition. Although the attrition rate across all patient participants was less than 26% (n=68), the loss of patients per unit, ranged up to 12 patients. The researcher typically enrolled up to 10 patients per unit, lost patients and then had to reinstate enrollment.
Table 3.

**Number of Staff Nurses Per Unit Who Received and Completed the OAI**

<table>
<thead>
<tr>
<th>UNIT</th>
<th># OF OAI DISTRIBUTED</th>
<th># OF OAI RECEIVED</th>
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<tr>
<td>1</td>
<td>12</td>
<td>8</td>
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<tr>
<td>2</td>
<td>12</td>
<td>9</td>
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<tr>
<td>3</td>
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<td>21</td>
<td>12</td>
<td>9</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>214</strong></td>
<td><strong>168 (.78)</strong></td>
</tr>
</tbody>
</table>
Patient attrition most often occurred because patients were transferred to other units or discharged to nursing homes (see Table 4). The patients who transferred to other units, were transferred to a different service, private rooms and occasionally intensive care units. On units three and four, which had exceptionally high attrition rates, the discharges to nursing homes generally occurred as on other units, giving the patient additional time for recuperation versus a decline in condition. Unit three also dropped 4 patients because they were discharged in less than 48 hours from admission. This attrition occurred because the unit contact person forgot that the patients needed to be hospitalized for at least 48 hours.
Table 4.

Reasons for Patient Attrition by Nursing Unit

<table>
<thead>
<tr>
<th>UNIT CODE</th>
<th>DISCHARGE NURSING HOME</th>
<th>TRANSFER TO ANOTHER UNIT</th>
<th>ADMIT &lt;48 HOURS</th>
<th>DID NOT ANSWER PHONE</th>
<th>REFUSED 2ND INTERVIEW</th>
<th>DIED</th>
<th>READMITTED</th>
<th>TOTAL LOST</th>
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Note: Of the 158 elders approached for this study, 68 (25%) were unable to complete both interviews.
Measurement of Variables

This section of chapter three describes how variables in this study were operationalized and measured. First, the demographic information collected on all participants is discussed. Information about how the variables were operationalized follows.

Demographic Information

Due to the pioneering nature of this investigation, much effort was used to provide detailed descriptions of each group of participants and the nursing units. Appendix B summarizes the demographic information, identifies how each variable was measured and provides operational definitions for variables that were not self-explanatory. As noted in the tables found in Appendix B, each demographic variable had one source of measurement. For this study, the researcher did not believe that the measurement of the demographic variables warranted validation.

All measures of the demographic variables except for the nursing diagnoses of the patients, were obtained directly from the participants via interview, self-administered questionnaire, or from the medical records. The patients' admitting nursing diagnoses, however, were not listed in any of the medical records and had to be
deducted from the patients' admission assessments by the interviewers. To assist with this process the researcher developed the Nursing Diagnoses Instrument (NDI).

The Nursing Diagnoses Instrument.

The NDI in Appendix C was used to obtain a general description of the admission health status of each unit's patients. The NDI contains an alphabetical listing of the nursing diagnoses and definitions approved by the North American Nursing Diagnosis Association (NANDA) at its Eighth National Conference.

The validity of using nursing diagnosis to identify actual or potential health problems has been assessed by comparing the consensus between nursing diagnoses taxonomy and supporting clinical data. Using the preceding method, Jones and Jacob (cited by Gordon, 1985), found 76% agreement in a sample of 2,700 diagnostic labels and 95% agreement in a second sample of 270 diagnostic labels. Validity was also assessed by correlating the number of nursing diagnoses with a measure of nursing workload. Using this method, Halloran (1985) revealed significant findings ($r^2 = 0.532$, p<0.001). The interrater reliability of nursing diagnoses has also been assessed. Halloran's (1985) sample of 806 patient days revealed an interrater agreement between nurses on the presence or absence of
specific diagnoses of 91%.

The pretest of the NDI

In a pilot study conducted by this researcher in 1989, 16 pairs of staff nurses applied the current version of the NDI to 63 patients (Table 9 in Appendix D lists the frequencies of agreement and disagreement for each diagnoses). Phi, Kappa and percent of agreement were calculated for the observed diagnoses.

The final calculation which was based on the total frequencies across all diagnoses relevant for the patients observed (N=3993), revealed a Kappa of 0.42. This value fell within the range of 0.41 - 0.60, and as suggested by Landis and Koch (1977), was interpreted as indicating moderate agreement between raters.

The evidence provided by the pilot study and other investigations, provided sufficient measures of reliability and validity of nursing diagnoses. Further evaluation for this study was, therefore, not warranted.

Measurement of the Independent Variables

The independent variables for this study consisted of the work and structural characteristics of the nursing units. These variables were measured by aggregating head nurse and staff responses to specific subscales contained in the Organizational Assessment Instruments (OAI). The OAI, developed by Van de Ven and Ferry (1980) in service
organizations, measures several aspects of work structure and process. Of the OAI subscales, the two work subscales, and three structure subscales were applicable to this study. Not used were the subscales relating to personnel expertise, unit process, such as work flow, and decision making authority of personnel, with the exception of the staff nurses.

The OAI has two subscales to measure unit work in terms of variability and difficulty. The three item subscale for variability measures the degree to which the patients' needs are familiar to the unit's nursing staff (Van de Ven & Ferry, 1980). The three item subscale for difficulty ask how easily the unit's nursing staff can identify the patients' needs and outcomes (Van de Ven & Ferry).

To measure the structure of nursing units, the OAI contain subscales for standardization, specialization, and distribution of authority. Each subscale contains three items. The standardization subscale measures the extent to which rules, standards, operating procedures, and performance expectations are specified (Van de Ven & Ferry, 1980). The specialization subscale measures the degree of functional differentiation among unit personnel (Van de Ven & Ferry). The distribution of unit authority subscale measures the extent to which unit members make
decisions about the unit's tasks, performance criteria, and rules (Van de Ven and Ferry).

Both versions of the OAI, the Unit Supervisor in Appendix E and the Unit Member in Appendix F, contain 39 items and the same subscales for measuring unit work and structure. The Unit Supervisor OAI also contains 9 additional items that ask about the unit's staff positions, work flow interdependence and coordination processes.

In the OAI, participants were directed to circle responses in a Likert format and to complete short answers. The responses were then averaged across respondents for each nursing unit for each subscale, thus forming an aggregated measure of each independent variable for each unit. (To identify the questionnaire items according to subscale, refer to Table 10 in Appendix G).

The reliability and validity of the OAI.

The reliability and validity of the original OAI was assessed on a sample of 334 units in an Employment Security Agency (Van de Ven & Ferry, 1980). To evaluate the reliability and content validity of the OAI, Van de Ven and Ferry analyzed their data with factor analysis; coefficient alpha; median correlations with other indices; and correlations with parallel measures. The authors found that the instrument's task and structure dimensions
detected as predicted, systematic and significant differences between five types of units. The findings also provided information that was used to revise the OAI.

To meet the needs of this study, additional revisions were made to the work subscales of the 1980 version of the OAI. As outlined in Appendix H the original subscale items for variability and difficulty were generalizable to any job. To clarify the meaning of these items to reflect the work of nursing units, the researcher reworded the items to focus on patient needs and associated tasks. These revisions as listed in Appendix H were made with Van de Ven’s permission and were consistent with Van de Ven and Ferry’s (1980) framework. (See Appendix I for letter documenting this permission)

First pretest of the OAI

To assess the internal consistency of the revised variability and difficulty subscales on a sample of nurses, this researcher, in 1989, administered the modified questionnaires to 47 staff nurses and 4 head nurses. From the aggregated responses for each subscale, Chronbach alpha was then calculated. For each subscale the Chronbach alpha was as follows: variability, 0.1; difficulty, 0.72; standardization, 0.1; specialization, 0.61 and distribution of staff authority, 0.87.

Because of the limited number of items per subscale,
the decision was made to accept items as being internally consistent if the alpha was greater than or equal to 0.6. Based upon this criteria, the subscales for difficulty, specialization, and distribution of authority were determined to be internally consistent. The subscale items for variability and standardization, however, were found to be in need of further modification.

The researcher compared the nurse pretest findings to those from Van de Ven and Ferry's (1980) sample in determining the revisions needed. Unlike those found in the nurse pretest, the alpha coefficients in Van de Ven and Ferry's sample ranged from 0.7 to 0.9. For the nurse pretest, however, the alpha coefficients on the variability and standardization subscales were much lower (0.1). This lower alpha on the nurse responses indicated to the researcher that the nurse sample might be interpreting the questions in the variability and standardization subscales in a manner unlike that of Van de Ven and Ferry's (1980) sample. The researcher, therefore, proceeded to validate the meaning of the variability and standardization items with head nurses and staff nurses.

The researcher asked head nurses and staff nurses to review the items in the variability and standardization subscales. For the variability items, confusion had
resulted by using the terms "clinical work" and "client". Due to the hospital’s recent guest relations program, the term "client" had been broadened to include physicians in addition to patients. The term "clinical work" was intermittently interpreted to include activities unrelated to patient care.

One item in the standardization subscale confused the staff. This item asked how frequently staff deviated from policies and procedures. Staff members questioned whether this meant that policies were not followed because staff performed tasks inappropriately or because patient needs required the deviation.

The researcher used the preceding feedback to create the new items now contained in the variability and standardization subscales. The preceding findings and additional modifications were shared with Van de Ven and permission was obtained to use the revised OAI. Appendix I contains the letter documenting this permission.

The other item that was revised from the pretest asked respondents to list and rank five criteria that were used to determine how effectively the unit performs its work. Based on the pretest, this item was changed to listing five criteria and asking the respondents to then rank them, 1-5, from most to fifth most important. The criteria listed were inclusive of all criteria identified
by the 51 pretest respondents. The five criteria identified though this process were: patient satisfaction, staff satisfaction, physician satisfaction, quality of documentation and ability to function within the boundaries of the unit's budget.

**Second pretest of the OAI**

A second pretest of the OAI was conducted to assess the impact of the item changes on the internal consistency of the variability and standardization subscales. For this pretest, the researcher administered the OAI to a convenience sample of 21 nurses. For each subscale the Chronbach alpha was as follows: variability .83; difficulty .61; standardization .76; specialization .76; and distribution of authority to staff .87. As with the first pretest, the desired Chronbach alpha for each subscale was $\geq 0.6$. Based on this criteria and the preceding findings, all subscales were believed at this point to be internally consistent. Because of the small sample used in this pretest, however, the researcher viewed the preceding findings with caution and plans were made to reassess the internal consistency of the subscales on the responses obtained from this study.

**Internal consistency of OAI subscales in the research sample.**

From this study the researcher obtained 168 staff
nurse responses to the OAI. The Chronbach alpha for each subscale for this sample was as follows: variability, .67; difficulty, .57; standardization, .59; specialization, .58; and distribution of authority to staff, .78. Keeping in mind the limited number of items per subscale, the researcher interpreted these findings as indicating that the items in each subscale were responded to in a fairly consistent manner.

**Measurement of the Dependent Variable**

The dependent variable for this study, functional health, was measured using the Activities of Daily Living Section (ADLS) of the 1988 edition of the OARS Multidimensional Functional Assessment Questionnaire (OMFAQ). The development of the OMFAQ began in 1972 at Duke University, as an integral part of the Older Americans Resource and Service Program (Fillenbaum, 1988). This program, also referred to as Duke OARS, was funded by the Administration on Aging with the intent of exploring alternatives to institutional care for impaired elders. The OMFAQ was thereby developed through multidisciplinary efforts to assess not only functional status but also service use (Fillenbaum).

The OMFAQ has two major parts which contain multiple subparts. Part A assesses individual functioning in five areas (social, economic, mental and physical health,
activities of daily living) (Fillenbaum, 1988). Part B assesses service use in terms of 24 generically defined services such as physical therapy and mental health (Fillenbaum). As noted by Fillenbaum, the instrument is constructed in such a way that it may be used in its entirety or only in part or subpart.

For this study, the researcher chose to use only the ADLS subscales. This decision was based upon the timing and purpose of the study’s assessment of functional health. The goal of functional health measurement in this study was to assess for changes during an acute care hospitalization. Additionally, the functional health changes of interest are those that could conceivably occur in relation to the patient’s interaction with the nursing staff.

There is support in the literature for anticipating changes during an elderly patient’s hospitalization in terms of ADL (Rubenstein, Wieland, English, Josephson, Sayre & Abrass, 1984; Sloane, 1980). In the OMFAQ, the sections, with the exception of ADLS, assessed aspects of functioning that may not be subject to change during a hospitalization. Marital status, for example, is ranked in the social scale as a measure of social functioning. Other examples are questions concerning eye sight and hearing that are asked to assess physical functioning.
The researcher did not believe that changes in marital status, hearing, or eye sight were likely to occur during a hospitalization.

The ADL of interest to this study refer to the patient's "capacity to do those tasks needed for continued independent living in the community" (Fillenbaum, 1988, p. 10). The subscales in the ADLS includes 13 items that rate the patient's needs for assistance on a scale of zero to two. A value of zero is assigned if total assistance is required, a value of one indicates that some assistance is needed, and a value of two indicated that the patient performed the activity independently. A total score can range as low as 0, indication total dependence, to a score of 26, which indicated total dependence.

The first seven items in the ADLS found in Appendix J, assess instrumental ADL (IADL), asking about the patient's ability to use the telephone, travel, shop, cook, do housework, take medication and handle money. The next seven items ask about physical ADL (ADL) in terms of the patient's ability to eat, dress, groom, walk, get out of bed, take a shower, and get to the bathroom on time. The last or fourteenth item in the ADLS asks if there is someone who can help the patient and, if so, what is their relationship.
The validity and reliability of the ADLS

As part of the OMFAQ, the ADLS "is the result of an iterative procedure which started by selecting items, pretesting them for comprehension with elderly community and institutional residents, rephrasing them to improve clarity and rearranging them to facilitate flow" (Fillenbaum, 1988, p. 13). The functional health items "are those which, having survived this process, best discriminated between excellent and totally impaired functioning and were clinically important" (Fillenbaum, p.13).

Fillenbaum reports evidence of the content validity of the OMFAQ, from information gathered from 10 major OARS-based studies (n=6174). To obtain an even distribution of impairments, a subsample was then selected (n=2036). Finally, factor analysis was performed, revealing 11 factors (Fillenbaum). Two of the factors contained the items from the ADLS. The items for physical ADL separated into one factor while the items for IADL separated into an additional factor. The reliability coefficients found were 0.87 for IADL and 0.84 for physical ADL (Fillenbaum).

To assess criterion validity, OMFAQ based ratings for 33 elderly clinic patients were compared to home visit assessment ratings made by physical therapists on a 12-
point therapist-developed scale (Fillenbaum, 1988, p. 14). A significant level of agreement (Kendal's tau=.83, p>.001) was found between the OMFAQ ratings and therapist ratings (Fillenbaum).

To assess inter-rater reliability, 11 users of the OMFAQ (five researchers and six clinicians from 9 states) were given copies of interviews taken on 30 participants from the validity study (Fillenbaum, 1988). Each rater was asked to assign a rating to each of the five functional scales for each participant. The correlation between raters for the ADLS was found to be significant (r=.86, p>.001) (Fillenbaum).

In summary, the preceding findings support Fillenbaum's (1988) reference to the OMFAQ as a valid and reliable questionnaire for assessing the overall functional status of the elderly. For this study, since no changes were made in the instrument, reassessment was limited to a pretest and calculation of Chronbach alpha for each section. Consent for the use of the instrument in the pretest and the study was obtained from Duke University (See Appendix I for letter).

**Pretest of the ADLS.**

To pretest the instrument, the researcher used the ADLS to interview a convenient sample of 10 hospitalized elders. The purpose of this pretest was to identify and
troubleshoot any unanticipated problems with the tool and interview process. All interviews were completed within 15 minutes with no apparent distress to participants. After the interviews were completed, the researcher discussed the responses with each participant. All 10 participants believed that the ADLS appropriately summarized their functioning terms of physical ADL and IADL.

**Internal consistency of ADL and IADL Subscales with this study’s sample.**

To reassess the internal consistency of the items in the ADL and IADL subscales, the researcher calculated Chronbach alpha using the patient responses obtained from this studies admission interviews (n=200). As found in Fillenbaum’s, the reliability coefficient was .87 for the IADL Section, and .84 for the ADL Section.

**Research Procedures**

**Hospital Access**

The researcher gained approval for access to each hospital through each institutions review board and or nursing research committee. The researcher then obtained a listing of units that meet the study’s inclusion criteria from the nursing administrator or research committee delegate. After the units were selected, the
hospital contact person contacted the head nurses and allowed them the opportunity to schedule or decline from meeting with the researcher. Of the 21 head nurses approached, only 1 declined participation.

**Access to Nursing Units**

The researcher met with the head nurses individually. At the meetings the researcher described the study’s purpose and the nature of head nurse, staff, and patient participation. Considerations taken to protect the rights and privacy of participants were discussed. During the meetings the researcher obtained each head nurse’s verbal consent, and then ask demographic questions about the unit (refer to Appendix K for unit demographic questions). Before concluding the meetings, the researcher gave each head nurse a canvas tote bag to serve as a gift, and an envelope, that included a cover letter and the Unit Supervisor OAI. A copy of the Unit Supervisor OAI and cover letter is included in Appendix E.

**Access to Staff**

Head nurses consistently acknowledged that work constraints did not afford opportunities for the researcher to meet with staff members. The head nurses did, however, assist by distributing and collecting the questionnaires. To facilitate this distribution, the Staff Member OAI found in Appendix F was reduced into a
booklet that fit easily into a legal size envelope. Attached to each OAI cover letter, was a pen on a rope that was included as a gift.

The staff members were assured via the cover letter, that the study was not associated with the hospital and that participation was voluntary. Data coding and aggregation procedures that ensured confidentiality of responses were also summarized. Staff members were instructed not to place their names on the questionnaire, if they wanted results of the study sent to them, they were to address the envelope to themselves. If staff did not want to participate, they were to remove the pen and return the questionnaire in the sealed envelope unanswered. The envelopes were returned by the staff to the head nurses who gave them to the researcher. Staff members were instructed to return the questionnaires within a week. However, questionnaires were returned throughout the 4 - 8 week periods of data collection.

Access to Patients

Each head nurse or delegate served as a unit contact person. This person maintained awareness of the unit's daily admissions and discharges. When a potential patient participant was admitted, the contact person obtained permission for the interviewer to visit, discuss the study, and recruit the patient as a potential participant.
The interviewer usually checked for potential patient participants and discharges by calling the unit contact person 3-4 times a week, excluding weekends and holidays.

Pending patient approval, the interviewer visited with the patient and explained the purpose of the study. The patient was asked to participate in the study by answering questions about individual care needs and by allowing the researcher to review the patient's medical record for demographic data. Information about the study and patient participation was also provided to each patient in writing via the one page summary contained in Appendix L. Patients verbally consented to participate. In 3 out of 5 hospitals consent was also documented by signing the consent form in Appendix L.

During the introduction, each patient was told that two interviews were needed, and that the second interview would occur via phone at home after discharge. Each patient was also told, that the interviews would take about 15 minutes and consist of questions about the patient's daily activities and needs for assistance. Each patient was assured that interview responses would be kept confidential and not shared with the patient's care providers. The patient was also informed that the study was not associated with the hospital and that participation was voluntary and could be withdrawn at any
time. Finally, the patient was provided with an opportunity to receive a report of the study’s finding by filling in their name and address on an index card.

To conduct the interviews, the researcher recruited assistance from 3 gerontological clinical nurse specialists, one clinical nursing instructor and two registered staff nurses. All interviewers had prior experience in interviewing elders and were familiar with the institutions involved. The researcher oriented the interviewers on an individual basis to the interview format and coding of responses. To orient the interviewers, the researcher used scenarios experienced by the researcher while conducting the first 130 interviews. All interviewers learned the process quickly and had no difficulties in conducting the patient interviews.

The patient interviews were conducted using the structured format provided by the Activities of Daily Living Section (ADLS) of Duke University’s OARS Multidimensional Functional Assessment Questionnaire (OMFAQ). The ADLS, contained in Appendix J, provides 13 questions that ask the patient how much assistance is needed to perform both basic and instrumental ADL. The last question in the scale asks if there is someone who can help the patient and what is the relationship of this person. For each patient’s demographic data, the
interviewers used the demographic information form contained in Appendix M, to record data - the patient's age, sex, date of admission, and the admitting, medical, and nursing diagnoses from the medical record. Since none of the records listed the admitting nursing diagnoses, the interviewers had to improvise by analyzing the information provided in the admission assessment and then developed a list of nursing diagnoses. The interviewers used the Nursing Diagnoses Instrument (NDI) contained in Appendix C for recording the patient's diagnosis. The purpose of recording the nursing diagnosis information is to provide a description of the admission health status of each unit's patients.

**Human Subjects Considerations**

The study was approved by the internal review boards and nursing research committees of Frances Payne Bolton School of Nursing and the 5 selected hospitals. The procedures established by each board or committee required minor modifications across hospitals in: 1) the content and use of a patient consent form; and 2) the need to notify the patient's physician of the patient's potential involvement. One hospital differed by also requiring that the researcher received approval for staff nurse participation from the registered nurses' bargaining unit.
The procedures set by each institution for ensuring protection of human subjects were observed. As outlined, all participants received explanations of the study's purpose and significance. Head nurses and staff received this information via the cover letters that were attached to the OAI. Patients received this information verbally and in writing (refer to Appendix E or F for OAI cover letter and Appendix L for patient letter). Participants were also informed that participation had no anticipated risks, was voluntary and could be discontinued at any time. The participants were informed of and provided with the opportunity to have the results of the study sent to them, and were given the researcher's home phone number to call for questions. The data coding methods that ensured confidentiality were also described to all participants. The individual responses were recorded numerically and averaged to form a unit score. Each unit score was also assigned a number and pooled into a sample of 20 units.

Additional steps to ensure protection of all participants were tailored according to the nature of participation and outlined in the letters given to the participants. The next two subsections of this chapter summarize the considerations taken specific to each group of participants.
Head Nurse and Staff Nurse Participants

Head nurses and selected staff nurses were assured that the study was not associated with the hospital and that their choice to participate was unrelated to their evaluations and employment. Nurse participants were also informed that their choice regarding participation was to be kept confidential and that no records were being made which might identify anyone by name. Consent was then provided by head nurses and staff nurses through their completion of the OAI. Any nurse not wishing to participate returned the questionnaire unanswered.

Patient Participants

Patients were assured that the study was not associated with their hospital and their choice to participate would not influence the care they receive. Patients were also not approached by the researcher unless permission to do so has been first obtained from the unit contact person. As previously discussed, 3 out of 5 hospitals required a consent form and one hospital required written notification of the patient’s potential participation. This notification was provided by attaching to the patient’s chart a standardized note, addressed to the patient’s physician (refer to Appendix L for the note).
Data Analysis

This research was designed to test a task contingent model. This model hypothesizes relationships between nursing unit work and structure in relation to a patient outcome. Analysis for this study included: 1) description of the data at unit, individual participant level, including analysis of variance among the units for pertinent variables, and correlations among variables and 2) tests of the models ability to explain the functional health of hospitalized elders. To test the model, hierarchical regression was applied.

Computation of Variables

The variables in this study were interval level measures and the unit of analysis for all variables was the nursing unit, rather than individual nurses or patients. To obtain a unit score for the independent variables, individual unit's head nurse and staff responses to the items in each pertinent OAI subscale were first calculated by averaging each individual's responses to each variable's subscale items. Aggregation of head nurse and staff data proceeded, as in Van de Ven and Ferry's (1980) study, by assigning equal weights to each unit's head nurse and staff scores. (Weights were assigned to head nurse (1/2) and unit staff (1/2)). The theoretical justification for this aggregation procedure
was that a work unit consists of two hierarchical levels: a first line manager and all the staff reporting directly to that manager (Hage & Aiken, 1967; Van de Ven & Ferry).

For the dependent variable, functional health, two measures were calculated. The first measure reflects functional health upon admission and the second measure reflects functional health after discharge. To calculate the functional health scores for each unit, individual patient responses to the ADLS were first summed. An average of the individual scores was then taken per unit.

**Descriptive Analysis**

Descriptive analysis in this study, provided demographic information on the nursing units and all participants. This analysis also provided the information that was later used to check assumptions made in performing hierarchical regression.

To calculate the statistics needed for this study Statistical Package for Social Sciences Program (SPSSPC) was used. The program for descriptive analysis was written to produce histograms and summary statistics for all variables, including the calculations of skewness, and all measures of central tendency. Next, the relationships between pertinent variables were evaluated by producing bivariant plots and calculating correlations.
Analysis of variance was then performed to assist with unit level comparisons for the independent and dependent variables. Work and structural variables, that were found to differ significantly across units, had homogeneity of variance assessed by calculating Cochran’s test statistic. Post hoc comparisons were also made between units on variable scores found to significantly vary across units. To identify which units differed, the Tukey HSD test was used and the alpha level was established at ≤ .05. According to Kirk (1982), Tukey’s method sets the experiment wise error rate at alpha for the collection of pairwise comparisons method, and is appropriate when the data is normally distributed, and has homogeneity of variance. Hayes (1981) also explains how Tukey’s test may be calculated for unequal sample sizes and that it has the advantage over Scheffe’s method by being less conservative. The researcher chose this less conservative method believing that the risk of a Type I error, at this point in the analysis, was outweighed by risks of a Type II error that were inherited with the nonexperimental design of the study.

**Inferential Analysis**

To test the hypothesis for this study, hierarchical regression was applied. As noted by Hayes (1981), multiple regression may be used to examine the
contribution to dependent variable variance made by the independent variables as they are added in some predetermined or hierarchical order. In this study, hierarchical regression was applied to examine the contribution unit work and structural characteristics made in the patient’s functional health at discharge. In building the regression equation, the patient’s functional health on admission was first entered as a covariate. Unit work and structural variables followed. The choice of entering the functional health on admission score first, was dictated by patients with lower admission scores and the need to take this into account before considering other variables.

**Mathematical model.**

The mathematical model for each hypothesis in this study was:

\[ \hat{Y} = a + B_1 X_1 + B_2 X_2 + B_3 X_3 + e \]

In this model, a given unit score for functional health at discharge variable \( \hat{Y} \) is a function of: \( a \) (the intercept, or average value of functional health \( Y \) when each independent variable equals zero); plus \( B_1 X_1 \) (the amount of variance accounted for by the admission functional health scores); plus \( B_2 X_2 \) (for each hypothesis this is the partial slope for the first independent
variable ($X_2$), or the average change in $Y$ associated solely with $X_2$; plus $B_2$, $X_1$ (the partial slope for the second independent variable); plus $e$ (the error term representing the variance accounted for by the other terms in the equation).

**Statistical assumptions.**

As noted by Berry and Feldman (1985), a regression equation assumes that the relationships between the dependent variable and each independent variable is linear and that the effects of the independent variables are additive (p. 10). The other assumptions are as follows:

1. the variables are measured without error at the interval level;
2. for each set of independent variables, the mean value of the error term is zero;
3. homoskedasticity is present, which means that the variance in the error term is constant for all values of $X$;
4. no autocorrelation, which means that the error terms are uncorrelated;
5. each independent variable is uncorrelated with the error term (correlation occurs when a relevant independent variable is excluded);
6. absence of multicollinearity, no independent
variable is perfectly correlated with another;
7. the error terms are normally distributed.

As discussed in detail in the next chapter, the data collected for this study was reviewed in reference to the preceding assumptions. For analysis of the data in relation to the error terms, residual analysis was performed. To assess for multicollinearity, a correlation matrix was developed and the correlations among the independent variables were reviewed.

**Evaluating statistical significance**

In testing the regression equations for the relationships hypothesized in this study, F values were calculated using the regression and residual sums of squares. As noted by Berry and Feldman (1985), the F value can be used to determine if the joint effects of all independent variables on the dependent variable is significantly different from zero.

In estimating the statistical significance of each F value, the level of significance in this study was preestablished at .05. The level of significance was also evaluated in relation to the power of the test, sample size, and the magnitude of the effect size.
Methodological Limitations

The descriptive correlational design chosen for this study created limitations in how the findings for this study could be interpreted. As a result of the threats to validity associated with this design, the findings from this study can not be interpreted as explaining how nursing unit work and structure affect the functional health of patients. Because the independent variables were not manipulated in a controlled environment, the possibility exists that any changes which occurred in the dependent variable, occurred in response to factors other than the specified independent variables. Such factors or threats to validity include: history, in terms of other change producing events; maturation of participants; the repeated use of the ADLS for admission and discharge measures; and statistical regression (Cook & Cambell, 1979). Limiting the period of data collection decreased, but did not eliminate, the threats of history and maturation. The researcher also noted when conducting the second interview, that patients generally remembered the researcher but not the specific questions or response format. The threat to validity created by repeated testing may have been decreased by the interviews short administration time and the timing of the interview.

Another limitation of this study relates to the lack
of variance found in the nursing units work and structural characteristics. As noted by Cohen (1988), the relationships between independent and dependent variables found in behavioral research is likely to be small. This occurs because of reduced validity of the measures and methods employed and the complexity of the phenomena studied. For this study, validity was basically threatened because patients were not randomly assigned to units with known work and structural differences. If the units varied in their work and structural characteristics, random assignment of patients would have decreased the possibility that patients on some nursing units, had characteristics unknown to the researcher which may have influenced their functional health during their hospitalization. As will be discussed later, this problem may have been compounded because the work and structure characteristics of the unit were not manipulated and the low variance across units could not be altered.

The final limitation for this study constrains the generalizability of the study’s findings to a single city. Sample selection poses limitations in that the hospitals and respective nursing units represent only those of a particular city. Resource constraints prevented the researcher from expanding the study to include a larger region.
CHAPTER IV
Results

This chapter begins with a presentation of the demographic characteristics of the nursing units, staff and patient participants. Measurement of the variables follows the demographic information. The chapter concludes with the tests of the hypotheses and the results found in checking the data against the assumptions of multiple regression.

Nursing Unit Characteristics

Census

The 20 nursing units ranged in size from 22 to 52 beds with an average daily census across units of 30.6 patients (see Table 11). Units with a greater number of beds were found to have a higher daily census (r=.9, p<.001) and a greater number of staff positions (r=.54, p<.01).

During this study period the average occupancy rate for this sample of units was 81%. Twenty-five to eighty-five percent of each unit’s patients were over 65 years of age. No relationship was found between the units’ average daily census and percent of patients over 65 years of age (r=.02).
Staffing

Unit staffing for this sample of 20 nursing units ranged in full time equivalents (FTE) from 18.5 to 45 budgeted positions. As summarized in Table 11, from 44% to 95% of each unit's positions were designated for registered nurses. Units with fewer registered nurse positions were found to have a higher percentage of elderly patients ($r = -.59$, $p < .01$).

Vacancies

The percent of budgeted positions that were vacant ranged among the units from 0 to 25%. Units with higher vacancy rates were found to have higher turnover rates among staff ($r = .84$, $p < .001$) and higher percentages of patients who were 65 years or older ($r = .55$, $p < .01$). On a daily basis, all units reassigned staff to and obtained staff from other units to supplement deficits. Of the 20 units, 9 used staff from external agencies.
Table 11. Nursing Unit Census and Staffing Characteristics (n = 20)

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>MEAN</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Beds</td>
<td>38</td>
<td>8</td>
<td>22 - 52</td>
</tr>
<tr>
<td>Average Daily Census</td>
<td>31</td>
<td>7</td>
<td>19 - 44</td>
</tr>
<tr>
<td>Occupancy</td>
<td>81%</td>
<td>8%</td>
<td>67 - 97%</td>
</tr>
<tr>
<td>% of Patients ≥ 65 Years Old</td>
<td>60%</td>
<td>16%</td>
<td>25 - 85%</td>
</tr>
<tr>
<td># FTE</td>
<td>34.87</td>
<td>7.76</td>
<td>18.5 - 45</td>
</tr>
<tr>
<td>% of Positions Vacant</td>
<td>5%</td>
<td>7%</td>
<td>0 - 25%</td>
</tr>
<tr>
<td>RN Mix</td>
<td>72%</td>
<td>13%</td>
<td>44 - 95%</td>
</tr>
<tr>
<td>Staff Turnover</td>
<td>14%</td>
<td>11%</td>
<td>3 - 44%</td>
</tr>
</tbody>
</table>

FTE = # of budgeted staff positions in terms of Full Time Equivalents.

RN mix = # registered nurse positions / #FTE.

Staff Turnover = # staff positions resigned, transferred or terminated in last year/ #FTE.
Approach to Practice

The approach to nursing practice, also referred to as the method of patient care delivery, was derived by asking the head nurses to choose the model that best fit their unit: functional nursing, team nursing, primary nursing or total patient care. As diagramed in Figure 4, primary nursing and total patient care were the approaches used by three-fourths of the sample. The other five units used team nursing.

Figure 4. Approach to Nursing Practice Taken By Nursing Units (n=20)

![Pie chart showing distribution of nursing approaches]

- Total Patient Care: 40% (8 units)
- Primary Nursing: 35% (7 units)
- Team Nursing: 25% (5 units)

Note. Functional nursing was not used by any of the units in this sample.
The approach to practice was not found to be related to staffing resources or the average daily census of the units. The units with the lowest percentage of RNs were included among the units whose approach to practice was designated as total patient care or primary nursing.

Criteria Used to Evaluate Unit Effectiveness

Each OAI contained a question that asked respondents to rank five criteria as to their level of importance in determining how effective a unit performs its work. The criteria listed were: patient satisfaction, staff satisfaction, physician satisfaction, quality of documentation, and ability to function within the boundaries of a unit’s budget.

For this study’s sample of 188 head nurse and staff respondents, there was little agreement on the ranking of these criteria beyond what they saw as being the most important criteria. The criteria listed most frequently, by 129 of the respondents, as the most important criteria, was patient satisfaction.
Review of the data aggregated by unit, when compared with the responses of the entire sample of head nurses and staff, revealed a similar pattern of responses. The mean ranking of the criteria within 17 of the 20 units, placed patient satisfaction as the most important criteria for evaluating unit effectiveness. Of the remaining three units, two units ranked the unit’s ability to function within budget as being equally important to patient satisfaction. In the third unit, budget was ranked as most important followed by patient satisfaction as second most important.

Characteristics of Head Nurse Participants

Education

Four-fifths of the head nurses entered nursing through diploma or associate degree programs. Most of the head nurses had also obtained additional education in other disciplines. Of the 20 head nurses, 11 had obtained bachelor degrees and 6 had acquired master degrees in other disciplines. Only one head nurse had a Master of Science Degree in Nursing.
Work Experience

As presented in Table 12, the 20 head nurse participants averaged 10 years or more of experience in medical surgical nursing, management, and in working at their present hospitals. Only one head nurse had less than four years of experience with medical surgical patients. The same head nurse was one of two head nurses who had less than a year of experience as the managers of their current units.
Table 12.

Work Experience of Head Nurse Participants.

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>MEAN (years)</th>
<th>MEDIAN</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Surgical Nursing Experience</td>
<td>16.88</td>
<td>19</td>
<td>9.64</td>
<td>1-30</td>
</tr>
<tr>
<td>Management Experience</td>
<td>9.99</td>
<td>8</td>
<td>7.76</td>
<td>.5-25</td>
</tr>
<tr>
<td>Years Worked at This Hospital</td>
<td>12.48</td>
<td>10.5</td>
<td>9.89</td>
<td>.5-30</td>
</tr>
<tr>
<td>Years Worked on This Unit</td>
<td>5.82</td>
<td>5.5</td>
<td>4.66</td>
<td>.5-16</td>
</tr>
<tr>
<td>Years Worked as Manager on This Unit</td>
<td>5.04</td>
<td>3.75</td>
<td>4.76</td>
<td>.5-16</td>
</tr>
</tbody>
</table>
Characteristics of Staff Nurse Participants

Education

The staff participants' nursing education was similar to that of the head nurses. As portrayed in Figure 5, staff nurses were educated in nursing primarily through diploma or associate degree programs. Unlike the head nurses, very few had obtained additional education. Only one participant had a master's degree, and it was not in nursing.

Figure 5. Nursing Education of Staff Nurse Participants

- Diploma/ADN 72%
- BSN 28%
Work Experience

As depicted in Table 13, the average staff nurse respondent was employed on his/her unit for approximately four years and had experience in nursing beyond experience acquired with medical surgical patients.

<table>
<thead>
<tr>
<th>TYPE OF EXPERIENCE</th>
<th>MEAN (years)</th>
<th>MEDIAN</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing</td>
<td>9</td>
<td>6</td>
<td>8.25</td>
<td>.25-38</td>
</tr>
<tr>
<td>Medical Surgical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing</td>
<td>7.8</td>
<td>5</td>
<td>7.03</td>
<td>.25-33</td>
</tr>
<tr>
<td>Employed on Unit</td>
<td>3.95</td>
<td>4</td>
<td>2.46</td>
<td>.25-30</td>
</tr>
</tbody>
</table>

Staff nurse work experience by unit.

Unit by unit the average number of years of medical surgical experience exceeded the average length of employment on the unit. The range of mean scores for the
units, however, was quite broad. The standard deviations of the unit scores reflected great variability within the units with respect to individual staff experience (see Table 14).

Table 14.
Unit Scores for Staff Nurse Work Experiences (n=20).

<table>
<thead>
<tr>
<th>EXPERIENCE OF UNIT STAFF</th>
<th>MEAN (years)</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURSING</td>
<td>9</td>
<td>7.9</td>
<td>4.1-13.7</td>
</tr>
<tr>
<td>Medical Surgical Nursing</td>
<td>7.8</td>
<td>6.7</td>
<td>3.6-14.7</td>
</tr>
<tr>
<td>Employed on Unit</td>
<td>4.1</td>
<td>3.6</td>
<td>2.2-7.8</td>
</tr>
</tbody>
</table>

Characteristics of Patient Participants

The demographic information collected on each of the 200 patients included gender, race, age, length of stay, admitting medical diagnoses and a listing of the admitting nursing diagnoses. To analyze this information,
frequencies and percentages were calculated. For the interval level data which included age, length of stay, and number of nursing diagnoses, one way analysis of variance by unit was performed. The presentation that follows begins by summarizing age, gender and race. Information on the medical diagnoses and length of stay follows. This section concludes with a summary of the information obtained about the patients' nursing diagnoses. Each subsection begins with an overview of the entire sample and follows with a comparison to the profile of the individual units, each of which provided 10 patient participants.

Age, Sex and Race

The 200 patient participants ranged from 65 to 92 years of age. The ratio of males to females was 2:3. Distribution by race included 77% white, 22% black, and one patient classified as "other". This ratio of males to females and distribution by race, were not found to differ from the city's demographics as reported by the U.S. Census Bureau (1990).
Age, sex race by unit.

To analyze the data for age differences across units, one way analysis of variance was applied to the unit scores for patient participant age. These scores were calculated by averaging the values obtained from the 10 patient participants per unit. Significant differences across units were found in terms of the mean age of their patient participants ($F=2.18$, $df=19/180$, $p<.01$). Tukey's HSD test was then used to determine the unit means between which significant differences existed. Differences in patient age were found to involve four units. Unit 10 with a mean patient participant age of 67.1, differed significantly ($p<.05$) from unit nineteen (mean age = 77.1), and unit seven (mean age 79.4). Unit seven also differed significantly ($p<.05$) from unit nine, which had a mean patient age of 68.9.

Differences also appeared between units in the distribution of patient participants by gender and race. The percent of male patient participants ranged by unit from 30% to 80%. The percentage of patient participants, who were white versus black and other, ranged from 100% to 50%, with 5 units having only white patient participants.
Medical Diagnoses and Length of Stay

There were a total of 123 different terms used by the physicians to describe their reasons for admitting this study's patient participants to the hospital. Terminology that did not define the use of invasive procedures was coded as a medical versus surgical diagnoses. Of the 200 patient participants, 71% were admitted with medical versus surgical diagnoses. Comparison between units however revealed that the percent of patients admitted with medical versus surgical diagnoses ranged from 100% to 30% with half of the units having 9 or 10 of their participants admitted with medical diagnoses.

The length of hospital stay for the patient participants did not differ significantly across units (F= .82, df=19/180, p=.68). The mean length of stay for all of the patient participants was 7.3 days. The range in length of individual stays was quite broad, extending from 2 to 60 days. The median was 6 days and the mode, applicable to only 14 patients, was 4 days.

Nursing Diagnoses

Of the 85 nursing diagnoses listed in the NDI, 75 were each identified as being appropriate for at least 1
of the 200 patient participants. Only 22 of the 75 nursing diagnoses identified were applicable to 10 (5%) or more of the patient participants. These 22 nursing diagnoses and the frequency of their occurrence are listed in Table 15.

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Frequency</th>
<th>Nursing Diagnoses</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain related to ...agents</td>
<td>83</td>
<td>High Risk for Trauma</td>
<td>32</td>
</tr>
<tr>
<td>Impaired Mobility</td>
<td>81</td>
<td>Ineffective Breathing Pattern</td>
<td>32</td>
</tr>
<tr>
<td>High Risk for Infection</td>
<td>77</td>
<td>Decreased Cardiac Output</td>
<td>29</td>
</tr>
<tr>
<td>Altered Tissue Perfusion</td>
<td>75</td>
<td>Impaired Tissue Integrity</td>
<td>26</td>
</tr>
<tr>
<td>Self Care Deficits</td>
<td>67</td>
<td>Impaired Home Maintenance Management</td>
<td>24</td>
</tr>
<tr>
<td>Fatigue</td>
<td>65</td>
<td>Fluid Volume Deficit</td>
<td>21</td>
</tr>
<tr>
<td>Sensory- Perceptual Alteration</td>
<td>62</td>
<td>Altered Patterns in Urinary Elimination</td>
<td>18</td>
</tr>
<tr>
<td>Altered Nutrition (&lt; body requirements)</td>
<td>58</td>
<td>Anxiety</td>
<td>15</td>
</tr>
<tr>
<td>Knowledge Deficit</td>
<td>51</td>
<td>Chronic Pain</td>
<td>14</td>
</tr>
<tr>
<td>Altered Health Maintenance</td>
<td>47</td>
<td>Altered Nutrition (&gt; body requirements)</td>
<td>12</td>
</tr>
<tr>
<td>High Risk for Impaired Skin Integrity</td>
<td>44</td>
<td>Fluid Volume Excess</td>
<td>12</td>
</tr>
<tr>
<td>Activity Intolerance</td>
<td>42</td>
<td>Altered Family Process</td>
<td>11</td>
</tr>
<tr>
<td>Fluid Volume Deficit</td>
<td>38</td>
<td>Anticipatory Grieving</td>
<td>10</td>
</tr>
</tbody>
</table>
The number of nursing diagnoses per patient across units ranged from 1 to 28, with a mean of 7 and standard deviation of 5. The median number per patient was 5 nursing diagnoses. The mode was 3 nursing diagnoses.

**Average number of nursing diagnoses by unit.**

One way analysis of variance was applied to the unit data for the number of nursing diagnoses per patient participant. These scores were calculated by averaging the values obtained from the 10 patient participants per unit. Significant differences across units was found in terms of the units' mean number of nursing diagnoses per patient ($F=4.06$, $df=19/180$, $p<.001$). Tukey's HSD test was then used to determine the unit means between which significant differences existed. It was found that unit eight with an average of 12 diagnoses per patient differed significantly ($p<.05$) from 9 other units. The average number of diagnoses per patient for the 9 other units ranged from 4 to 5 diagnoses per patient.
Measurement of the Independent and Dependent Variables

This portion of the chapter summarizes the measurements taken of: 1) the independent variables including nursing unit work variability and difficulty, and structure in terms of standardization, specialization and distribution of authority to staff; 2) the covariate which consisted of the functional health of each unit’s patients on admission; and 3) the dependent variable, which was the functional health of each unit’s patients at discharge. A summary of the independent variables will be followed by an overview of the data collected on the covariate and dependent variable. Correlations between the dependent variable and the patient demographics will be included. Each subsection will start by summarizing the data across all participants and progress to analyzing for differences between units.

Nursing Unit Work and Structure Variables

The independent variables for this study consisted of the work and structural characteristics of the nursing units. These variables were measured by aggregating head nurse and staff responses to specific subscales contained in the OAI. To calculate summary statistics and perform
analysis of variance, the file of data created by joining the unweighted head nurse responses (n=20) with the staff nurse responses (n=169) was used.

The frequency distributions for each independent variable appeared normally distributed. This appearance was supported by the equivalent values found for the medians and modes and their closeness in value to the means.

The data indicated that the participants, in general, saw their work as being somewhat repetitive with only a low-moderate amount of variability. In approaching their work, the nurse participants reported that they were generally able to identify their patients needs and outcomes with a low-moderate amount of difficulty. The nurse participants indicated that the staff had a moderate amount of authority in decision making with regard to their unit’s rules, polices and performance criteria. The nurse participants also indicated that there was a moderate-high degree of functional differentiation in their individual work roles and in the degree in which their approach to patient care was driven by specified rules and operating procedures.
Table 16.
Summary Statistics for the Independent Variables (n=189).

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN</th>
<th>MEDIAN</th>
<th>MODE</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variability</td>
<td>2.36</td>
<td>2</td>
<td>2</td>
<td>.68</td>
<td>1-5</td>
</tr>
<tr>
<td>Difficulty</td>
<td>2.26</td>
<td>2</td>
<td>2</td>
<td>.67</td>
<td>1-5</td>
</tr>
<tr>
<td>Standardization</td>
<td>3.91</td>
<td>4</td>
<td>4</td>
<td>.53</td>
<td>2-5</td>
</tr>
<tr>
<td>Specialization</td>
<td>4.07</td>
<td>4</td>
<td>4</td>
<td>.52</td>
<td>2-5</td>
</tr>
<tr>
<td>Distribution of authority</td>
<td>3.23</td>
<td>3.33</td>
<td>3.33</td>
<td>.7</td>
<td>1-5</td>
</tr>
</tbody>
</table>

Work and structural characteristics by unit.

Comparison of the nursing units in terms of their work and structural characteristics was accomplished by using one way analysis of variance. Each characteristic served as the dependent variable and the nursing unit served as the independent variable. The file of data containing the unweighted head nurse responses (n=20) combined with the staff responses (n=169) was used for
this procedure.

As outlined in Table 17, statistically significant (p<.001) differences across units were only found in terms of the units' mean scores for work variability. Tukey's HSD test was used to determine the unit means between which significant differences existed. Two units were found to differ significantly from other units. It was found that unit eight with a mean score for work variability of 3, differed significantly (p<.05) from unit three (mean = 1.72), and unit seventeen (mean = 1.89). Unit three was also found to differ significantly (p<=.05) from unit fifteen (mean=2.83).
Table 17. Comparison of Nursing Units on All Independent Variables Using One Way Analysis of Variance

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN SQUARE BETWEEN GROUPS df</th>
<th>MEAN SQUARE WITHIN GROUPS df</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variability</td>
<td>19.6</td>
<td>69.82</td>
<td>2.5</td>
<td>.001</td>
</tr>
<tr>
<td>Difficulty</td>
<td>7.31</td>
<td>46.68</td>
<td>1.38</td>
<td>.144</td>
</tr>
<tr>
<td>Standardization</td>
<td>5.52</td>
<td>46.48</td>
<td>1.03</td>
<td>.428</td>
</tr>
<tr>
<td>Specialization</td>
<td>6.11</td>
<td>44.45</td>
<td>1.19</td>
<td>.269</td>
</tr>
<tr>
<td>Distribution of Authority</td>
<td>10.04</td>
<td>81.34</td>
<td>1.09</td>
<td>.37</td>
</tr>
</tbody>
</table>
The units were not equivalent in terms of their number of participants. The homogeneity of variance within the units was therefore evaluated by calculating Cochran's test statistic. The degree of heterogeneity was not significant (\(C=.099, \text{df}=11, p>.05\)).

**Functional Health Variables**

The dependent variable for this study consisted of the functional health of each nursing unit's elders at discharge. The functional health of the patients on admission was used as a covariate. As depicted in Table 18, the patient functional health scores on admission and at discharge were negatively skewed. To determine whether the skewness values differed significantly from zero, \(Z\) scores were calculated for the skewness values. The skewness \(Z\) scores for both distributions exceeded ± 2.58. As suggested by Tabachnick and Fidell (1983), the \(Z\) scores led to rejection of the normality assumption for both distributions (\(p \leq .01\)). This then led to the use of the medians in identifying the level of functional health of a typical patient participant.

The data were interpreted as indicating that the typical patient participant was admitted with a functional health score of 24 (scale 0-26) and went home declining to a score of 21 (see Table 18). Of the 200 patient participants, 103 (52\%) experienced a decline in
functional health, 55 patients (27%) remained the same and 42 patients (21%) improved.

The patients who declined in functional health did not differ from the entire sample on admission. The median functional health score for both groups was 24. The patients who declined in functional health, in comparison with the entire sample, were found however to generally have lower scores at discharge (Refer to Table 19). The patients who declined were discharged with an average score of 19.
Table 18
Functional Health of Patient Participants on Admission and at Discharge (n=200)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN</th>
<th>MEDIAN</th>
<th>MODE</th>
<th>SD</th>
<th>SKEW</th>
<th>SE</th>
<th>Z</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUNCTIONAL HEALTH ON ADMISSION</td>
<td>21.6</td>
<td>24</td>
<td>26</td>
<td>5.22</td>
<td>-1.53</td>
<td>.17</td>
<td>-9</td>
<td>0-26</td>
</tr>
<tr>
<td>FUNCTIONAL HEALTH AT DISCHARGE</td>
<td>20.1</td>
<td>21</td>
<td>26</td>
<td>4.74</td>
<td>-.83</td>
<td>.17</td>
<td>-4.88</td>
<td>4-26</td>
</tr>
</tbody>
</table>
Table 19

Functional Health on Admission and at Discharge of Patients Who Experienced a Decline in Functional Health (n=103)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN</th>
<th>MEDIAN</th>
<th>MODE</th>
<th>SD</th>
<th>SKEW</th>
<th>SKEW SE</th>
<th>SKEW Z</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUNCTIONAL HEALTH ON ADMISSION</td>
<td>23.2</td>
<td>24</td>
<td>26</td>
<td>3.48</td>
<td>-1.76</td>
<td>.24</td>
<td></td>
<td>9-26</td>
</tr>
<tr>
<td>FUNCTIONAL HEALTH AT DISCHARGE</td>
<td>18.6</td>
<td>19</td>
<td>19</td>
<td>4.15</td>
<td>-.69</td>
<td>.24</td>
<td></td>
<td>7-26</td>
</tr>
</tbody>
</table>
The functional health scores on admission were found to differ significantly from the discharge scores for the entire sample (t = 4.9, df = 199, p < .001), and for the 103 patients who declined in functional health (t = 13.85, df = 102, p < .001). This led to the identification of the functional items that changed between admission and discharge. Appendix N contains graphs (Figure 6 and Figure 7) portraying the number of patients who declined, maintained or improved in their ability to perform each activity.

The greatest change occurred in the IADL versus the ADL items. Within the ADL items, fewer than 30 patients changed on any given ADL item and the number of patients declining on their ability to perform any of the ADL items nearly equaled the number who improved. For the patients who improved and for those who declined in ADL, bathing, walking, and the ability to get out of bed activities changed the most often.

In terms of the IADL items, decline occurred most frequently in terms of their ability to shop, clean, cook and be transported. More than half of those who eventually declined in functional health had on admission to the hospital, the ability to perform the preceding activities unassisted. At discharge, the patients who declined, typically found that they were unable to shop or
clean their homes and that they needed assistance to cook and be transported (see Table 20, Appendix N).

Because of the high level of functional health exhibited by this sample of patients on admission, the difference in decline between IADL and ADL activities was anticipated. The hierarchical relationship that generally exists between IADL and ADL led to the anticipation that the highest rate of decline would occur in the IADL items.

**Correlation of functional health with demographic variables.**

Of the patient demographics (age, race, length of stay and total number of nursing diagnoses) significant correlations were only found between functional health, length of stay and the total number of nursing diagnoses. An increase in the number of nursing diagnoses was associated with lower functional health scores on admission (n=200, r=−.55, p<.001), and at discharge (n=200, r=−.37, p<.001). Patients with lower functional health scores at discharge were also found to have longer lengths of stay (r=−.22, p<.001).

**Differences in functional health between units.**

A comparison of the nursing units in terms of their patients’ functional health on admission and at discharge was accomplished by using one way analysis of variance. Functional health served as a dependent variable and the
nursing unit served as the independent variable. As outlined in Table 21, statistically significant (p<.001) differences across units were found in terms of the units' mean scores for both measures of functional health. Tukey's HSD test was then used to determine the unit means between which significant differences existed.
Table 21.
Comparison of Nursing Units on Functional Health Measures
Using One Way Analysis of Variance.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN SQUARE BETWEEN GROUPS *</th>
<th>df</th>
<th>MEAN SQUARE WITHIN GROUPS</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional Health on Admission</td>
<td>1466.48</td>
<td>19</td>
<td>3952.4</td>
<td>180</td>
<td>3.51</td>
<td>.000</td>
</tr>
<tr>
<td>Functional Health at Discharge</td>
<td>932.3</td>
<td>19</td>
<td>3538.9</td>
<td>180</td>
<td>2.5</td>
<td>.001</td>
</tr>
</tbody>
</table>
In terms of admission functional health scores, only one unit was found to differ significantly from other units. Unit thirteen with a mean score of 14.5, differed significantly (p<.05) from 11 other units. The mean scores for the 11 other units ranged from 22.4 to 25.1.3. The 9 remaining units, that were not found to differ from any of the units, had mean functional health on admission scores that ranged from 17.8 - 21.5.

In terms of discharge functional health scores, unit thirteen was no longer found to differ from other units. The functional health of unit thirteen's patients, although low on admission, did not change from admission to discharge (see Figure 8, Appendix N). Units four and nine, however, underwent noticeable decline.
Tests of the Hypotheses

This section of chapter four presents the results obtained in testing the three hypotheses. Each of the three hypotheses is presented in a separate subsection that begins by stating the hypotheses and statistical findings. A brief discussion of power and issues that may have had an impact on the level of significance follows.

Hypothesis I. On a nursing unit as the work variability increases and staff specialization decreases, there will be an associated increase in the functional health of the unit's elderly patients.

The hierarchical regression analysis performed on the data from this study's sample did not provide support for Hypothesis I ($R^2 = .31$, $F = 2.34$, $p = .11$). Table 22 shows the changes that occurred in $R^2$ as variables were added to the equation (refer to Appendix O, Table 23, for the regression coefficients and t values). A noteworthy finding was that staff specialization increased $R^2$ by .1. Work variability, which was entered into the equation before staff specialization, increase in $R^2$ by only .03 (see Table 22).

Based on the task contingent model, as work variability increased staff specialization was expected to decrease. The correlation ($r = .08$) between the two independent variables was surprisingly low and did not
portray the symmetrical inverse relationship expected between the independent variables (see Table 24). Only 4 units were found to have a symmetrical inverse relationship between their measures of work variability and staff specialization. The functional health of the patients on the four units declined between admission and discharge and did not differ from the other units. This finding suggested that a symmetrical inverse relationship between the two independent variables was not related to functional health at discharge. The correlation between staff specialization and functional health at discharge (r=-.35, p=.06) did, however, suggest an inverse relationship between these variables.

The data for Hypothesis I were further analyzed to determine if the assumptions for multiple regression had been violated. The low correlations between the independent variables revealed an absence of multicollinearity. Next, the residuals were examined for normality. No outlier or other indications for manipulation of the data were found. The standardized residuals were then plotted against the predicted scores and the independent variables. The plots portrayed the low variance found across units in the independent variables.
Table 22.
Functional Health at Discharge (FHD) as the Dependent Variable, Functional Health on Admission (FHA) as the Covariate and Work Variability (VAR) and Staff Specialization (SPECIAL) as the Independent Variables.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>BETA</th>
<th>R²</th>
<th>ADJUSTED R²</th>
<th>F*</th>
<th>F SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHA</td>
<td>.31</td>
<td>.18</td>
<td>.13</td>
<td>3.88</td>
<td>.06</td>
</tr>
<tr>
<td>VAR</td>
<td>.23</td>
<td>.21</td>
<td>.12</td>
<td>2.26</td>
<td>.14</td>
</tr>
<tr>
<td>SPECIAL</td>
<td>-.32</td>
<td>.31</td>
<td>.17</td>
<td>2.34</td>
<td>.11</td>
</tr>
</tbody>
</table>

* F denotes the value of F obtained after this variable was added to equation.
Table 24.
The Correlations Between Functional Health on Admission (FHA), Functional Health at Discharge (FHD), Work Variability (VAR), and Staff Specialization (SPECIAL) (n=20).

<table>
<thead>
<tr>
<th></th>
<th>FHA</th>
<th>FHD</th>
<th>VAR</th>
<th>SPECIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHA</td>
<td>-</td>
<td>.42</td>
<td>.25</td>
<td>-.17</td>
</tr>
<tr>
<td>FHD</td>
<td>-</td>
<td></td>
<td>.28</td>
<td>-.35</td>
</tr>
<tr>
<td>VAR</td>
<td>-</td>
<td></td>
<td></td>
<td>.08</td>
</tr>
<tr>
<td>SPECIAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Power analysis.**

Using Cohen's (1988) power table (a = .05), the F test for Hypothesis I was found to have a power of .49 (multiple $R^2 = .31$, $f^2 = .45$, u=3, v = 16, n = 20, noncentrality parameter = 8.99). The low power found in the F test of Hypothesis I was undoubtedly influence by the unexpected restricted variance found in the units in terms of their staff specialization. The restricted variance increased the size of the standard error and, thereby, made statistical significance at $\alpha$ at .05 more difficult to achieve. With the preceding in mind, functional health
on admission and staff specialization were identified as important variables to consider in relation to functional health at discharge. The merit of entering work variability into the equation, however, appeared questionable and will be discussed further in chapter five.

Hypothesis II. On a nursing unit as the work variability increases and standardization decreases, there will be an associated increase in the functional health of the unit’s elderly patients.

The hierarchical regression analysis performed on the data from this study’s sample did not provide support for Hypotheses II. As listed in Table 25, work variability and standardization for this sample of units did not account for the variance found in the discharge functional health status of the units’ elderly patients ($R^2=.22$, $F=1.54$, $p=.25$) (refer to Appendix 0, Table 26 for regression coefficients and t values).

As found in Hypothesis I, the patients’ functional health on admission accounted for approximately 18% of the variance found in the patients’ functional health at discharge. Unlike staff specialization, in Hypothesis I, unit structure in terms of standardization, increased $R^2$ by only .02.
Based on the task contingent model as work variability increased, standardization was expected to decrease. As found in testing Hypothesis I, the relationship hypothesized by the task contingent model between work variability and unit structure was not found. The low correlation \( r = -0.22 \) between work variability and specialization did not portray the relationship expected between the two independent variables (see Table 27).

Only two units were found to have a congruent relationship between their degree of work variability and staff standardization. The functional health of the patients on the two units declined between admission and discharge and did not differ from the other units.

The data for Hypothesis II were further analyzed to determine if the assumptions for multiple regression had been violated. The correlation matrix in Table 27 revealed an absence of multicollinearity. Next, the residuals were examined for normality. No outlier or other indications for manipulation of the data were found. The standardized residuals were then plotted against the predicted scores and the independent variables. As found with Hypothesis I, the plots portrayed restricted variance in the independent variables.
Table 25.

Functional Health at Discharge (FHD) as the Dependent Variable, Functional Health on Admission (FHA) as the Covariate, and Work Variability (VAR) and Standardization (STANDARD) as The Independent Variables.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>BETA</th>
<th>R^2</th>
<th>ADJUSTED R^2</th>
<th>F*</th>
<th>F SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHA</td>
<td>.34</td>
<td>.18</td>
<td>.13</td>
<td>3.88</td>
<td>.06</td>
</tr>
<tr>
<td>VAR</td>
<td>.22</td>
<td>.21</td>
<td>.12</td>
<td>2.26</td>
<td>.14</td>
</tr>
<tr>
<td>STANDARD</td>
<td>.13</td>
<td>.23</td>
<td>.08</td>
<td>1.54</td>
<td>.24</td>
</tr>
</tbody>
</table>

* F denotes the value of F obtained after this variable was added to equation.

Table 27.

The Correlations Between Functional Health on Admission (FHA), Functional Health at Discharge (FHD), Work Variability (VAR), and Standardization (STANDARD) (n=20).

<table>
<thead>
<tr>
<th></th>
<th>FHA</th>
<th>FHD</th>
<th>VAR</th>
<th>STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHA</td>
<td>-</td>
<td>.42</td>
<td>.25</td>
<td>.2</td>
</tr>
<tr>
<td>FHD</td>
<td>-</td>
<td>-</td>
<td>.28</td>
<td>.14</td>
</tr>
<tr>
<td>VAR</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-.22</td>
</tr>
<tr>
<td>STANDARD</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Power analysis.

Using Cohen's (1988) power table (a = .05), the F test for Hypothesis II was found to have a power of .34 (multiple $R^2 = .22$, $f^2 = .28$, $u=3$, $v = 16$, $n = 20$, noncentrality parameter = 5.64). As found in Hypothesis I, the low power found in the F test of Hypothesis II, was undoubtedly influence by the unexpected restricted variance found in the units in terms of their degree of standardization.

Hypothesis III. On a nursing unit as the work difficulty increases and distribution of authority to staff increases, there will be an associated increase in the functional health of the unit's elderly patients.

The hierarchical regression analysis performed on the data from this study's sample did not provide support for Hypothesis III. As listed in Table 28, work difficulty and distribution of authority to staff for this sample of units did not account for the variance found in the discharge functional health status of the units' elderly patients ($R^2=.22$, $F=1.46$, $p=.26$) (refer to Appendix O, Table 29 for regression coefficients).

As found in testing Hypotheses I and II, the relationship between the independent variables was also not
as predicted by the task contingent model. The low correlation ($r = -0.02$) between work difficulty and distribution of authority to staff did not portray the symmetrical relationship expected between the two independent variables. (see Table 30).

Table 28.
Functional Health at Discharge (FHD) as the Dependent Variable, Functional Health on Admission (FHA) as the Covariate, and Work Difficulty (DIFF), and Distribution of Authority to Staff (AUTHOR) as the Independent Variables.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>BETA</th>
<th>$R^2$</th>
<th>ADJUSTED $R^2$</th>
<th>F*</th>
<th>F SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHA</td>
<td>.42</td>
<td>.18</td>
<td>.13</td>
<td>3.88</td>
<td>.06</td>
</tr>
<tr>
<td>DIFF</td>
<td>.19</td>
<td>.21</td>
<td>.12</td>
<td>2.29</td>
<td>.13</td>
</tr>
<tr>
<td>AUTHOR</td>
<td>-.06</td>
<td>.22</td>
<td>.07</td>
<td>1.46</td>
<td>.26</td>
</tr>
</tbody>
</table>

* F denotes the value of F obtained after this variable was added to equation.
The data for Hypothesis III were further analyzed to determine if the assumptions for multiple regression had been violated. The correlation matrix in Table 30 revealed an absence of multicollinearity. Next, the residuals, were examined for normality. No outlier or other indications for manipulation of the data were found. The standardized residuals were then plotted against the predicted scores and the independent variables. As found with the other two hypotheses, the plots portrayed restricted variance in the independent variables.

Table 30.
The Correlations Between Functional Health on Admission (FHA), Functional Health at Discharge (FHD), Work Difficulty (DIFF), and Distribution of Authority to staff (AUTHOR), (n=20).

<table>
<thead>
<tr>
<th></th>
<th>FHA</th>
<th>FHD</th>
<th>DIFF</th>
<th>AUTHOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHA</td>
<td></td>
<td>.42</td>
<td>.04</td>
<td>-.01</td>
</tr>
<tr>
<td>FHD</td>
<td>-.42</td>
<td></td>
<td>.21</td>
<td>.13</td>
</tr>
<tr>
<td>DIFF</td>
<td>-.04</td>
<td>-.21</td>
<td></td>
<td>-.02</td>
</tr>
<tr>
<td>AUTHOR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Power analysis.

Using Cohen's (1988) power table (a = .05), the F test for Hypothesis III was found to have a power of .34 (multiple $R^2 = .22$, $f^2 = .28$, $u=3$, $v = 16$, $n = 20$, noncentrality parameter = 5.64). As found in the other two hypotheses, the low power found in the F test of Hypothesis III, was undoubtedly influence by the unexpected restricted variance found in both independent variables.
CHAPTER V

Study Summary

The purpose of this study was to describe the relationship between nursing unit work and staff structure as it relates to the functional health of elderly patients. This was done to build a theoretical basis for nurse executives to assist them in creating environments that produce positive patient outcomes. Critical questions raised by nurse executives are: (a) How should nursing departments be structured? and (2) Can units be structured in a manner that produces positive patient outcomes? (Henry, Moody, Pendergast, O’Donnell, Hutchinson, & Scully, 1987).

In determining unit structure, nurse executives must match resources with the demands created by the nature of the work and requirements for increased productivity (Fine, 1983). To measure productivity, nurse executives must focus on patient outcomes (American Nurses’ Association, 1976; Joint Commission on Accreditation of hospitals, 1975).

In selecting critical patient outcomes, elderly patients emerge as a population worthy of attention. The elderly are hospitalized at a rate that is nearly four times that of the general population and their length of hospital stays are longer (Broady, 1984). Of persons age
65 or older, approximately 20% are hospitalized annually, and over one-fourth of those admitted are rehospitalized during the following year (Broady).

An important outcome for elderly patients is functional health (Brown, 1988). Function health in acutely ill elders has been found to decline before and to worsen during hospitalization (Landefeld, Palmer, Kowal, Kresevic, 1991). This course of decline has been found to reverse, however, for patients who are hospitalized on geriatric units and in relation to the goal directed behavior of nurses (Harrell, McConnell, Wildman, & Samsa, 1989; Rubenstein, Weiland, English, Josephson, Sayre & Abrass, 1984; Sloan 1989).

Many hospitals do not have geriatric care units and much of the care for the hospitalized elderly is provided on units that do not specialize in the care of elders. The numbers of hospitalized elderly patients is also expected to continuously increase so that the creation of geriatric units may not be appropriate. From this perspective, the current study focused on elders hospitalized on general medical-surgical units.

Prior to the present study, there were no published investigations that operationalized functional health in relation to nursing unit work and structural characteristics. The researchers that have focused on
functional health as an outcome of hospitalization, have not measured the structure of the nursing units. As noted by Mark (1989), suggestions in the nursing literature on ways of structuring the organization of nursing units are often written in prescriptive yet a theoretical fashion.

To fill this theoretical void prior researchers have applied task contingency theory (Alexander & Randolph, 1985; Leatt & Schneck, 1982a, 1982b; Comstock & Scott, 1977). Studies based on this framework have documented that nursing units differ in their work and structural characteristics (Leatt & Schneck; Comstock & Scott). A later investigation found that improved unit performance occurred when a unit’s structure fit the nature of its work. (Alexander & Randolph). In their study, however, patient outcomes were not measured as an indicator of unit performance.

The present study represents pioneering efforts at measuring nursing unit work and structure in relation to the patient outcome of functional health. To accomplish this aim, a theoretical framework was developed by transforming Van de Ven and Ferry’s (1980) task contingent model from King’s perspective of nursing. From this perspective, work on a nursing unit refers to effort directed at improving the functional health of the unit’s patients. According to this model, congruence between a
unit's work and its structure leads to enhanced functional health for the unit's patients. As postulated in this study's three hypotheses, the task contingent model associates specific dimensions of work to specific dimensions of structure. The hypotheses tested in this study were as follows:

1) On a nursing unit, as the variability of the work increases and staff specialization decreases, there will be an associated increase in the functional health of the unit's elderly patients.

2) On a nursing unit, as the variability of the work increases and staff standardization decreases, there will be an associated increase in the functional health of the unit's elderly patients.

3) On a nursing unit, as the difficulty of the work and distribution of authority to staff increases, there will be an associated increase in the functional health of the unit's elderly patients.

The sample of 20 nursing units for this study were obtained from 5 randomly selected hospitals of a midwestern city, 4 per hospital. For the three hospitals that had more than four units, the units with the highest percent of elderly patients were selected. To be selected a unit must have: (a) admitted patients that were 65 years or older; (b) discharged 70% of their elderly patients directly to
their homes; and (c) not be a psychiatric or specialty units that transferred patients to other units prior to discharge.

To obtain measures of the nursing units' work and structure, each unit's head nurse and selected staff completed self-administered questionnaires. To participate in this study, the staff and head nurses had to be registered nurses, work at least 32 hours per week, and have worked on their units for at least 3 months. Of the 214 staff approached for this study, 168 (78%) returned completed questionnaires.

To obtain measures of patient functional health, 200 patients were interviewed twice, once within 48 hours of admission and again within 48 hours of discharge. Included in the sample of patients were the first 10 available patients per unit who were evaluated by their assigned nurse as: age 65 or older; alert and oriented; and expected to return home upon discharge. Each patient also had to be available by phone for the second interview within 48 hours of discharge.

Analysis of data for this study included: (a) description of the data at the unit and individual participant level, including analysis of variance among the units for pertinent variables and correlation among variables and (b) tests of the models ability to explain
the functional health of hospitalized elders. To test the model, hierarchical regression was applied to the data.

The hierarchical regression analysis performed on data from this study’s sample did not provide support for the complex relationships proposed in this study’s hypotheses. The symmetrical relationships between the dimensions of work and structure as outlined by the task contingent model were infrequently observed. Secondly, low power of the F tests resulted from unexpected restricted variance found in the units in terms of their work difficulty and three structural dimensions. The restricted variance increased the size of the standard error and thereby made statistical significance at $\alpha$ at .05 more difficult to achieve. Further analysis of the findings indicated that unit structure in terms of staff specialization and the functional health of the units’ patients upon admission, may be important variables to consider in relation to the functional health of the units’ patients at discharge. Work variability, which was found to differ across units ($p<.001$), was found not to be relevant. Work variability was not correlated with the other independent variables and increased $R^2$ by only .03 ($t=1.05$, $p<.31$).

The findings from this study cast doubt on the ability of the task contingent model to predict relationships
between work, structure and patient outcomes. The next sections of this chapter will discuss the findings in relation to prior research and provide the foundation for the implications that follow.

Discussion of the Findings

The following discussion highlights this study's findings in relation to prior research and issues raised in the review of literature. Prior research on unit structure has not studied structure from a patient need or outcome perspective. Instead, structure, either on an organizational or unit level, has been related to variables such as technology, organizational size, and environment (Blau, 1970; Burns & Stalker, 1961; Child & Mansfield, 1972; Fry & Slocum, 1984; Hage & Aiken, 1969; Hall, 1962; Leatt & Schneck, 1982; Schoonhoven, 1980; Woodward, 1965). This study represents pioneering efforts at measuring nursing unit work and structure in relation to functional health.

To facilitate linkage of this discussion to theory development, the findings are first discussed in conjunction with the three hypotheses of this study. Inherent in the three hypotheses are two critical questions: (1) Is there a congruent relationship between a unit's work and structure? and (2) Does congruence between
work and structure relate to enhanced functional health? A discussion of the preceding questions through a synthesis of all findings follows the subsections for the three hypotheses. Implications from this study for nursing science are then summarized.

Hypothesis (I) On a nursing unit, as the variability of the work increases and staff specialization decreases, there will be an associated increase in the functional health of the unit's elderly patients.

The hierarchical regression analysis performed on data from this study's sample did not provide support for the preceding hypothesis. In terms of the regression equation, a noticeable increase in \( R^2 \) was obtained when the covariate, functional health on admission, and second independent variable, staff specialization, were entered. Work variability, however, which was entered as the first independent variable, did not enhance the explanatory power of the equation. Further analysis revealed that only four units had the proposed inverse symmetrical relationship between work variability and staff specialization. The four units with an inverse symmetrical relationship between their degree of work variability and staff specialization were expected to discharge elders with enhanced functional
health. The functional health scores on these units, however, declined.

The preceding findings were quite unexpected and raised the following questions: (a) Is there something unusual about the units in terms of their measures of work variability and staff specialization? and (b) Is there a possible explanation for the lack of congruence between work variability and staff specialization found on 16 units and the congruence found on the other 4 units? Additional questions included: (a) Is there a feasible explanation for the lack of explanatory power found by entering work variability in the regression equation? (b) Is there a feasible explanation for the functional decline observed when enhanced functional health was anticipated? The additional questions were also relevant to the other hypotheses in this study and will be addressed later in this discussion. The discussion presented next focuses on the measures of and the relationship between work variability and staff specialization.

Unit measures of work variability and staff specialization.

As predicted by Van de Ven and Delbecq (1974) the 20 nursing units differed in their degree of work variability (p<.001), and were found to range low-moderate to moderate in terms of the variability of their work. In terms of
staff specialization, however, the units were similar. The measures of staff specialization revealed that all 20 units were moderate-high in the degree in which they differentiated their roles according to tasks. As proposed in this study, the units with moderate degree of work variability should have had a lower degree of staff specialization.

The similarity among units in terms of their staff specialization was unexpected. The researcher anticipated and was informed by the head nurses that the units differed in terms of their approach to practice and in their percent of budgeted positions occupied by registered nurses (RNs). When the head nurses were asked to choose between primary nursing, total patient care, team nursing and functional nursing in describing which model best fit their unit approach to practice, three-fourths of the head nurses choose primary nursing or total patient care.

Review of other unit demographics, however, revealed that the units with the lowest percent of RN positions were among the units choosing total patient care. Units with lower percentages of RN positions budgeted were also found to have a higher number of vacancies requiring greater usage of supplemental staff from other units or external agencies. The use of supplemental staff and the lower percentage of RNS may have required the staff to
differentiate their assigned roles according to tasks. The need to differentiate roles by tasks was also supported by the fact that all units, regardless of their approach to practice, were staffed with a variety of nursing positions including registered nurses and licensed practical nurses. Some units also had nursing assistants and orderlies. The variety in positions and associated qualifications may have increased the degree of staff specialization and thereby diminished the staff’s ability to use a goal oriented approach typified by primary nursing and total patient care.

The relationships found between work variability and staff specialization.

An inverse symmetrical relationship between work variability and staff specialization proposed in this study’s hypothesis was unexpectedly found on only 4 out of 20 units. The lack of congruence found between the two independent variables was undoubtedly influenced by the similarity found across units in staff specialization. There was also no apparent explanation for the congruence found between the independent variables for 4 of the units. The four units were in three different hospitals and were therefore not organizationally related.

In retrospect, Van de Ven and Ferry’s (1980) task contingent model states that performance is enhanced when
units are structured according to the characteristics of their work. This model does not state that work characteristics will determine structural characteristics. With the preceding in mind, this researcher abandoned further attempts to explain the relationships found between work variability and staff specialization.

Hypothesis (II) On a nursing unit, as the variability of the work increases and standardization decreases, there will be an associated increase in the functional health of the unit's elderly patients.

The hierarchical regression analysis performed on data from this study's sample did not provide support for the preceding hypothesis. In terms of the regression equation, neither work variability or standardization enhance the explanatory power of the equation. Further analysis revealed that only two units had the proposed inverse symmetrical relationship between work variability and standardization. The two units with a congruent relationship between their degree of work variability and staff specialization were expected to discharge elders with enhanced functional health. The functional health scores on these units, however, declined.

The preceding findings were unexpected and raised the following questions: (a) Is there something unusual about
the units in terms of their measures of standardization? and (b) Is there a possible explanation for the high degree of standardization found across units? Additional questions were also relevant to the other hypotheses in this study and will be addressed in a later discussion on the synthesis of the findings. The discussion presented next focuses on the measures obtained for the units in terms of standardization.

**Standardization.**

The similarity found in this study’s sample of nursing units in terms of their degree of standardization was unexpected and undoubtedly influenced the lack of congruence found between the two independent variables. Although Alexander and Randolph’s (1985) 27 units were not found to differ in terms of standardization, earlier studies (Alexander, 1982; Comstock & Scott, 1977; Kovner, 1966) had found structural differences across their samples of nursing units. In retrospect, the preceding contradiction in findings may have been influenced by the timing of the studies.

Historically, efforts to enhance the quality of care have resulted in guidelines that standardize regimes to address specific patient concerns. Nurses have been bombarded with increasing numbers of standards from many diverse sources such as, their professional associations,
the JCHO, private and public payers, state and federal government, consumer groups and most recently the Agency for Health Policy and Research (AHCPR) (Curtin, 1992). The fact that many standards apply to nursing units across the country might explain why the nursing units were found to be similar in their degree of standardization. The increasing number of standards might also explain why the nursing units in this sample were found consistently to be moderate-high in terms of their standardization.

Standardization, as hypothesized in this study, was assumed to equate to a depersonalized task oriented approach to patient care. As recently noted by Curtin (1992), however, guidelines may standardized regimens, while interactions remain very personal. A high degree of standardization might therefore be integrated with a goal oriented approach to practice. Nurses using such an approach would view patients as individuals and the choice of regimens could be conceivably negotiated on a case by case basis with each patient based on his/her specific needs.

The lack of support found for this hypothesis suggests that the degree of standardization and work variability found on the nursing units were not related to the patients' functional health at discharge. Unlike other types of work, a variety of guidelines can be applied in
caring for patients. In other industries, where the focus of work is an inanimate object, there may be only one method that can be used to transform that object into the desired output. With the preceding differences in mind, nursing may need to deviate from the task contingent model in reference to standardization.

All units regardless of their degree of work variability may be characterized by a high degree of standardization. Standardization may also relate to patient outcomes in a manner not proposed in this study. The type of standards instead of the degree of standardization, for example, may be a more appropriate variable in relation to patient outcomes.

Hypothesis (III) On a nursing unit, as the difficulty of the work and distribution of authority to staff increases, there will be an associated increase in the functional health of the unit’s elderly patients.

The hierarchical regression performed on the data from this study did not provide support for the preceding hypothesis. Further analysis of the data, however, revealed restricted variance in both independent variables. The difficulty of the units’ work and the degree of distribution of authority to the staffs, due to their restricted variance, could not account for the variance
found in the patients' functional health at discharge.

Additional analysis also revealed that the degree of work difficulty needed to be higher to be congruent with the degree of distribution of authority given to staff. Based on Overton, Schneck and Hazeltte's (1977) findings the researcher anticipated that the degree of difficulty would be higher. As in Overton, Schneck and Hazeltte's (1977) study, the researcher anticipated that units caring for predominantly elderly patients would score relatively high in uncertainty. This expectation was also consistent with current thoughts that view the care needs of the aged as complex (Brown, 1988).

To identify possible reasons for the low degree of work difficulty found in this study's sample of units, the researcher reviewed the units' demographics. In this study, the percentage of patients 65 years or older was found to be negatively related to the units' ratio of registered nurses to other staff positions, and positively related to the number of staff vacancies. These characteristics indicate that units caring for a greater percentage of elderly patients may have been experiencing resource constraints in terms of the quantity and quality of their staffing. Such constraints may have had an impact on the staffs' ability to fully assess the needs of their elderly patients.
Discussion of finding relevant to more than one hypotheses

Synthesizing the findings across all three hypotheses cast doubts on the appropriateness of applying the task contingent model to nursing units in predicting functional health. The first problem encountered in applying this model is that congruent relationships between work and structure as proposed by the model were rarely found. Questions have also been raised by Calkin’s (1980) work as to whether such conditions can be induced experimentally.

Another problem confronted in using the model was that both of the independent variables for each hypothesis were expected to be pertinent in explaining the variance found in the functional health of the units’ patients at discharge. The impact of the structural dimension may have been influenced by the structural similarities of the units. The units differed, however, in terms of their degree of work variability.

Alexander and Randolph’s (1985) work supported the expectation that work variability would be a relevant variable. As previously presented, Alexander and Randolph (1985) found that the technology dimensions (variability, uncertainty and instability) taken alone made a significant (p<.01) contribution to the quality of care.

A difference between Alexander and Randolph’s (1985) study and this study concerned the measurement of unit
effectiveness. Alexander's study measured the quality of nursing process while this study evaluated functional health at discharge as a patient outcome. This difference may explain why work variability was found to be a relevant variable in Alexander's study and not in the present study. For this study, the use of process as an outcome is contradictory to task contingent model and King's (1981) description of the patient-environment interaction. The task contingent model, according to Van de Ven and Ferry (1980), places process as an antecedent to performance.

Within the framework of the task contingent model, a variety of options exist for evaluating unit performance. Effectiveness could be evaluated for example, in terms of profitability or staff satisfaction. From a nursing perspective, however, the quality of patient outcomes take priority as a measure of unit performance. From King's (1981) perspective, process is also an antecedent to performance and the patient's health is the outcome of interest.

The approach taken by this study in evaluating unit performance in terms of a patient outcome may be a crucial issue in relation to the inconsistencies and lack of support found in this study for the task contingent model. The variables of standardization and specialization, may for example, relate to patients in a manner that is
independent of the units' work characteristics and that differs from other raw materials. Unlike inanimate objects and related outcomes, enhanced functional health occurs through goal directed interactions between the patient and nurse (King, 1980). This form of interaction according to King (1980) is necessary for the nurse to have an impact on the patient's health. When units are characterized as found in this study, with a high degree of staff specialization, staff roles are differentiated by functions and focus on tasks (Alexander, 1982). In retrospect, this would appear to be inconsistent with the goal directed interactions prescribed by King. When staff are goal directed, they are all concerned with a complete array of tasks and focus on patients on a case by case basis (Alexander). To be goal directed, nursing units may need a lower degree of staff specialization regardless of the degree of work variability.

Limitations

Efforts were invested in this study to benefit from the experience of prior researchers and thereby avoid the methodological limitations experienced by them. Many of the problems experienced by prior researchers related to their inadequate or lack of measurement of pertinent variables. In this study, the units' work and structural
characteristics and the patients' functional health were all measured with established instruments.

This study was limited primarily by the number of hospitals and nursing units sampled. An increase in the sample size would have increased the power of the F test for all three hypotheses and provided a source of confirmation for the study's conclusion. The 20 nursing units chosen for the present study were from 5 hospitals and were representative of the nursing units found in a particular city. To obtain additional units would require contact with additional hospitals in other cities and require a substantial financial investment.

Implications for Nursing Science

This study represents pioneering efforts at measuring nursing unit work and structure in relation to the patient outcome of functional health. The significance of the present study lies in its contribution to theory development for nursing science and nursing administration. First, this study provides insight into the applicability of the task contingent model in predicting patient outcomes. Alternative ways of viewing three dimensions of structure in relation to patient outcomes are also proposed. Secondly, the study reaffirms the importance of measuring functional health as a patient outcome.
The applicability of the task contingent model and proposed alternatives.

For more than a decade, contingency theory has been proposed as a viable framework for research in nursing administration on the relationships between organizational technology, structure and effectiveness (Mark, 1989). Researchers have used contingency theory to study the relationship between nursing unit work and structure (Comstock & Scott, 1977; Leatt & Schneck 1982a). Contingency theory was later applied to a congruent relationship between the work and structural characteristics of nursing units to the quality of nursing process (Alexander & Randolph 1985). Unlike prior research in relation to contingency theory, this study transformed the theory from a nursing perspective and used the functional health of elderly patients as an indicator of unit performance.

In using a nursing perspective to transform the task contingent model, the focus of work became patients and the indicator of unit performance became functional health. By applying a nursing perspective, the alteration made in the task contingent model was to specify the functional health of patients as an indicator of unit performance. The approach of viewing the raw materials of work as patients, was within the boundaries of the task contingent model.
Perrow (1967), who originally conceptualized the factors found in the task contingent model, specified that the raw materials of work could be people, symbols, or things.

The findings from this study cast doubts on the appropriateness of applying the task contingent model to nursing units in predicting functional health. In retrospect, the congruent relationship hypothesized between work variability and staff specialization is not consistent with King’s theory for nursing. Prior research has shown that the functional health of elders can be enhanced through the goal directed efforts of nurses (Harrell, McConnell, Wildman, & Samsa, 1989). To be goal directed, nursing units may need a lower degree of staff specialization regardless of the degree of work variability.

The relationships proposed in the task contingent model between work variability and standardization may also lack applicability to nursing. The extent to which standards are used to prescribe regimens is not necessarily incompatible with individualized goal directed care. Standardization might also relate to patient outcomes in a manner not proposed in this study. The type of standards instead of the degree of standardization, for example, may be a more appropriate variable in relation to patient outcomes.
The relationship proposed in the model between work
difficulty and distribution of authority to staff in
relation to functional health could not be evaluated in
this study. In retrospect, future studies on this topic
may also benefit by expanding the structural dimension of
authority to evaluate the distribution of authority given
to patients. Expanding the concept of authority would
assist in identifying the extent to which nurses approach
patients as individuals in accordance with King’s (1981)
definition of person.

Functional health as a patient outcome.

The findings from this study support the need to
continue focusing on functional health as a patient outcome
and indicator of unit performance. As found in the
Landefeld, Palmer, Kowal and Kresevic (1991) study,
functional health for a substantial number of patients in
this study’s sample declined. In this study the 103
patients, who declined in functional health, were also
found to generally have longer lengths of stay. The
patients who declined, typically functioned independently
on admission, and returned to their homes in the community
requiring assistance with instrumental activities such as
transportation, shopping, cleaning and/or cooking. In
addition to possibly having detrimental affects on the
elders’ quality of life, functional decline may also result
in increased needs for assistance during hospitalization and after discharge. This increases financial costs for both the hospital and patient.

**Summary of implications.**

This study was done to build a theoretical basis for nurse executives to assist them in creating environments that produce positive patient outcomes. The findings of this study suggests that the task contingent model is not an appropriate framework for this purpose.

Future theory development should continue to focus on the link between nursing unit structural characteristics and functional health as an indicator of unit performance. Prior research has shown that the functional health of elders can be enhanced through the goal directed efforts of nurses (Harrell, McConnell, Wildman, & Samsa, 1989).

The model developed for such a theory needs to incorporate the patients' functional health on admission as a covariate. In conceptualizing the dimensions of structure, the degree of staff specialization and quality of day to day staffing resources are two variables worthy of consideration. Evaluating the types of standards used and the extent to which application is individualized may also be pertinent. As discussed, the degree of standardization does not appear to be an appropriate variable. The distribution of authority given to patients
may also be worthy of consideration.

Recommendations for Further Study

The recommendations for further study are as follows. First, descriptive studies that are based on a nursing perspective are needed to identify and carefully define the structural characteristics of nursing units. In this investigation the units' approaches to practice, as reported by the head nurses, did not necessarily reflect structural differences to the degree in which patient care was standardized or the extent to which staff roles were differentiated. Research involving unit structure must therefore incorporate actual measures of each structural dimension: standardization, specialization and distribution of authority. The measurement of unit structure can then be enhanced by also incorporating indicators of the quality and quantity of staffing resources and expanding the dimension of authority to include the authority given to patients.

Secondly, research efforts are needed to identify factors, other than the nursing unit environment, that influence functional health. Descriptive studies from a clinical focus are needed to acquire an understanding of functional decline from a patient perspective. The relationship between a patient's perceived quality of life
and measures of a decline during hospitalization need to be established. Questions currently unanswered are: What does it mean to a patient to decline from a score of 23 to 19? Is the newly acquired need for assistance anticipated? Are sufficient resources available and acceptable to elderly patients? Decline was assumed to be a negative outcome in this study and others. Testing this assumption would increase knowledge about functional health and assist with specifying appropriate interventions.

A final recommendation from this study is that future efforts in researching unit structure in relation to functional health must institute methods that will enhance the power of the F test. The effect sizes found in this study can be used to estimate the sample sizes needed for future descriptive studies. Another option would be to increase the variance of unit structural characteristics by manipulating structure on specific units.

The preceding recommendations provide direction for future exploration. Further research is needed to describe the relationship between nursing unit structure as it relates to the patient outcome of functional health. Without such research, the knowledge needed to develop practice theory cannot be obtained. Without theories to help them, nurse executives are left without the resources needed to make effective decisions about the structure of
their nursing units. Future research, such as this study's pioneering efforts, is needed to develop practice theory for nurse executives.
REFERENCES


American Nurses’ Association: Guidelines for review of nursing care at the local level. (1976). Kansas: A.N.A.


APPENDIX A

Summary of Studies Examining Unit Work and Structure
### SUMMARY OF STUDIES EXAMINING UNIT WORK (TECHNOLOGY) AND STRUCTURE

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE OF WORK UNIT</td>
<td>nursing unit</td>
<td>nursing unit</td>
<td>clinic</td>
<td>nursing units</td>
</tr>
<tr>
<td>DIMENSIONS OF WORK</td>
<td>predictability</td>
<td>uncertainty</td>
<td>difficulty</td>
<td>uncertainty</td>
</tr>
<tr>
<td></td>
<td>work flow</td>
<td>instability</td>
<td>instability</td>
<td>instability</td>
</tr>
<tr>
<td></td>
<td>complexity</td>
<td>variability</td>
<td>variability</td>
<td>variability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>formalisation</td>
<td>standardization</td>
<td>formalisation</td>
</tr>
<tr>
<td>DIMENSIONS OF STRUCTURE</td>
<td>task specialisation</td>
<td>vertical participation</td>
<td>centralisation</td>
<td>complexity and types of positions</td>
</tr>
<tr>
<td></td>
<td>task differentiation</td>
<td></td>
<td></td>
<td>decentralisation</td>
</tr>
<tr>
<td></td>
<td>ward centralisation</td>
<td></td>
<td></td>
<td>size</td>
</tr>
<tr>
<td></td>
<td>size</td>
<td>reference group structure</td>
<td></td>
<td>size</td>
</tr>
<tr>
<td></td>
<td>task interaction</td>
<td></td>
<td></td>
<td>size</td>
</tr>
<tr>
<td>OTHER VARIABLES</td>
<td>professional role orientation</td>
<td>quality of nursing care</td>
<td>unit interaction with other departments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>organisational tenure</td>
<td>staff nurse job satisfaction</td>
<td>clinical performance of staff nurses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>supervisor style</td>
<td></td>
<td></td>
<td>hospital characteristics</td>
</tr>
<tr>
<td></td>
<td>hospital complexity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>education</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>-----------------</td>
<td>--------------</td>
<td>-------------</td>
<td>--------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>TYPE OF WORK UNIT</td>
<td>library departments</td>
<td>health department</td>
<td>employment security agency offices</td>
<td>employment security agency offices</td>
</tr>
<tr>
<td>DIMENSIONS OF WORK</td>
<td>predictability</td>
<td>work groups</td>
<td>manageability</td>
<td>difficulty</td>
</tr>
<tr>
<td>routine</td>
<td>variablility</td>
<td>standardisation</td>
<td>specialisation</td>
<td>distribution of authority</td>
</tr>
<tr>
<td>DIMENSIONS OF STRUCTURE</td>
<td>rule discretion</td>
<td>participation</td>
<td>distribution of authority</td>
<td>distribution of authority</td>
</tr>
<tr>
<td>task interdependence</td>
<td>unit goal attainment</td>
<td>unit performance</td>
<td>unit service</td>
<td>unit adaptiveness</td>
</tr>
<tr>
<td>OTHER VARIABLES</td>
<td>clinical performance of staff nurses</td>
<td>unit efficiency</td>
<td>unit service</td>
<td>unit adaptiveness</td>
</tr>
</tbody>
</table>
APPENDIX B

Listing of Variables, Their Sources of Measurement and Unit of Analysis
Table 2. A listing of the variables, their sources of measurement, unit of analysis and number of times measured.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEASUREMENT SOURCE</th>
<th>UNIT OF ANALYSIS</th>
<th>NUMBER OF TIMES MEASUREMENT TAKEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORK</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variability</td>
<td>O.A.I.</td>
<td>nursing unit</td>
<td>once</td>
</tr>
<tr>
<td>Difficulty</td>
<td>O.A.I.</td>
<td>nursing unit</td>
<td>once</td>
</tr>
<tr>
<td>STRUCTURE:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standardization</td>
<td>O.A.I.</td>
<td>nursing unit</td>
<td>once</td>
</tr>
<tr>
<td>Specialization</td>
<td>O.A.I.</td>
<td>nursing unit</td>
<td>once</td>
</tr>
<tr>
<td>Distribution of Authority</td>
<td>O.A.I.</td>
<td>nursing unit</td>
<td>once</td>
</tr>
<tr>
<td>FUNCTIONAL HEALTH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.D.L. Scale</td>
<td>nursing unit</td>
<td></td>
<td>twice</td>
</tr>
</tbody>
</table>

Nursing unit scores for the above variables will be aggregated: for the O.A.I. - from head nurse and staff responses; for the A.D.L. Scale from patient interview responses.
Table 5.
The Operational Definitions and Source of Measurement for the Unit

Demographic Variables

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>OPERATIONAL DEFINITION</th>
<th>SOURCE OF MEASUREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td># Beds</td>
<td>Total bed capacity (BC)</td>
<td>Head Nurse response to interview question listed on the Nursing Unit Information form (NUI)</td>
</tr>
<tr>
<td>Census</td>
<td>Average daily census (ADC) for past year</td>
<td>NUI</td>
</tr>
<tr>
<td>Occupancy</td>
<td>ADC/BC = % of available beds filled</td>
<td>NUI</td>
</tr>
<tr>
<td>% Patients ≥ 65 years of age</td>
<td>% of ADC ≥ 65 years of age</td>
<td>NUI</td>
</tr>
<tr>
<td>Staffing</td>
<td>Number of budgeted staff positions in Full Time Equivalents (FTES)</td>
<td>NUI</td>
</tr>
<tr>
<td>RN Mix</td>
<td># of budgeted registered nurse positions / #FTES</td>
<td>Head Nurse response to Q-11 in Unit Supervisor OAI</td>
</tr>
<tr>
<td>% Positions Vacant</td>
<td># FTES not filled / #FTES</td>
<td>NUI</td>
</tr>
<tr>
<td>Staff Turnover</td>
<td># FTES resigned, transferred or terminated in last year / # FTES</td>
<td>NUI</td>
</tr>
<tr>
<td>Approach to Practice</td>
<td>Patient care delivery model that best fit unit - functional, team, primary nursing or total patient care</td>
<td>NUI</td>
</tr>
<tr>
<td>Criteria used to Evaluate Unit Effectiveness</td>
<td># items ranked as to their importance in determining how effective the unit performs its work (patient, staff, and physician satisfaction, quality of documentation and ability to function within budget boundaries)</td>
<td>Unit Supervisor &amp; Unit Member OAI</td>
</tr>
</tbody>
</table>
Table 6.
Operational Definitions for the Head Nurse Demographic Variables
Measured in the Unit Supervisor OAI

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>OPERATIONAL DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Surgical Nursing Experience</td>
<td>years worked with medical-surgical patients</td>
</tr>
<tr>
<td>Management Experience</td>
<td>years worked as a nurse manager</td>
</tr>
<tr>
<td>Hospital Experience</td>
<td>years worked at current employing hospital</td>
</tr>
<tr>
<td>Unit Experience</td>
<td>years worked on currently assigned unit</td>
</tr>
<tr>
<td>Management Experience on This Unit</td>
<td>years worked as manager on currently assigned unit</td>
</tr>
<tr>
<td>Highest Educational Degree Obtained</td>
<td>Hospital diploma or college associate, bachelors or masters degree</td>
</tr>
<tr>
<td>Highest Educational Degree obtained in Nursing</td>
<td>Diploma, ADN, BSN, HS or MSN</td>
</tr>
</tbody>
</table>
Table 7.
Operational Definitions for the Staff Nurse Demographic Variables Measured in the Unit Member OAI.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>OPERATIONAL DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Surgical Nursing Experience</td>
<td>years worked with medical-surgical patients</td>
</tr>
<tr>
<td>Hospital Experience</td>
<td>years worked at current employing hospital</td>
</tr>
<tr>
<td>Unit Experience</td>
<td>years worked on currently assigned unit</td>
</tr>
<tr>
<td>Highest Educational Degree Obtained</td>
<td>Hospital diploma or college associate, bachelors or masters degree</td>
</tr>
<tr>
<td>Highest Educational Degree obtained in Nursing</td>
<td>Diploma, ADN, BSN, MS or MSN</td>
</tr>
</tbody>
</table>
Table 8.
Operational Definitions and Sources of Measurement for Patient Demographic Variables

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>OPERATIONAL DEFINITION</th>
<th>SOURCE OF MEASUREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE</td>
<td>Years of age on last birthday</td>
<td>Medical Record (MR) Information recorded by interviewers on patient demographic information form (PDI)</td>
</tr>
<tr>
<td>Race</td>
<td>Asian, black, caucasian, american indian or other</td>
<td>MR, PDI</td>
</tr>
<tr>
<td>Medical Diagnosis</td>
<td>admitting diagnoses listed on MR by the patient's physician, coded by researcher as surgical versus medical if the diagnosis inferred that the patient underwent an invasive procedure</td>
<td>MR, PDI</td>
</tr>
<tr>
<td>Length of Stay</td>
<td>Date of admission minus date of discharge</td>
<td>admission date recorded MR, PDI Discharge date obtained by interviewer from unit contact person</td>
</tr>
<tr>
<td>Nursing diagnosis</td>
<td>one of the 85 physical or behavioral responses identified and defined and approved by NANDA at its 8th national conference</td>
<td>Derived by interviewer from the patients MR admission assessment. The NDI was used to record this information.</td>
</tr>
</tbody>
</table>
APPENDIX C

NDI
Nursing Diagnoses Instrument

Patient Medical Record Number

Today's Date:

Identify the nursing diagnoses that are applicable to your patient at the present time by placing a (X) adjacent to the diagnoses in the list below.

- Activity intolerance
- Activity intolerance, potential
- Adjustment, impaired
- Airway clearance, ineffective
- Anxiety
- Aspiration, potential for
- Body image disturbance
- Body temperature, altered, potential
- Bowel incontinence
- Breastfeeding, ineffective
- Breathing pattern, ineffective
- Cardiac output, decreased
- Communication, impaired verbal
- Constipation
- Constipation, colonic
- Constipation, perceived
- Coping, defensive
- Coping, family: potential for growth
- Coping, ineffective family: compromised
- Coping, ineffective family: disabling
- Coping, ineffective individual
- Decisional conflict (specify)
- Denial, ineffective
Diarrhea

Disuse syndrome, potential for

Dysreflexia

Family processes, altered

Fatigue

Fear

Fluid volume deficit (1)

Fluid volume deficit (2)

Fluid volume deficit, potential

Fluid volume excess

Gas exchange, impaired

Grieving, anticipatory

Grieving, dysfunctional

Growth and development, altered

Health maintenance, altered

Health-seeking behaviors (specify)

Home maintenance management, impaired

Hopelessness

Hyperthermia

Hypothermia

Incontinence, functional

Incontinence, reflex

Incontinence, stress

Incontinence, total

Incontinence, urge

Infection, potential for

Injury, potential for

Knowledge deficit (specify)
- Mobility, impaired physical
- Noncompliance (specify)
- Nutrition, altered: less than body requirements
- Nutrition, altered: more than body requirements
- Nutrition, altered: potential for more than body requirements
- Oral mucous membrane, altered
- Pain
- Pain, chronic
- Parental role conflict
- Parenting, altered
- Parenting, altered, potential
- Personal identity disturbance
- Poisoning, potential for
- Post-trauma response
- Powerlessness
- Rape-trauma syndrome
- Rape-trauma syndrome: compound reaction
- Rape-trauma syndrome: silent reaction
- Role performance, altered
- Self-care deficit, bathing/hygiene
- Self-care deficit, dressing/grooming
- Self-care deficit, feeding
- Self-care deficit, toileting
- Self-esteem disturbance
- Self-esteem, chronic low
- Self-esteem, situational low
- Sensory/perceptual alterations (specify) (Visual, auditory, kinesthetic, gustatory, tactile, olfactory)
- Sexual dysfunction
- Sexuality patterns, altered
Skin integrity, impaired
Skin integrity, impaired, potential
Sleep pattern disturbance
Social interaction, impaired
Social isolation
Spiritual distress (distress of the human spirit)
Suffocation, potential for
Swallowing, impaired
Thermoregulation, ineffective
Thought processes, altered
Tissue integrity, impaired
Tissue perfusion, altered (specify type) (renal, cerebral, cardiopulmonary, gastrointestinal, peripheral)
Trauma, potential for
Unilateral neglect
Urinary elimination, altered patterns
Urinary retention
Violence, potential for: self-directed or directed at others
Activity intolerance - The state in which an individual has insufficient physiological or psychological energy to endure or complete required or desired daily activities.

Activity intolerance, potential - The state in which an individual is at risk of experiencing insufficient physiological or psychological energy to endure complete required or desired activities.

Adjustment, impaired - The state in which an individual is unable to modify his/her life-style behavior in a manner consistent with a change in health status.

Airway clearance, ineffective - The state in which an individual is unable to clear secretions or obstructions from the respiratory tract to maintain airway potency.

Anxiety - A vague, uneasy feeling, the source of which is often nonspecific or unknown to the individual.

Aspiration, potential for - The state in which an individual is at risk for entry of gastric secretions, oropharyngeal secretions, or exogenous food or fluids into tracheobronchial passages due to dysfunction or absence of normal protective mechanisms.

Body image disturbance - Disruption in the way one perceives one's body image.

Body temperature, altered, potential - The state in which an individual is at risk for failure to maintain body temperature within normal range.

Bowel incontinence - The state in which an individual experiences a change in normal bowel habits characterized by involuntary passage of stool.

Breastfeeding, ineffective - The state in which a mother, infant, and/or family experiences dissatisfaction or difficulty with the breastfeeding process.

Breathing pattern, ineffective - The state in which an individual's inhalation and/or exhalation pattern does not enable adequate ventilation.

Cardiac output, decreased - The state in which the blood pumped by an individual's heart is sufficiently reduced that it is inadequate to meet the needs of the body's tissues.

Communication, impaired verbal - The state in which an individual experiences a decreased or absent ability to use or understand language in human interaction.

Constipation - The state in which an individual experiences a change in normal bowel habits characterized by a decrease in frequency and/or passage of hard, dry stool.

Constipation, colonic - The state in which an individual's pattern of elimination is characterized by hard, dry stool that results from a delay in passage of food residue.

Constipation, perceived - The state in which an individual makes a self-diagnosis of constipation and ensures a daily bowel movement through use of laxatives, enemas and suppositories.

Coping, defensive - The state in which an individual experiences falsely positive self-evaluation based on a self-protective pattern that defends underlying perceived threats to positive self-regard.

Coping, family: potential for growth - Effective managing of adaptive tasks by family member involved with the client's health challenge, who now is exhibiting desire and readiness for enhanced health and growth in regard to self and in relation to the client.
Coping, ineffective family: compromised - Insufficient, ineffective, or compromised support, comfort, assistance, or encouragement usually by a supportive primary person (family member or close friend); client may need it to manage or master adaptive tasks related to his/her health challenge.

Coping, ineffective family: disabling - Behavior of significant person (family member or other primary person) that disables his/her own capacities and the client's capacities to effectively address tasks essential to either person's adaption to the health challenge.

Coping, ineffective individual - Impairment of adaptive behaviors and problem-solving abilities of a person in meeting life's demands and roles.

Decisional conflict (specify) - A state of uncertainty about the course of action to be taken when choice among competing actions involves risk, loss, or challenge to personal life values.

Denial, ineffective - A conscious or unconscious attempt to disavow the knowledge or meaning of an event to reduce anxiety/fear to the detriment of health.

Diarrhea - The state in which an individual experiences a change in normal bowel habits characterized by the frequent passage of loose, fluid, unformed stools.

Disuse syndrome, potential for - The state in which an individual is at risk for deterioration of body systems as the result of prescribed or unavoidable inactivity.

Diversational activity deficit - The state in which an individual experiences a decreased stimulation from or interest in engagement in recreational or leisure activities.

Dysreflexia - The state in which an individual with a spinal cord injury at T7 or above experiences or is at risk of experiencing a life-threatening uninhibited sympathetic response of the nervous system to a noxious stimulus.

Family processes, altered - The state in which a family that normally functions effectively experiences a dysfunction.

Fatigue - An overwhelming sense of exhaustion and decreased capacity for physical and mental work regardless of adequate sleep.

Fear - Feeling of dread related to an identifiable source that the person validates.

Fluid volume deficit (1) - The state in which an individual experiences vascular, cellular, or intracellular dehydration related to failure of regulatory mechanisms.

Fluid volume deficit (2) - The state in which an individual experiences vascular, cellular, or intracellular dehydration related to active loss.

Fluid volume deficit, potential - The state in which an individual is at risk of experiencing vascular, cellular, or intracellular dehydration.

Fluid volume excess - The state in which an individual experiences increased fluid retention and edema.

Gas exchange, impaired - The state in which an individual experiences an imbalance between oxygen uptake and carbon dioxide elimination at the alveolar-capillary membrane gas exchange area.

Grieving, anticipatory - The state in which an individual grieves before an actual loss.
Grieving, dysfunctional - The state in which actual or perceived object loss (object loss is used in the broadest sense) exists. Objects include people, possessions, a job, status, home, ideals, parts and processes of the body, etc.

Growth and development, altered - The state in which an individual demonstrates deviations in norms from his/her age group.

Health maintenance, altered - Inability to identify, manage, and/or seek out help to maintain health.

Health-seeking behaviors (specify) - The state in which a client in stable health is actively seeking ways to alter personal health habits and/or the environment in order to move toward optimal health. (Stable health status is defined as age-appropriate illness prevention measures achieved; the client reports good or excellent health, and signs and symptoms of disease, if present, are controlled.)

Home maintenance management, impaired - Inability to independently maintain a safe growth-promoting immediate environment.

Hopelessness - The subjective state in which an individual sees limited or no alternatives or personal choices available and is unable to mobilize energy on own behalf.

Hyperthermia - The state in which an individual's body temperature is elevated above his/her normal range.

Hypothermia - The state in which an individual's body temperature is reduced below his/her normal range but not below 35.6°C (rectal) / 36.4°C (rectal, newborn).

Incontinence, functional - The state in which an individual experiences an involuntary, unpredictable passage of urine.

Incontinence, reflex - The state in which an individual experiences an involuntary loss of urine occurring at somewhat predictable intervals when a specific bladder volume is reached.

Incontinence, stress - The state in which an individual experiences a loss of urine of less than 50 ml occurring with increased abdominal pressure.

Incontinence, total - The state in which an individual experiences a continuous and unpredictable loss of urine.

Incontinence, urge - The state in which an individual experiences involuntary passage of urine occurring soon after a strong sense of urgency to void.

Infection, potential for - The state in which an individual is at increased risk for being invaded by pathogenic organisms.

Injury, potential for - The state in which an individual is at risk of injury as a result of environmental conditions interacting with the individual's adaptive and defensive resources.

Knowledge deficit (specify) - The state in which specific information is lacking.

Mobility, impaired physical - The state in which an individual experiences a limitation of ability for independent physical movement.

Noncompliance (specify) - A person's informed decision not to adhere to a therapeutic recommendation.

Nutrition, altered: less than body requirements - The state in which an individual experiences an intake of nutrients insufficient to meet metabolic needs.

Nutrition, altered: more than body requirements - The state in which an individual is experiencing an intake of nutrients that exceeds metabolic needs.
Nutrition, altered: potential for more than body requirements - The state in which an individual is at risk of experiencing an intake of nutrients that exceeds metabolic needs.

Oral mucous membrane, altered - The state in which an individual experiences disruptions in the tissue layers of the oral cavity.

Pain - The state in which an individual experiences and reports the presence of severe discomfort or an uncomfortable sensation.

Pain, chronic - The state in which an individual experiences pain that continues for more than 6 months.

Parental role conflict - The state in which a parent experiences role confusion and conflict in response to a crisis.

Parenting, altered

Parenting, altered, potential - The state in which the ability of nurturing figure(s) to create an environment that promotes the optimum growth and development of another human being is altered or at risk.

Personal identity disturbance - Inability to distinguish self and nonself.

Poisoning potential for - Accentuated risk of accidental exposure to or ingestion of drugs or dangerous products in doses sufficient to cause poisoning.

Post-trauma response - The state in which an individual experiences a sustained painful response to (an) overwhelming traumatic event(s).

Powerlessness - Perception that one's own action will not significantly affect an outcome; a perceived lack of control over a current situation or immediate happening.

Rape-trauma syndrome - Forced, violent sexual penetration against the victim's will and consent. The trauma syndrome that develops from this attack or attempted attack includes an acute phase or disorganization of the victim's life-style and a long-term process of reorganization of life-style.

Rape-trauma syndrome: compound reaction - An acute stress reaction to a rape or attempted rape, experienced along with other major stressors, that can include reactivation of symptoms of a previous condition.

Rape-trauma syndrome: silent reaction - A complex stress reaction to a rape in which an individual is unable to describe or discuss the rape.

Role performance, altered - Disruption in the way one perceives one's role performance.

Self-care deficit, bathing/hygiene - The state in which an individual experiences an impaired ability to perform or complete bathing/hygiene activities for oneself.

Self-care deficit, dressing/grooming - The state in which an individual experiences an impaired ability to perform or complete dressing and grooming activities for oneself.

Self-care deficit, feeding - The state in which an individual experiences an impaired ability to perform or complete feeding activities for oneself.

Self-care deficit, toileting - The state in which an individual experiences an impaired ability to perform or complete toileting activities for oneself.

Self-esteem disturbance - Negative self-evaluation/feelings about self or self-capabilities, which may be directly or indirectly expressed.
Self-esteem, chronic low - Long-standing negative self-evaluation/feelings about self or self-capabilities.

Self-esteem, situational low - Negative self-evaluation/feelings about self that develop in response to a loss or change in an individual who previously had a positive self-evaluation.

Sensory/perceptual alterations (specify) (visual, auditory, kinesthetic, gustatory, tactile, olfactory) - The state in which an individual experiences a change in the amount or patterning of incoming stimuli accompanied by a diminished, exaggerated, distorted, or impaired response to such stimuli.

Sexual dysfunction - The state in which an individual experiences a change in sexual function that is viewed as unsatisfying unrewarding, or inadequate.

Sexuality patterns, altered - The state in which an individual expresses concern regarding his/her sexuality.

Skin integrity, impaired - The state in which an individual's skin is adversely altered.

Skin integrity, impaired, potential - The state in which an individual's skin is at risk of being adversely altered.

Sleep pattern disturbance - Disruption of sleep time causes discomfort or interferes with desired life-style.

Social interaction, impaired - The state in which an individual participates in an insufficient or excessive quantity or ineffective quality of social exchange.

Social isolation - Aloneness experienced by an individual and perceived as imposed by others and as a negative or threatened state.

Spiritual distress (distress of the human spirit) - Disruption in the life principle that pervades a person's entire being and transcends one's biological and psychosocial nature.

Suffocation, potential for - Accentuated risk of accidental suffocation (inadequate air available for inhalation).

Swallowing, impaired - The state in which an individual has decreased ability to voluntarily pass fluids and/or solids from the mouth to the stomach.

Thermoregulation, ineffective - The state in which an individual's temperature fluctuates between hypothermia and hyperthermia.

Thought processes, altered - The state in which an individual experiences a disruption in cognitive operations and activities.

Tissue integrity, impaired - The state in which an individual experiences damage to mucous membrane or corneal, integumentary, or subcutaneous tissue.

Tissue perfusion, altered (specify type) (renal, cerebral, peripheral cardiopulmonary, gastrointestinal) - The state in which an individual experiences a decrease in nutrition and oxygenation at the cellular level due to a deficit in capillary blood supply.

Trauma, potential for - Accentuated risk of accidental tissue injury (e.g., wound, burn, fracture).

Unilateral neglect - The state in which an individual is perceptually unaware of an inattentive to one side of the body.

Urinary elimination, altered patterns - The state in which an individual experiences a disturbance in urine elimination.

Urinary retention - The state in which an individual experiences incomplete emptying of the bladder.

Violence, potential for: self-directed or directed at others - The state in which an individual experiences behaviors that can be physically harmful either to the self or others.
APPENDIX D

NDI Interrator Agreement
### TABLE 5: NURSE DIAGNOSIS INTERRATER AGREEMENT

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APPENDIX E

Supervisor OAI
January 2, 1991

Case Western Reserve University
Frances Payne Bolton School of Nursing
2121 Abington Road
Cleveland, Ohio 44106

Dear Nurse Colleague:

As a graduate student from Case Western Reserve University, I am studying the structure of hospital nursing units and exploring units differences in terms of their patients needs and functional outcomes. The purpose of this study is to describe the relationships between nursing staff structure and the needs and characteristics of patients.

I would like you to participate in this study by taking 15-20 minutes to answer questions about your unit and the kinds of patients you care for. By answering the questions you will be providing information that is vital to furthering our understanding of the relationships between nursing unit structure and patient outcomes. You will also be reading questions that may stimulate thought and increase your understanding of the complexity of your work.

Information obtained about you as an individual will be kept confidential. Do not write your name on the questionnaire. The study will collate responses for groups rather than individuals and report responses as numbers or general characteristics. Details that would enable your unit to be recognized will not be revealed.

There are no anticipated risks to you for participating or not participating. Your participation is completely voluntary and will be kept confidential. At no time will participating individuals be identified.

By completing the attached questionnaire you will indicate your consent for participation in this study. After completion, place the questionnaire in the attached envelope. If you do not wish to participate in this study, please return the questionnaire unanswered. As discussed, I will return later for the envelope.

Thank you for taking the time to read this. I hope you will be interested in completing the questionnaire. If you have any questions about the study, you can reach me per phone at 829-3704.

Sincerely,

Deborah Brinker, R.N.,M.S.N.
WORK-UNIT STRUCTURE
OF MEDICAL-SURGICAL UNITS

THIS SURVEY IS TO BETTER UNDERSTAND HOW
UNITS DIFFER IN TERMS OF THEIR PATIENTS,
TECHNIQUES, AND STAFFING STRUCTURES.

PLEASE ANSWER ALL THE QUESTIONS. IF YOU
WISH TO COMMENT ON ANY QUESTIONS OR QUALIFY
YOUR ANSWERS, PLEASE USE THE MARGINS.

FRANCES PAYNE BOLTON SCHOOL OF NURSING
CASE WESTERN RESERVE UNIVERSITY
CLEVELAND, OHIO 44106
UNIT SUPERVISOR QUESTIONNAIRE

GENERAL INSTRUCTIONS

Definitions: This questionnaire asks many questions about your immediate unit and your unit members.

* Your immediate unit includes you (as the supervisor) and all individuals who report directly to you.

* Unit members are all individuals in your immediate unit except you as the unit supervisor.

Most of the questions ask you to circle one of several numbers that appear on a scale below the item. Corresponding with each number on a scale is a brief description of what the number represents. You are to circle the one number that most accurately reflects your answer to each question.

For example, if your answer to the following question is "very much" (and I believe it should be), circle the number "3" on the answer scale:

How much is it worth my time to fill out this questionnaire during the next hour?

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<th>QUITE A BIT</th>
<th>VERY MUCH</th>
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1. Go to next page
The Nature of Your Work and Job

The following questions ask you about the kinds of patient care activities that make up your job.

Q-1. To what extent do you care for similar patients from day to day? (Circle a number below the scale.)

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<th>MANY OF MY</th>
<th>ABOUT HALF</th>
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<th>ALMOST NO</th>
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1 2 3 4 5

Q-2. From day to day, how similar are your patients nursing diagnoses or problems? (Circle a number below.)

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1 2 3 4 5

Q-3. How easy is it for you to know whether you care for your patients correctly?

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<th>SOMEWHAT EASY</th>
<th>QUITE EASY</th>
<th>VERY EASY</th>
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1 2 3 4 5

Q-4. What percent of the time are you generally sure of what the outcomes of your clinical efforts will be?

| 40% OR LESS | 41-60% | 61-75% | 76-90% | 91% OR MORE |

1 2 3 4 5

Q-5. How frequently do you encounter patients who require interventions that are not routinely performed on your unit?

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<th>VERY OFTEN</th>
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1 2 3 4 5
Q-6. In the past 3 months, how often did difficult problems arise while caring for patients for which there were no immediate or apparent solutions?

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Q-7. About how much time did you spend solving these work problems?

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Q-8. In the past 3 months, how many hours per week on or off the job do you spend in some kind of reading or training to keep current in the clinical skills needed to do your job?

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</tbody>
</table>

Q-9. During the past 3 months, what kind of educational programs did you participate in that were related to your work? (Circle the number next to the activities which are applicable.)

1) Inservices or workshops
2) Reading
3) College classes
4) Other (please describe)

Q-10. When you began working on this unit, how much orientation did you receive that was directly related to your care of patients? (Circle a number below the scale.)

<table>
<thead>
<tr>
<th>A Few Hours Or Less</th>
<th>About A Day</th>
<th>About A Week</th>
<th>About A Month</th>
<th>More Than A Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Go to next page
The Organization and Work of Your Unit

So far you have been asked questions about your work and your job. This next part asks how your unit is organized to do this work and achieve its performance goals. Please keep in mind that your unit consists of your and all of the individuals who report directly to you.

When answering the following questions use "full time" to refer to staff who work 36 hours or more per week, and "part time" to refer to staff who work less than 36 hours per week.

Q-11. a. Please fill in the number of personnel positions you have on your unit for each of the following types:

1) REGISTERED NURSE (FULL TIME) ______
2) REGISTERED NURSE (PART TIME) ______
3) LICENSED PRACTICAL NURSE (FULL TIME) ______
4) LICENSED PRACTICAL NURSE (PART TIME) ______
5) NURSE AIDS (FULL-TIME) ______
6) NURSE AIDS (PART TIME) ______
7) OTHER

b. For the staff members not included in the above list, please fill in number and types of personnel you use to staff your unit.

LIST JOB CLASSIFICATIONS
OF ALL PERSONNEL. LIST
PART TIME AND FULL TIME
POSITIONS SEPARATELY
NUMBER OF STAFF PER CLASSIFICATION

Q-12. During the past 3 months, how many of your immediate unit subordinates performed the same basic tasks, or did each perform different tasks? (Circle the number below the scale.)

<table>
<thead>
<tr>
<th>NO ONE PERFORMED</th>
<th>ONLY A FEW PERFORMED</th>
<th>ABOUT HALF PERFORMED</th>
<th>MANY PERFORMED</th>
<th>ALL PERFORMED THE SAME TASKS</th>
<th>SAME TASKS</th>
<th>SAME TASKS</th>
<th>SAME TASKS</th>
<th>SAME TASKS</th>
<th>BASIC TASKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>Go to next page</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q-13. How many of your immediate subordinates are qualified to complete one another's patient care assignments?

<table>
<thead>
<tr>
<th></th>
<th>NONE</th>
<th>ONLY A FEW</th>
<th>ABOUT HALF</th>
<th>MANY</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Q-14. How easy would it be to switch patient assignments among your immediate subordinates?

<table>
<thead>
<tr>
<th>VERY DIFFICULT</th>
<th>QUITE DIFFICULT</th>
<th>SOMEWHAT DIFFICULT</th>
<th>QUITE EASY</th>
<th>VERY EASY</th>
<th>MOST MEMBERS</th>
<th>SOME MEMBERS</th>
<th>WOULD NEED</th>
<th>WOULD NEED</th>
<th>WOULD NEED</th>
<th>WOULD NEED</th>
<th>EXTENSIVE</th>
<th>EXTENSIVE</th>
<th>RETRAINING</th>
<th>RETRAINING</th>
<th>RETRAINING</th>
<th>RETRAINING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q-15. During the past 3 months, how often did your immediate subordinates rotate their jobs by performing one another's work?

<table>
<thead>
<tr>
<th>NOT</th>
<th>ABOUT EVERY</th>
<th>ABOUT EVERY</th>
<th>ABOUT EVERY</th>
<th>ABOUT EVERY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONCE</td>
<td>MONTH</td>
<td>WEEK</td>
<td>DAY</td>
<td>HOUR</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Q-16. How much say or influence do each of the following have in deciding what kinds of work or tasks are to be performed in your unit?

**AMOUNT OF SAY IN DECIDING UNIT'S WORK**

<table>
<thead>
<tr>
<th>QUITE</th>
<th>NONE</th>
<th>LITTLE</th>
<th>SOME</th>
<th>A BIT</th>
<th>MUCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Administration or other departments?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b. You, as unit supervisor?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>c. Your immediate subordinates individually?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>d. You and your subordinates as a group in unit meetings?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Criteria For Evaluating Unit Effectiveness

Listed below are 5 criteria often used to determine how effectively a nursing unit functions.

Q-17. From the following list, please rank these criteria as to their level of importance on your unit in determining how effectively your unit performs its work.

(Put appropriate number in each box, use each number only once)

MOST IMPORTANT
SECOND MOST IMPORTANT
THIRD MOST IMPORTANT
FOURTH MOST IMPORTANT
FIFTH MOST IMPORTANT

1. PATIENT SATISFACTION
2. UNIT STAFF SATISFACTION
3. PHYSICIAN SATISFACTION
4. QUALITY OF CHARTING
5. UNIT FINANCIAL COSTS OR ABILITY TO FUNCTION WITHIN ITS BUDGET

Q-18. How much influence or say did each of the following have in deciding these performance criteria for your unit?

a. Administration or other departments
   AMOUNT OF INFLUENCE IN DECIDING CRITERIA
   QUITE VERY
   NONE LITTLE SOME A BIT MUCH
   1 2 3 4 5

b. You, as the unit supervisor?
   1 2 3 4 5

c. Your immediate subordinates individually?
   1 2 3 4 5

d. You and your immediate subordinates as a group in unit meetings?
   1 2 3 4 5

Q-19. How much do people in your unit agree that these are the most important criteria for evaluating the performance of your unit?

NOT AT ALL AGREE A LITTLE AGREE SOMewhat AGREE QUite A BIT AGREE VERY MUCH

1 2 3 4 5

6 Go to next page
Q-20. To what degree are numerical or quantified procedures used to measure these performance criteria of your unit?

<table>
<thead>
<tr>
<th>Only Subjective Measures and Quantified Procedures</th>
<th>Very Specific and Precise Measures and Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONLY SUBJECTIVE NON QUANTIFIED</td>
<td>LOOSE BUT QUANTIFIED</td>
</tr>
<tr>
<td>NO MEASUREMENT IMPRESSIONS ARE RECORDED</td>
<td>QUITE SPECIFIC QUANTIFIED</td>
</tr>
<tr>
<td>IS MADE ARE RECORDED</td>
<td>QUANTIFIED PROCEDURES ARE RECORDED</td>
</tr>
<tr>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

Q-21. To what degree are each of the following methods of appraisal relied upon to evaluate how well your unit performs its work?

a. Automated control systems or built-in monitoring devices (e.g., computer rejections, mechanical alerts)?

b. Appraisals made by line managers of staff specialists outside of your immediate work unit?

c. Appraisals made by you individually, as the unit supervisor?

d. Appraisals made by your immediate subordinates who individually review and evaluate their own performance?

e. Appraisals made by you and your immediate subordinates as a group, who meet to review and evaluate the work of one or more unit members?

DEGREE RELIED ON FOR EVALUATING WORK

NONE LITTLE SOME A BIT MUCH

| 1 2 3 4 5 |
|-----------|---------|
| 1 2 3 4 5 |
| 1 2 3 4 5 |
| 1 2 3 4 5 |
| 1 2 3 4 5 |
Q-22. How clearly have specific performance targets been set for your unit?

| NO TARGETS ARE VERY UNCLEAR CLEAR SOMEWHAT CLEAR QUITE CLEAR VERY CLEAR |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1                           | 2               | 3               | 4               | 5               |

Q-23. When target performance goals for your unit are attained or surpassed, how often do the following things happen:

a. All people in this unit are rewarded or recognized as a group for their team achievements?
   1 2 3 4 5

b. Specific individuals in this unit are rewarded or recognized for their individual achievements?
   1 2 3 4 5

Q-24. When target performance goals for your unit are not attained, how often do the following things happen:

a. All people in this unit as a group are reprimanded or told to "shape up" to improve their individual performances?
   1 2 3 4 5

b. Specific individuals in your unit are reprimanded or told to "shape up" to improve their individual performances?
   1 2 3 4 5
Q-25. How much do members of your unit do the following things:

<table>
<thead>
<tr>
<th>HOW MUCH THIS HAPPENS</th>
<th>NOT AT ALL</th>
<th>A LITTLE</th>
<th>SOME</th>
<th>A BIT</th>
<th>MUCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Compete with each other to achieve performance targets?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b. &quot;Gang-up&quot; on the individual whose work is far below those of the others?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>c. &quot;Gang-up&quot; on the individual whose work exceeds that of the others?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>d. Encourage individuals to excel and strive for increasingly higher levels of performance?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>e. Try to get ahead at expense of other unit members?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Rules, Policies, and Procedures for the Unit as a Whole

Think about the various operating rules, policies, and procedures that all personnel in your unit are expected to follow to coordinate and control all the work activities performed in your unit. These rules and procedures may be formal or informal, written or unwritten, however, they are different from those used to guide each individual in performing his or her own job, because they apply to all people in your unit, regardless of the particular job each performs.

Q-26. How precisely do these rules, policies, and procedures specify how much work activities are to be coordinated and controlled in your unit?

<table>
<thead>
<tr>
<th>HOW SPECIFIC</th>
<th>NOT AT ALL</th>
<th>A LITTLE</th>
<th>SOME</th>
<th>A BIT</th>
<th>MUCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY GENERAL</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>MOSTLY GENERAL</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>SOMEWHAT SPECIFIC</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QUITE SPECIFIC</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VERY SPECIFIC</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q-27. During the past 3 months, how often was the work on your unit guided by established rules, policies or procedures?

<table>
<thead>
<tr>
<th>HOW OFTEN</th>
<th>NOT AT ALL</th>
<th>VERY SELDOM</th>
<th>ABOUT HALF THE TIME</th>
<th>QUITE OFTEN</th>
<th>ALL THE TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Go to next page
Q-28. When caring for patients on your unit, how frequently do you apply established nursing procedures or standards of care?

VERY RARELY  OCCASIONALLY  QUITE OFTEN  VERY OFTEN  CONSTANTLY

1  2  3  4  5

Q-29. What percent of these operating rules, policies, and procedures for your unit as a whole are written out in memos, reports, or a procedures manual?

0-20%  21-40%  41-60%  61-80%  81-100%

1  2  3  4  5

Q-30. How much influence or say did each of the following have in deciding upon the rules, policies, and procedures for your unit:

a. Administration or other department?

b. You, as unit supervisor?

c. Your immediate subordinates individually?

d. You and your immediate subordinates as a group in unit meetings?

AMOUNT OF INFLUENCE IN DECIDING UNIT PROCEDURE

NONE  LITTLE  SOME  A BIT  MUCH

1  2  3  4  5
The next four questions are about the internal flow of work between your immediate subordinates. Listed below are four common ways that the work performed in your unit can flow between your immediate subordinates.

Q-31. Please indicate how much of the normal work in your unit flows between your immediate subordinates in a manner as described by each of the following cases:

a. Independent Work Flow Case, where work and activities are performed by your immediate subordinates separately and do not flow between them.

   1  2  3  4  5

b. Sequential Work Flow Case, where work and activities flow between your immediate subordinates, but mostly in only one direction.

   1  2  3  4  5

c. Reciprocal Work Flow Case, where work and activities flow between your immediate subordinates in a back and forth manner over a period of time.

   1  2  3  4  5

d. Team Work Flow Case, where work and activities come into your unit and your immediate subordinates diagnose, problem solve, and collaborate as a group at the same time in meetings to deal with the work.

   1  2  3  4  5

Q-32. To obtain the information and materials needed to do their work, how much do unit members have to rely upon each of the following people:

   NOT AT ALL  A LITTLE  SOME  A BIT  QUITE  VERY  MUCH

a. You, the unit supervisor?

   1  2  3  4  5

b. Other members in your unit?

   1  2  3  4  5

c. People outside of your unit?

   1  2  3  4  5
Q-33. While doing assigned tasks, how much do unit members have to depend on each of the following people?

<table>
<thead>
<tr>
<th>NOT AT ALL</th>
<th>A LITTLE</th>
<th>SOME</th>
<th>A BIT</th>
<th>MUCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Your unit supervisor?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>b. Other unit members or co-workers?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>c. People outside of your unit?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Q-34. After unit members finish their part of the task, how much do they have to rely on each of the following people to perform the next steps in the process before the total task or service is completed?

<table>
<thead>
<tr>
<th>NOT AT ALL</th>
<th>A LITTLE</th>
<th>SOME</th>
<th>A BIT</th>
<th>MUCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. You, the unit supervisor?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>b. Other members in your unit?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>c. People outside of your unit?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Q-35. To coordinate the work of your unit during the past 3 months, how often were written reports or memos sent or received?

<table>
<thead>
<tr>
<th>HOW OFTEN RECEIVED OR SENT WRITTEN REPORTS OR MEMOS IN PAST 3 MONTHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABOUT</td>
</tr>
<tr>
<td>1-3 TIMES</td>
</tr>
<tr>
<td>ONCE A MONTH</td>
</tr>
<tr>
<td>a. Between you and unit members?</td>
</tr>
<tr>
<td>b. Among unit members?</td>
</tr>
<tr>
<td>c. Between you and people outside of your unit?</td>
</tr>
</tbody>
</table>
Q-36. During the past 3 months, how often did work related discussions (face-to-face or by telephone) occur on a one-to-one basis:

<table>
<thead>
<tr>
<th></th>
<th>About</th>
<th>About</th>
<th>About</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-3</td>
<td>1-3</td>
<td>1-3</td>
</tr>
<tr>
<td>Not Times</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Every</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Between you and unit members?
   1 2 3 4 5
b. Among unit members?
   1 2 3 4 5
c. Between you and people outside of your unit?
   1 2 3 4 5

Q-37. How frequently did you conduct regularly scheduled staff or unit meetings with your immediate subordinates during the past 3 months?

<table>
<thead>
<tr>
<th></th>
<th>About</th>
<th>About</th>
<th>About</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-3</td>
<td>1-3</td>
<td>1-3</td>
</tr>
<tr>
<td>Not Times</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Every</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q-38. During the past 3 months, how frequently were you involved in impromptu, unscheduled meetings to solve specific work problems:

a. With two or more of your subordinates?
   1 2 3 4 5
b. With two or more people from outside of your unit?
   1 2 3 4 5

Q-39. During the past 3 months, how often were there disagreements or arguments?

<table>
<thead>
<tr>
<th></th>
<th>About</th>
<th>About</th>
<th>About</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Once</td>
<td>Every</td>
<td>Once</td>
</tr>
<tr>
<td></td>
<td>A Month</td>
<td>2 Weeks</td>
<td>A Week</td>
</tr>
<tr>
<td></td>
<td>Day</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Between you and unit members?
   1 2 3 4 5
b. Among unit members?
   1 2 3 4 5
c. Between you and people outside of your unit?
   1 2 3 4 5
Q-40. When these disagreements or disputes occurred, how often were they handled in each of the following ways in the past three months?

| HOW OFTEN DISPUTES RESOLVED THIS WAY | NEVER | Seldom | The Time | Often | Very  
|-------------------------------------|-------|--------|----------|-------|-------
| a. By ignoring or avoiding the issues? | 1  | 2  | 3  | 4  | 5  
| b. By smoothing over the issues?     | 1  | 2  | 3  | 4  | 5  
| c. By bringing the issues out in the open and working them out among the parties involved? | 1  | 2  | 3  | 4  | 5  
| d. By having a higher-level supervisor resolve the issues between units? | 1  | 2  | 3  | 4  | 5  

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Now I want to ask you some questions about yourself to help interpret the results of this study.

Q-41. How many years have you worked with medical-surgical patients? (Fill in number of years).

__________Years

Q-42. How many years have you worked in this hospital?

__________Years

Q-43. How many years have you worked on this unit?

__________Years

Q-44. How many years have you worked as a nurse manager?

__________Years

Q-45. How many years have you worked as a nurse manager in this hospital?

__________Years

Q-46. How many years have you worked as a nurse manager on this unit?

__________Years

Q-47. What is the highest educational degree you obtained in school? (Circle number).

1) DIPLOMA FROM A HOSPITAL
2) COLLEGE ASSOCIATES DEGREE
3) BACHELORS DEGREE
4) MASTERS DEGREE

Q-48. What is your highest educational degree in nursing?

1) DIPLOMA
2) A.D.N.
3) B.S.N.
4) M.S.N. OR M.S.
January 2, 1991

Case Western Reserve University
Frances Payne Bolton School of Nursing
1131 Abington Road
Cleveland, Ohio 44106

Dear Nurse Colleague:

As a graduate student from Case Western Reserve University, I am studying the structure of hospital nursing units and exploring units differences in terms of their patients needs and functional outcomes. The purpose of this study is to describe the relationships between nursing staff structure and the needs and characteristics of patients.

I would like you to participate in this study by taking 15-20 minutes to answer questions about your unit and the kinds of patients you care for. By answering the questions you will be providing information that is vital to furthering our understanding of the relationships between nursing unit structure and patient outcomes. You will also be reading questions that may stimulate thought and increase your understanding of the complexity of your work.

Information obtained about you as an individual will be kept confidential. Do not write your name on the questionnaire. The study will collate responses for groups rather than individuals and report responses as numbers or general characteristics. Details that would enable your unit to be recognized will not be revealed. There are no anticipated risks to you for participating or not participating. Your participation is completely voluntary and will be kept confidential. At no time will participating individuals be identified.

By completing the attached questionnaire you will indicate your consent for participation in this study. After completion, place the questionnaire in the attached envelope. If you do not wish to participate in this study, please return the questionnaire unanswered. As discussed, I will return later for the envelope.

Thank you for taking the time to read this. I hope you will be interested in completing the questionnaire. If you have any questions about the study, you can reach me per phone at 829-3704.

Sincerely,

Deborah Brinker, R.N., M.S.N.
WORK-UNIT STRUCTURE
OF MEDICAL-SURGICAL UNITS

THIS SURVEY IS TO BETTER UNDERSTAND HOW UNITS DIFFER IN TERMS OF THEIR PATIENTS, TECHNIQUES, AND STAFFING STRUCTURES.

PLEASE ANSWER ALL THE QUESTIONS. IF YOU WISH TO COMMENT ON ANY QUESTIONS OR QUALIFY YOUR ANSWERS, PLEASE USE THE MARGINS.

FRANCES PAYNE BOLTON SCHOOL OF NURSING
CASE WESTERN RESERVE UNIVERSITY
CLEVELAND, OHIO 44106
UNIT MEMBER QUESTIONNAIRE

GENERAL INSTRUCTIONS

Definitions: This questionnaire asks many questions about your immediate unit and your unit members.

* Unit supervisor means that person whom you report directly, today.

* Work unit means your immediate supervisor and all individuals (your co-workers) who directly report to your immediate supervisor.

* Unit members are all the individuals in your immediate unit except your immediate supervisor.

Most of the questions ask you to circle one of several numbers that appear on a scale below the item. Corresponding with each number on a scale is a brief description of what the number represents. You are to circle the one number that best accurately reflects your answer to each question.

For example, if your answer to the following question is "very much" (and I believe it should be), circle the number "5" on the answer scale:

How much is it worth my time to fill out this questionnaire during the next hour?

<table>
<thead>
<tr>
<th>SOME</th>
<th>LITTLE</th>
<th>SOME</th>
<th>QUITE</th>
<th>VERY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

1 Go to next page
The Nature of Your Work and Job

The following questions ask you about the kinds of patient care activities that make up your job.

PLEASE ANSWER THE FOLLOWING QUESTIONS BY THINKING ONLY ABOUT THE CLINICAL ASPECTS OF YOUR JOB.

Q-1. To what extent do you care for similar patients from day to day? (Circle a number below the scale.)

<table>
<thead>
<tr>
<th>ALMOST ALL</th>
<th>MANY OF MY</th>
<th>ABOUT HALF</th>
<th>SOME OF MY</th>
<th>ALMOST NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>MY PATIENTS</td>
<td>PATIENTS ARE</td>
<td>MY PATIENTS</td>
<td>PATIENTS ARE</td>
<td>PATIENTS ARE</td>
</tr>
<tr>
<td>ARE THE SAME</td>
<td>THE SAME</td>
<td>ARE THE SAME</td>
<td>THE SAME</td>
<td>THE SAME</td>
</tr>
<tr>
<td>DAY TO DAY</td>
<td>DAY TO DAY</td>
<td>DAY TO DAY</td>
<td>DAY TO DAY</td>
<td>DAY TO DAY</td>
</tr>
</tbody>
</table>

1 2 3 4 5

Q-2. From day to day, how similar are your patients' nursing diagnoses or problems? (Circle a number below.)

<table>
<thead>
<tr>
<th>VERY MUCH</th>
<th>MOSTLY</th>
<th>QUITE A BIT</th>
<th>VERY MUCH</th>
<th>COMPLETELY</th>
</tr>
</thead>
<tbody>
<tr>
<td>THE SAME</td>
<td>THE SAME</td>
<td>DIFFERENT</td>
<td>DIFFERENT</td>
<td>DIFFERENT</td>
</tr>
</tbody>
</table>

1 2 3 4 5

Q-3. How easy is it for you to know whether you care for your patients correctly?

| VERY DIFFICULT | QUITE DIFFICULT | SOMEWHAT EASY | QUITE EASY | VERY EASY |

1 2 3 4 5

Q-4. What percent of the time are you generally sure of what the outcomes of your clinical efforts will be?

| 40% OR LESS | 41-60% | 61-75% | 76-90% | 91% OR MORE |

1 2 3 4 5

Q-5. How frequently do you encounter patients who require interventions that are not routinely performed on your unit?

| VERY RARELY | OCCASIONALLY | QUITE OFTEN | VERY OFTEN | CONSTANTLY |

1 2 3 4 5
Q-6. In the past 3 months, how often did difficult problems arise while caring for patients for which there were no immediate or apparent solutions?

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONCE A WEEK</td>
<td>2-4 TIMES</td>
<td>ABOUT A WEEK</td>
<td>ABOUT A DAY</td>
<td>5 TIMES OR MORE</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Q-7. About how much time did you spend solving these work problems?

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
</tr>
</thead>
<tbody>
<tr>
<td>LESS THAN 1 HOUR/WEEK</td>
<td>ABOUT 1-4 HOURS/WEEK</td>
<td>ABOUT 1 HOUR/DAY</td>
<td>ABOUT 2-3 HOURS/DAY</td>
<td>4 HOURS OR MORE PER DAY</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Q-8. In the past 3 months, how many hours per week on or off the job do you spend in some kind of reading or training to keep current in the clinical skills needed to do your job?

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
</tr>
</thead>
<tbody>
<tr>
<td>LESS THAN 1 HR/WK</td>
<td>1-3 HR/WK</td>
<td>4-6 HR/WK</td>
<td>7-9 HR/WK</td>
<td>OR MORE</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Q-9. During the past 3 months, what kind of educational programs did you participate in that were related to your work? (Circle the number next to the activities which are applicable.)

1) INSERVICES OR WORKSHOPS
2) READING
3) COLLEGE CLASSES
4) OTHER (PLEASE DESCRIBE ________________________________)

Q-10. When you began working on this unit, how much orientation did you receive that was directly related to your care of patients? (Circle a number below the scale.)

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
</tr>
</thead>
<tbody>
<tr>
<td>A FEW HOURS OR LESS</td>
<td>ABOUT A DAY</td>
<td>ABOUT A WEEK</td>
<td>ABOUT A MONTH</td>
<td>MORE THAN A MONTH</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3

Go to next page
The Organization and Work of Your Unit

So far you have been asked questions about your work and your job. This next part asks how your unit is organised to do this work and achieve its performance goals. Please keep in mind that your unit consists of your immediate supervisor and all individuals (your co-workers) who report directly to your supervisor.

Q-11. During the past 3 months, how many people in your unit performed the same basic tasks as you did?

<table>
<thead>
<tr>
<th>NONE</th>
<th>ONLY ONE</th>
<th>A FEW OTHERS</th>
<th>MOST OTHERS</th>
<th>ALL OTHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Q-12. How many other people in your unit are qualified to complete your patient care assignments?

<table>
<thead>
<tr>
<th>NONE</th>
<th>ONLY ONE</th>
<th>A FEW OTHERS</th>
<th>MOST OTHERS</th>
<th>ALL OTHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Q-13. How easy would it be to switch patient assignments between unit staff members?

<table>
<thead>
<tr>
<th>VERY DIFFICULT</th>
<th>QUITE DIFFICULT</th>
<th>SOMEWHAT</th>
<th>MOST MEMBERS</th>
<th>SOME MEMBERS</th>
<th>DIFFICULT</th>
<th>QUITE EASY</th>
<th>VERY EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOULD NEED</td>
<td>WOULD NEED</td>
<td>WOULD NEED</td>
<td>WOULD NEED</td>
<td>WOULD NEED</td>
<td>A FEW</td>
<td>SOME MEMBERS</td>
<td>NO MEMBERS</td>
</tr>
<tr>
<td>REtraining</td>
<td>REtraining</td>
<td>REtraining</td>
<td>REtraining</td>
<td>REtraining</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q-14. How much say or influence do each of the following have in deciding what kinds of work or tasks are to be performed in your unit:

<table>
<thead>
<tr>
<th>AMOUNT OF SAY IN DECIDING UNIT'S WORK</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>a. Administration or other departments?</td>
</tr>
<tr>
<td>b. Your unit supervisor?</td>
</tr>
<tr>
<td>c. Unit members individually?</td>
</tr>
<tr>
<td>d. Your supervisor and unit members as a group in unit meetings?</td>
</tr>
</tbody>
</table>

4

Go to next page
Criteria for Evaluating Unit Effectiveness

Q-15. From the following list, please rank these criteria as to their level or importance on your unit in determining how effectively your unit performs its work.

(Most appropriate number in each box, use each number only once)

MOST IMPORTANT

1. PATIENT SATISFACTION
2. UNIT STAFF SATISFACTION
3. PHYSICIAN SATISFACTION
4. QUALITY OF CHARTING
5. UNIT FINANCIAL COSTS OR ABILITY TO FUNCTION WITHIN ITS BUDGET

SECOND MOST IMPORTANT

THIRD MOST IMPORTANT

FOURTH MOST IMPORTANT

FIFTH MOST IMPORTANT

Q-16. How much influence or say did each of the following have in deciding these performance criteria for your unit?

AMOUNT OF INFLUENCE IN DECIDING CRITERIA

<table>
<thead>
<tr>
<th>NONE</th>
<th>LITTLE</th>
<th>SOME</th>
<th>A BIT</th>
<th>MUCH</th>
</tr>
</thead>
</table>

a. Administration or other departments?

b. You, as the unit members?

c. Your immediate supervisor?

d. You and your immediate supervisor/co-workers as a group in unit meetings?

Q-17. How much do people in your unit agree that these are the most important criteria for evaluating the performance of your unit?

AGREE NOT AT ALL AGREE A LITTLE AGREE SOMEWHAT AGREE QUITE A BIT AGREE VERY MUCH

1 2 3 4 5

5 Go to next page
Q-18. How much do members of your unit do the following things?

<table>
<thead>
<tr>
<th>HOW MUCH THIS HAPPENS</th>
<th>NOT AT ALL</th>
<th>A LITTLE</th>
<th>SOME A BIT</th>
<th>QUITE A BIT</th>
<th>VERY MUCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Compete with each other to achieve performance targets?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b. &quot;Gang-up&quot; on the individual whose work is far below that of the others?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>c. &quot;Gang-up&quot; on the individual whose work exceeds that of the others?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>d. Encourage individuals to excel and strive for increasingly higher levels of performance?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>e. Try to get ahead at expense of other unit members?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Rules, Policies, and Procedures for the Unit as a Whole

Think about the various operating rules, policies, and procedures that all personnel in your unit are expected to follow to coordinate and control all the work activities performed in your unit. These rules and procedures may be formal or informal, written or unwritten, however, they are different from those used to guide each individual in performing his or her own job, because they apply to all people in your unit, regardless of the particular job each performs.

Q-19. How precisely do these rules, policies, and procedures specify how much work activities are to be coordinated and controlled in your unit?

<table>
<thead>
<tr>
<th>HOW MUCH THIS HAPPENS</th>
<th>VERY GENERAL</th>
<th>MOSTLY GENERAL</th>
<th>SOMEWHAT SPECIFIC</th>
<th>QUITE SPECIFIC</th>
<th>VERY SPECIFIC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Q-20. During the past 3 months, how often was your work guided by established rules, policies or procedures?

<table>
<thead>
<tr>
<th>NOT ONCE</th>
<th>VERY Seldom</th>
<th>ABOUT HALF THE TIME</th>
<th>QUITE OFTEN</th>
<th>ALL THE TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Q-21. When caring for patients on your unit, how frequently do you apply established nursing procedures or standards or care?

<table>
<thead>
<tr>
<th>VERY RARELY</th>
<th>OCCASIONALLY</th>
<th>QUITE OFTEN</th>
<th>VERY OFTEN</th>
<th>CONSTANTLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Q-22. How much influence or say did each of the following have in deciding upon the rules, policies, and procedures for your unit:

<table>
<thead>
<tr>
<th>AMOUNT OF INFLUENCE IN DECIDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT PROCEDURE</td>
</tr>
<tr>
<td>QUITE VERY</td>
</tr>
<tr>
<td>NONE</td>
</tr>
<tr>
<td>LITTLE</td>
</tr>
<tr>
<td>SOME</td>
</tr>
<tr>
<td>A BIT</td>
</tr>
<tr>
<td>MUCH</td>
</tr>
</tbody>
</table>

a. Administration or other department?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

b. Your unit supervisor?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

c. Unit members, individually?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>
d. The unit supervisor and members as a group in unit meetings?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

Coordination of Job and Unit Activities with Others

In general, your job and your unit do not exist in isolation from other people in this organization. The following questions ask how much you depend upon and coordinate with others to do your work.

Q-23. To obtain the information and materials needed to do their work, how much do unit members have to rely upon each of the following people:

<table>
<thead>
<tr>
<th>NOT AT ALL</th>
<th>A LITTLE</th>
<th>SOME</th>
<th>A BIT</th>
<th>MUCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUITE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VERY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Your unit supervisor?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

b. Other unit members or co-workers

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>
c. People outside of your unit?

| 1 | 2 | 3 | 4 | 5 |
Q-24. While doing assigned tasks, how much do you have to depend on each of the following people? 

<table>
<thead>
<tr>
<th>Likely to Depend</th>
<th>NOT AT ALL</th>
<th>A LITTLE</th>
<th>SOME</th>
<th>A BIT</th>
<th>QUITE</th>
<th>VERY MUCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your unit supervisor?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Other unit members or co-workers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>People outside of your unit?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Q-25. After you finish your part of the work, how much do you have to rely upon each of the following people to perform the next steps in the process before the total task or service is completed? 

<table>
<thead>
<tr>
<th>Likely to Depend</th>
<th>NOT AT ALL</th>
<th>A LITTLE</th>
<th>SOME</th>
<th>A BIT</th>
<th>QUITE</th>
<th>VERY MUCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your unit supervisor?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Other unit members or co-workers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>People outside of your unit?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Q-26. During the past 3 months, how often did you receive or send written reports or memos related to your work from or to each of the following people?

<table>
<thead>
<tr>
<th>Likely to Send</th>
<th>NOT AT ALL</th>
<th>A LITTLE</th>
<th>SOME</th>
<th>A BIT</th>
<th>QUITE</th>
<th>VERY MUCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between you and unit members?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Among unit members?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Between you and people outside of your unit?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

---

Go to next page
Q-27. During the past 3 months, how often did work-related discussions (face-to-face or by telephone) occur on a one-to-one basis?

<table>
<thead>
<tr>
<th>HOW OFTEN HAD WORK DISCUSSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN THE PAST 3 MONTHS</td>
</tr>
<tr>
<td>ABOUT 1-3</td>
</tr>
<tr>
<td>TIMES 1-3</td>
</tr>
<tr>
<td>TIMES 1-3</td>
</tr>
<tr>
<td>TIMES EVERY 1-3 LONG</td>
</tr>
<tr>
<td>ONCE A MONTH</td>
</tr>
<tr>
<td>A WEEK A DAY</td>
</tr>
<tr>
<td>HOUR</td>
</tr>
<tr>
<td>a. Your unit supervisor?</td>
</tr>
<tr>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>b. Other unit members or co-workers?</td>
</tr>
<tr>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>c. People outside of your unit?</td>
</tr>
<tr>
<td>1  2  3  4  5</td>
</tr>
</tbody>
</table>

Q-28. During the past 3 months how often were you involved in special group problem solving meetings with:

<table>
<thead>
<tr>
<th>HOW OFTEN HAD WORK DISCUSSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN PAST 3 MONTHS</td>
</tr>
<tr>
<td>ABOUT ONCE</td>
</tr>
<tr>
<td>ABOUT EVERY</td>
</tr>
<tr>
<td>ABOUT 2-4</td>
</tr>
<tr>
<td>ABOUT A DAY</td>
</tr>
<tr>
<td>NOT ONCE A MONTH</td>
</tr>
<tr>
<td>A WEEK A WEEK OR MORE</td>
</tr>
<tr>
<td>a. Two or more people from your unit?</td>
</tr>
<tr>
<td>1  2  3  4  5  6</td>
</tr>
<tr>
<td>b. Two or more people from outside of your unit?</td>
</tr>
<tr>
<td>1  2  3  4  5  6</td>
</tr>
</tbody>
</table>

Q-29. How often were regularly scheduled staff meetings held among people in your unit?

<table>
<thead>
<tr>
<th>HOW OFTEN HAD WORK DISCUSSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN THE PAST 3 MONTHS</td>
</tr>
<tr>
<td>ABOUT ONCE</td>
</tr>
<tr>
<td>ABOUT EVERY</td>
</tr>
<tr>
<td>ABOUT 2-4</td>
</tr>
<tr>
<td>ABOUT A DAY</td>
</tr>
<tr>
<td>NOT ONCE A MONTH</td>
</tr>
<tr>
<td>A WEEK A WEEK OR MORE</td>
</tr>
<tr>
<td>1  2  3  4  5  6</td>
</tr>
</tbody>
</table>

Q-30. During the past 3 months how often did disagreements or arguments occur?

<table>
<thead>
<tr>
<th>HOW OFTEN DISAGREEMENTS OR ARGUMENTS OCCURRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOT ONCE A MONTH 2 WEEKS A WEEK OR EVERY</td>
</tr>
<tr>
<td>a. Between unit members and your supervisors?</td>
</tr>
<tr>
<td>1  2  3  4  5  6</td>
</tr>
<tr>
<td>b. Among unit members?</td>
</tr>
<tr>
<td>1  2  3  4  5  6</td>
</tr>
<tr>
<td>c. Between people in your unit and people outside of your unit?</td>
</tr>
<tr>
<td>1  2  3  4  5  6</td>
</tr>
</tbody>
</table>

Go to next page
Q-31. In general, when these disagreements or arguments occurred, how often were they handled in each of the following ways during the past three months?

<table>
<thead>
<tr>
<th>HOW OFTEN DISPUTES RESOLVED THIS WAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALMOST</td>
</tr>
<tr>
<td>ABOUT HALF</td>
</tr>
<tr>
<td>VERY</td>
</tr>
<tr>
<td>NEVER</td>
</tr>
<tr>
<td>Seldom</td>
</tr>
<tr>
<td>THE TIME</td>
</tr>
<tr>
<td>OFTEN</td>
</tr>
<tr>
<td>OFTEN</td>
</tr>
</tbody>
</table>

1  2  3  4  5

<table>
<thead>
<tr>
<th>a. By ignoring or avoiding the issues?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>b. By smoothing over the issues?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>c. By bringing the issues out in the open and working them out among the parties involved?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>d. By having a higher-level supervisor resolve the issues between the people involved?</th>
</tr>
</thead>
</table>

How I want to ask you some questions about yourself to help interpret the results of this study.

Q-32. How many years have you worked with medical surgical patients? (Fill in number of years)

__________ Years

Q-33. How many years have you worked in this hospital?

__________ Years

Q-34. How many years have you worked on this unit?

__________ Years

Q-35. What is the highest educational degree you obtained in school?

<table>
<thead>
<tr>
<th>HIGH SCHOOL DIPLOMA</th>
<th>VOCATIONAL DIPLOMA</th>
<th>COLLEGE DIPLOMA</th>
<th>ASSOCIATE DEGREE</th>
<th>BACHELORS DEGREE</th>
<th>MASTERS DEGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
Q-36. What year did you graduate with this degree? (Fill in numbers for year of graduation).

19

Q-37. What is your highest level of nursing education? (Circle number)

<table>
<thead>
<tr>
<th>Degree Level</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical Nurse</td>
<td>1</td>
</tr>
<tr>
<td>Diploma Nurse</td>
<td>2</td>
</tr>
<tr>
<td>College Nurse</td>
<td>3</td>
</tr>
<tr>
<td>Certificate Hospital</td>
<td>4</td>
</tr>
<tr>
<td>Bachelors Degree</td>
<td>5</td>
</tr>
<tr>
<td>Masters Degree</td>
<td>6</td>
</tr>
</tbody>
</table>

Q-38. What year did you graduate with the above degree? (Fill in number for year of graduation).

19

Q-39. How many hours do you normally work per week? (Fill in number of hours.

___ Hours
APPENDIX G

Internal Consistency of OAI Subscales
TABLE 16. Internal Consistency of the O.A.I. Unit Work Structure and Process Subscales calculated from the nurse sample (N=158) pretest.

<table>
<thead>
<tr>
<th>Subscale measured</th>
<th>Items included in index</th>
<th>Coefficient Alpha observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work Difficulty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. analyzability</td>
<td>M-3 (S-3)</td>
<td></td>
</tr>
<tr>
<td>b. predictability</td>
<td>M-4 (S-4)</td>
<td>.57</td>
</tr>
<tr>
<td></td>
<td>M-6 (S-6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-7 (S-7)</td>
<td></td>
</tr>
<tr>
<td>2. Work Variability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. patient similarity</td>
<td>M-1 (S-1)</td>
<td></td>
</tr>
<tr>
<td>b. consistency of problems</td>
<td>M-2 (S-2)</td>
<td></td>
</tr>
<tr>
<td>c. frequency of exception</td>
<td>M-5 (S-5)</td>
<td>.67</td>
</tr>
<tr>
<td>3. Number of Job Titles and Positions</td>
<td>S-11*</td>
<td></td>
</tr>
<tr>
<td>4. Unit Specialization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Staff Development</td>
<td>M-8 (S-8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-9 (S-9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-10 (S-10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-35*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-37*</td>
<td></td>
</tr>
<tr>
<td>b. role inter-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>changeability</td>
<td>M-11 (S-12)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-12 (S-13)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-13 (S-14)</td>
<td>.58</td>
</tr>
<tr>
<td></td>
<td>S-15</td>
<td></td>
</tr>
<tr>
<td>5. Unit Standardization</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-19 (S-26)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-20 (S-27)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-21 (S-28)</td>
<td>.59</td>
</tr>
<tr>
<td></td>
<td>S-29*</td>
<td></td>
</tr>
<tr>
<td>6. Distribution of Unit Authority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Unit member authority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tasks</td>
<td>M-14c* (S-16c)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-16c (S-18c)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-22 (S-30c)</td>
<td>.78</td>
</tr>
<tr>
<td>b. Head Nurse Authority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tasks</td>
<td>M-14b* (S-16b)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-16b (S-22b)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-22b (S-30b)</td>
<td></td>
</tr>
<tr>
<td>c. Unit Group Authority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tasks</td>
<td>M-14d* (S-16d)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-16d (S-18d)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-22d (S-30d)</td>
<td></td>
</tr>
<tr>
<td>d. External Authority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tasks</td>
<td>M-14a (S-16a)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-16a (S-18a)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-22a (S-30a)</td>
<td></td>
</tr>
</tbody>
</table>

(continued...
7. Job Dependence on Head Nurse
   a. input M-23a (S-32a)
   b. process M-24a (S-34b)
   c. output M-25a (S-33b)

8. Job Dependence among Unit Members
   a. input M-23b (S-32b)
   b. process M-24b (S-34b)
   c. output M-25b (S-33b)

9. Job Dependence on Other Units
   a. input M-23c (S-32c)
   b. process M-24c (S-33c)
   c. output M-25c (S-34c)

10. Work Flow Inter-dependence S-35* 

11. Unit Information Flows
    a. supervisor to staff M-26a (S-35a)
       M-27a (S-36a)
    b. among staff M-26b (S-35b)
       M-27b (S-36b)
    c. outside unit M-26c (S-35c)
       M-27c (S-36c)
       M-28b (S-35b)

12. Group Based Incentives
    a. rewards S-23a
    b. sanctions S-24a

13. Individual Based Incentives
    a. rewards S-23b*
    b. sanctions S-24b*

14. Group Pressure to Conform
    a. staff gangs up/lager M-18b (S-25b*)
    b. staff gangs up on ratebusters M-18c (S-25c*)
    c. encourage higher individual performance M-18d (S-25d*)
    d. staff compete M-18a (S-25a*)

15. Frequency of Conflict S-30

16. Methods Used to Resolve Conflict
    a. by avoiding or ignoring M-31a (S-40a*)
    b. by smoothing over M-31b (S-40b*)
    c. by confronting M-31c (S-40c*)
    d. by resorting to higher authority M-31d (S-40d*)

*Items not appropriate for correlation due to insufficient sample (such as items contained only 4 supervisor questionnaires) or construction which requires qualitative analysis.
APPENDIX H

Original OAI Subscale Items
The 1980 Versions and Subsequent Revisions of the OAI Subscale Items that Were Altered for This Study

The original 1980 Subscale items for variability, difficulty and standardization are as follows:

Variability:
1. To what extent do you perform the same tasks from day to day?
2. How much the same are the day-to-day situations, problems or issues encountered in performing your major tasks?
3. During a normal work week, how frequently do exceptions arise in your work which require substantially different methods or procedures for doing it?

Difficulty:
1. How easy is it for you to know whether you performed your work correctly?
2. What percent of the time are you generally sure of what the outcomes of your work efforts will be?
3. In the past three months, how often did difficult problems arise in your work which require substantially different methods or procedures for doing it?
4. About how much time did you spend solving these work problems?

**Standardization:**

1. How specific or general are the rules, policies, and procedures in your unit for coordinating and controlling the work activities of all unit personnel?
2. How often did unit members violate or ignore these rules, policies, or procedures during the past three months?
3. How strictly are these operating rules, policies or procedures enforced on your unit?

The revised variability and difficulty subscale items for the first OAI pretest are as follows.

**Variability:**

1. To what extent do you care for similar patients from day to day?
2. From day to day, how much the same are your patients nursing diagnoses or problems?
3. During a normal work week, how frequently are you confronted by unusual patient problems or needs which require substantially different approaches or interventions?

**Difficulty:**

1. How easy is it for you to know whether you care for your patients correctly?

2. What percent of the time are you generally sure of what the outcomes of your clinical efforts will be?

3. In the past 3 months, how often did difficult problems arise while caring for patients for which there was no immediate or apparent solutions?

4. About how much time did you spend solving these work problems?

The variability and standardization subscale items that were revised for the third pretest, are contained in the OAI used for this study.
APPENDIX I

Letters Documenting Permission to Use Instruments
February 1, 1990

Ms. Deborah Briner
3653 Fairdale Drive
Fairfield, OH 45014

Dear Ms. Briner:

Thank you for your letter and materials describing the use of the GAI in measuring the work unit structures of medical-surgical units. You have my permission to use the GAI unit member and unit supervisor’s questionnaires as part of your dissertation free of charge, provided that you provide me a copy of your research results (presumably, your dissertation). In this way, I will be able to establish norms on the GAI for different organizations, work groups, and jobs. This will enhance the generality of the instruments.

I was impressed by your pilot study efforts to test the measurement properties of the GAI in your medical-surgical units. Your findings about the different interpretations of a work as stable or mobile in the instruments is again reflected in the importance of using this kind of systematic pilot studies of the GAI in the specific contexts in which it will be used. Thus, I assigned your revisions of the GAI for your specific study.

With regard to the unit work flow questions (Q-35) in the supervisor questionnaire, I have found it helpful to include pictures for each of the independent, sequential, rearranged, and team work flow cases (as published in our 1985 book). Would it help to include these pictures with your questions? Perhaps your pilot study suggests there is no need for these pictures.

Beyond this, no other issues or suggestions become evident as I reviewed your drafts of the modified GAI questionnaires. However, if problems arise, feel free to call me. Best wishes in your dissertation.

Sincerely,

[Signature]

Andrew W. Van de Ven
January 18, 1991

Deborah Brinker, R.N., M.S.N.
5893 Fairdale Drive
Fairfield, Ohio 45014

Dear Ms. Brinker:

You have our permission to reproduce and use the OARS/HFAQ for the purposes stated in your letter. We have one requirement and one suggestion. The requirement is that the Duke Center copyright appear on the face of all reproductions of the instrument and that any modifications of the instrument must also be noted on the face page, reported to us, and noted in publication of results.

The suggestion is that you keep in touch with us as your work progresses. There are over 150 users of the OARS/HFAQ nationwide. You may want to be in touch with other users with interest similar to your own.

The person with whom you would correspond in the future about OARS is Gerda Fillenbaum. You can write to her at Box 3003, Duke University Medical Center, Durham, NC 27710.

Sincerely,

Harvey Jay Cohen, M.D.
Professor of Medicine
Chief, Geriatrics Division
Center Director
Director, GRECC/VAMC

HJC/pj
Permission to Reprint is hereby granted to: Ms. Deborah Brinker, 5893 Fairdale Drive, Fairfield, OH 45014


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This application and approval contain all the terms relating to said permission to reprint.

Date of approval 10/30/92

Approved: Administrative Science Quarterly

By: Karen D. Lewis, Business Manager
APPENDIX J

ADL Scale
ACTIVITIES OF DAILY LIVING

Now I'd like to ask you about some of the activities of daily living, things that we all need to do as part of our daily lives. I would like to know if you can do these activities without any help at all, or if you need some help to do them, or if you can't do them at all. (BE SURE TO READ ALL ANSWER CHOICES IF APPLICABLE IN QUESTIONS 1. THROUGH 14. TO RESPONDENT.)

Instrumental ADL

1. Can you use the telephone....
   2 without help, including looking up numbers and dialing;
   1 with some help (can answer phone or dial operator in an emergency, but need a special phone or help in getting the number or dialing); or
   0 are you completely unable to use the telephone?
   - Not answered

2. Can you get to places out of walking distance....
   2 without help (drive your own car, or travel alone on buses, or taxis);
   1 with some help (need someone to help you or go with you when traveling) or;
   0 are you unable to travel unless emergency arrangements are made for a specialized vehicle like an ambulance?
   - Not answered

Copyright 1975 Duke University Center for the Study of Aging and Human Development. All rights reserved.
4. Can you prepare your own meals....
   2 without help (plan and cook full meals yourself);
   1 with some help (can prepare some things but
      unable to cook full meals yourself); or
   0 are you completely unable to prepare any meals?
     - Not answered

5. Can you do your housework....
   2 without any help (can clean floors, etc.);
   1 with some help (can do light housework but need
      help with heavy work); or
   0 are you completely unable to do any housework?
     - Not answered

6. Can you take your own medicine....
   2 without help (in the right dose at the right
      time);
   1 with some help (able to take medicine if someone
      prepares it for you and/or reminds you to take
      it); or
   0 are you completely unable to take your medicine?
     - Not answered

7. Can you handle your own money....
   2 without any help (write checks, pay bills, etc.);
   1 with some help (manage day-to-day buying but
      need help with managing your checkbook and
      paying your bills); or
   0 are you completely unable to handle your money?
     - Not answered

Physical ADL

8. Can you eat....
   2 without help (able to feed yourself completely);
   1 with some help (need help with cutting, etc.); or
   0 are you completely unable to feed yourself?
     - Not answered
9. Can you dress and undress yourself....
   2 without help (able to pick out clothes, dress and undress yourself);
   1 with some help or
   0 are you completely unable to dress and undress yourself?
   - Not answered

10. Can you take care of your own appearance, for example combing your hair and (for men) shaving....
   2 without help;
   1 with some help or
   0 are you completely unable to maintain your appearance yourself?
   - Not answered

11. Can you walk....
   2 without help (except from a cane);
   1 with some help from a person or with the use of walker, or crutches, etc.; or
   0 are you completely unable to walk?
   - Not answered

12. Can you get in and out of bed....
   2 without any help or aids;
   1 with some help (either from a person or with the aid of some device); or
   0 are you totally dependent on someone else to lift you?
   - Not answered

13. Can you take a bath or shower....
   2 without help;
   1 with some help (need help getting in and out of the tub, or need special attachments on the tub); or
   0 are you completely unable to bathe yourself?
   - Not answered
14. Do you ever have trouble getting to the bathroom on time?

2 No
1 Yes
0 Have a catheter or colostomy
   - Not answered

(IF "YES" ASK a.)
   a. How often do you wet or soil yourself (either day or night?)
      1 Once or twice a week
      0 Three times a week or more
      - Not answered

15. Is there someone who helps you with such things as shopping, housework, bathing, dressing, and getting around?

1 Yes
0 No
   - Not answered

(IF "YES" ASK a. AND b.)
   a. Who is your major helper?

__________________________
   Relationship__________________________

b. Who else helps you?

__________________________
   Relationship__________________________
APPENDIX K

Nursing Unit Information Form
NURSING UNIT INFORMATION

1. What is the unit's bed capacity? (FILL IN NUMBER OF BEDS) ____________

2. What was the unit's average daily census during the past year? ____________

3. What percent of these patients were age 65 or older? ____________

4. For the patients admitted to this unit, what is the average length of stay? (FILL IN NUMBER OF DAYS) ____________

5. What is the average length of stay for patients who are age 65 or older? ____________

6. Excluding the head nurse position, how many F.T.E.s are budgeted in staff positions for this unit? (FILL IN NUMBER OF F.T.E.S) ____________

7. How many F.T.E.s, excluding the head nurse position, are currently filled? ____________
8. During the past year, how many staff have resigned or transferred from this unit in this past year? (FILL IN NUMBER OF F.T.E.s) ______________

7. (CALCULATE TURNOVER__________)

\[
\text{TURNOVER} = \frac{\# \text{ F.T.E., BUDGETED}}{\# \text{ RESIGN OR TERM.}}
\]

8. Are agency staff used on this unit? (CIRCLE NUMBER NEXT TO ANSWER) 1 Yes 2 No

9. What approach to nursing practice does this unit follow?

1 Functional nursing
2 Total Patient Care
3 Team Nursing
4 Primary nursing
January 2, 1991

Case Western Reserve University
Frances Payne Bolton School of Nursing
2121 Abington Road
Cleveland, Ohio 44106

Dear Nurse Colleague:

As a graduate student from Case Western Reserve University, I am studying the structure of hospital nursing units and exploring units differences in terms of their patient's needs and functional outcomes. The purpose of this study is to describe the relationships between nursing staff structure and the needs and characteristics of patients.

I would like you to participate in this study by taking 15-20 minutes to answer questions about your unit and the kinds of patients you care for. By answering the questions you will be providing information that is vital to furthering our understanding of the relationships between nursing unit structure and patient outcomes. You will also be reading questions that may stimulate thought and increase your understanding of the complexity of your work.

Information obtained about you as an individual will be kept confidential. Do not write your name on the questionnaire. The study will collate responses for groups rather than individuals and report responses as numbers or general characteristics. Details that would enable your unit to be recognized will not be revealed.

There are no anticipated risks to you for participating or not participating. Your participation is completely voluntary and will be kept confidential. At no time will participating individuals be identified.

By completing the attached questionnaire you will indicate your consent for participation in this study. After completion, place the questionnaire in the attached envelope. If you do not wish to participate in this study, please return the questionnaire unanswered. As discussed, I will return later for the envelope.

Thank you for taking the time to read this. I hope you will be interested in completing the questionnaire. If you have any questions about the study, you can reach me per phone at 829-3704.

Sincerely,

Deborah Brinker, R.N.,M.S.N.
APPENDIX L

Patient Consent Form And Letter
To: The Physician of ______________________

From: Deborah Brinker R.N., M.S.N.

I am a Phd. candidate from the Frances Payne Bolton School of Nursing at Case Western Reserve University. My dissertation is a descriptive study on the structure of hospital nursing units in relation to the functional needs of elderly patients.

Your patient may be included in my study by consenting to participation in two 15 minute interviews. These interviews, will consist of questions about your patients ability to perform activities of daily living.

Your patient will be informed that participation is voluntary and may be discontinued at any time during the interviews. I will also inform your patient that I will keep his or her choice regarding participation as well his or her responses to my questions confidential.

I realize you are very busy and appreciate your taking the time to read this. If you have questions about my study or would like additional information please call me at 829-1704.
A Study of Hospital Nursing Units and the Needs of Elderly Patients

My name is Deborah Brinker. I am a Phd. student in nursing from the Frances Payne Bolton School of Nursing at Case Western Reserve University. I am conducting research on the characteristics of hospital nursing units in relation to the needs of elderly patients.

To better meet the needs of elders, hospitals are looking at different staffing arrangements for nursing units. Before decisions can be made however, information from patients such as yourself, is necessary to better understand patient needs.

Participation in this study consists of two 15 minute interviews about your activities of daily living and your needs for assistance. If you agree to participate, the first interview will occur now. The second interview will be by phone when you go home. The information you provide will be kept confidential. Your responses will be combined with those of other patients and never be reported with your name in any report of this study.

I hope you will be interested in participating in the interviews. The information you provide is vital to furthering our understanding of the needs of hospitalized elders. If you have questions about the study or would like additional information please call me at 558-2255.
NURSING UNIT WORK AND STRUCTURE
CONSENT TO ACT AS A RESEARCH PARTICIPANT

Before agreeing to participate in this study, it is important that the following explanation of the procedures be read and understood. It describes the purpose, procedures, benefits, risks and precautions that may be associated with the study. It also describes the right to withdraw from the study at any time. It is also understood that refusal to participate in this study will not influence the nursing care you are receiving.

Purpose:
The purpose of this study is to describe the relationship between nursing staff structure and the needs and characteristic of patients.

Participation:
If you agree to participate you will be interviewed twice, first today and then again before you are discharged from the hospital. Each interview will take approximately 15 minutes. The questions asked during your interview will be about your daily activities and the amount of assistance you need in performing them. When you agree to participate, additional information about the length of your hospitalization and initial care needs will be obtained from your medical record.

Compensation:
You will not be compensated for your participation.
Benefits and Risks:
The information you provide by answering the interview questions is vital to helping nurses learn about patient needs in relation to the structure of their nursing units. I cannot guarantee that there will be any immediate benefits to you for answering the interview questions, and there are no anticipated risks to you for participating or not participating. The information you provide will never be recorded with your name. Your answers to the questions will be combined with those obtained from other patients and then reported as a group. Your choice to participate and your answers to the questions will not be shared with the staff that care for you.

If you have any questions about this study, you may reach me per phone at (513)829-3704. To indicate consent for participation as just described, please read and sign the following.

CONSENT TO ACT AS A RESEARCH PARTICIPANT

I _______________________ agree to participate in this study. I will begin and complete my participation on ___/___/____.

__________________________          ________________
Signature of Investigator           Date
APPENDIX M

Patient Demographic Information Form
DEMOGRAPHIC INFORMATION

CASE I.D. __________

DATE __________

The following information is to be obtained from the patients' medical record.

1. Age on last birthday (fill in years) ________ years.

2. Sex (circle)
   A. Male
   B. Female

3. List the admitting medical diagnoses charted by the physician:
   Primary -- __________________________________________
   Other -- __________________________________________
   __________________________________________
   __________________________________________

4. Number of days hospitalized this admission (do not include day of discharge)
   _________ days
APPENDIX N

Changes In ADL and IADL
Table 20. Admission and Discharge Comparison of the Number of Patients Who Were Able to Function Independently, Those Who Needed Some Assistance and Those Who Were Totally Incapable of: Cooking, Obtaining Transportation, Shopping and Cleaning.

**COOKING**

<table>
<thead>
<tr>
<th>ABILITY</th>
<th>NUMBER OF PATIENTS ON ADMISSION</th>
<th>NUMBER OF PATIENTS AT DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely Unable</td>
<td>9</td>
<td>33</td>
</tr>
<tr>
<td>With Some Help</td>
<td>19</td>
<td>40</td>
</tr>
<tr>
<td>Without Help</td>
<td>75</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>103</strong></td>
<td><strong>103</strong></td>
</tr>
</tbody>
</table>

**DRIVE**

<table>
<thead>
<tr>
<th>ABILITY</th>
<th>NUMBER OF PATIENTS ON ADMISSION</th>
<th>NUMBER OF PATIENTS AT DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely Unable</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>With Some Help</td>
<td>32</td>
<td>79</td>
</tr>
<tr>
<td>Without Help</td>
<td>69</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>103</strong></td>
<td><strong>103</strong></td>
</tr>
</tbody>
</table>
### Shop

<table>
<thead>
<tr>
<th>ABILITY</th>
<th>NUMBER OF PATIENTS ON ADMISSION</th>
<th>NUMBER OF PATIENTS AT DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely Unable</td>
<td>15</td>
<td>67</td>
</tr>
<tr>
<td>With Some Help</td>
<td>28</td>
<td>30</td>
</tr>
<tr>
<td>Without Help</td>
<td>60</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>103</td>
<td>103</td>
</tr>
</tbody>
</table>

### Clean

<table>
<thead>
<tr>
<th>ABILITY</th>
<th>NUMBER OF PATIENTS ON ADMISSION</th>
<th>NUMBER OF PATIENTS AT DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely Unable</td>
<td>14</td>
<td>62</td>
</tr>
<tr>
<td>With Some Help</td>
<td>36</td>
<td>34</td>
</tr>
<tr>
<td>Without Help</td>
<td>53</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>103</td>
<td>103</td>
</tr>
</tbody>
</table>
Figure 6. Number of Patients who Changed From Admission to Discharge For Each IADL Item

Items: 1 = phone, 2 = transportation, 3 = shop, 4 = cook, 5 = clean, 6 = medicate, 7 = money
Figure 7. Number of Patients who Changed From Admission to Discharge For Each ADL Item

Number of Patients

0 1 2 3 4 5 6 7
ADL Items

Items: 1 = eat, 2 = dress, 3 = hair, 4 = walk, 5 = get out of bed, 6 = bath
Figure 8. Comparison of Admission and Discharge Functional Health Scores For Each Nursing Unit
APPENDIX O

Regression Coefficients and t Values for

Variables in Regression Equations
Table 23. Functional Health at Discharge (FHD) as the Dependent Variable, Functional Health on Admission (FHA) as the Covariate and Work Variability (VAR) and Staff Specialization (SPECIAL) as the Independent Variables.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>REGRESSION COEFFICIENT</th>
<th>STANDARD ERROR</th>
<th>t VALUE</th>
<th>t SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHA</td>
<td>0.25</td>
<td>0.18</td>
<td>1.42</td>
<td>.18</td>
</tr>
<tr>
<td>VAR</td>
<td>1.13</td>
<td>1.08</td>
<td>1.05</td>
<td>.31</td>
</tr>
<tr>
<td>SPECIAL</td>
<td>-2.33</td>
<td>1.58</td>
<td>-1.48</td>
<td>.16</td>
</tr>
</tbody>
</table>
Table 26. Functional Health at Discharge (FHD) as the Dependent Variable, Functional Health on Admission (FHA) as the Covariate and Work Variability (VAR) and Standardization (STANDARD) as the Independent Variables.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>REGRESSION COEFFICIENT</th>
<th>STANDARD ERROR</th>
<th>t VALUE</th>
<th>t SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHA</td>
<td>.27</td>
<td>.19</td>
<td>1.44</td>
<td>.17</td>
</tr>
<tr>
<td>VAR</td>
<td>1.11</td>
<td>1.18</td>
<td>.94</td>
<td>.36</td>
</tr>
<tr>
<td>STANDARD</td>
<td>.91</td>
<td>1.7</td>
<td>.54</td>
<td>.6</td>
</tr>
</tbody>
</table>
Table 29. Functional Health at Discharge (FHD) as the Dependent Variable, Functional Health on Admission (FHA) as the Covariate and Work Difficulty (DIFF) and Distribution of Authority to Staff (AUTHOR) as the Independent Variables.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>REGRESSION COEFFICIENT</th>
<th>STANDARD ERROR</th>
<th>t VALUE</th>
<th>t SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHA</td>
<td>.34</td>
<td>.18</td>
<td>1.88</td>
<td>.07</td>
</tr>
<tr>
<td>DIFF</td>
<td>2.16</td>
<td>2.58</td>
<td>.83</td>
<td>.42</td>
</tr>
<tr>
<td>AUTHOR</td>
<td>-.34</td>
<td>1.33</td>
<td>-.25</td>
<td>.8</td>
</tr>
</tbody>
</table>