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**Clinical and organizational impact of multiple changes in critical
care: A case study**

Mitchell, Pamela Holsclaw, Ph.D.

University of Washington, 1991

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Clinical and Organizational Impact of Multiple Changes

In Critical Care: A Case Study

by

Pamela Holsclaw Mitchell

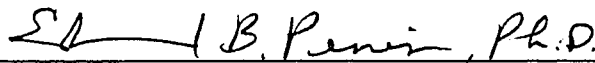
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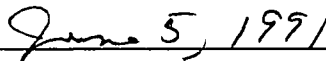


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Abstract

Clinical and Organizational Impact of Multiple Changes
In Critical Care: A Case Study

by Pamela Holsclaw Mitchell

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This research evaluated the impact of a natural cluster of change in one community hospital division on clinical and organizational performance of the hospital's critical care units. Changes were comprised of those in physical facilities of the critical care units, in technology and in divisional leadership. Their combined impact was evaluated by comparing post change data to an existing database of nurse and physician perceptions of the critical care units and of patient care outcomes. Variables of interest included selected indices of critical care unit clinical performance (mortality and patient satisfaction with nursing care) and critical care unit organizational performance (nursing retention, nurse and physician ratings of unit effectiveness, patient length of stay, and nurse perceptions of the work environment and beliefs about role in patient welfare). These effects were interpreted from differing theoretical points of view : the system-structural viewpoint that emphasizes the value of formal structure in stabilizing organizations during change, and the strategic choice perspective that emphasizes the social creation of meaning surrounding organizational events. Data were obtained through written surveys, interviews, participant observation, and medical records, with data collected in 1986-87 compared to those obtained in 1990.

Because the first line nursing managers remained constant, the system-structural perspective predicted that the multiple divisional changes would have no effect on clinical and organizational performance. These hypotheses were supported in that

patient mortality ratio remained below 60 percent of predicted; patient satisfaction with nursing care remained high; nursing retention did not drop significantly; nursing satisfaction did not change significantly. Patient length of stay did decrease significantly, which is consistent with improved efficiency of unit functioning.

There was also support for the hypotheses derived from the strategic choice perspective. This view, as expressed in the concept of constructed organizational meaning, posits that unit-level attributes, such as beliefs and values will change to the extent that environmental changes induce differences in the meaning that staff assign to these changes. Unit nurses' aggregate ratings of beliefs about the meaning and importance of their work did not change over time, despite the influx of a large number of new staff nurses. Interviews suggested that staff devoted considerable energy to maintaining the values of high standards of patient care, hard work and of being part of a professional team.

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CHAPTER I
WHEN EVERYTHING IS IN FLUX, DOES ANYTHING MATTER?

The world's a scene of changes, and to be
Constant, in Nature were inconstancy.

(Abraham Cowley, *Inconstancy*, 1647)

The universal human yearning for something permanent, enduring,
without shadow of change.

(Willa Cather, *Death Comes to the Archbishop*, Book III,
Chapter 3, 1927)

Both the constancy of change and our resistance to it are enduring themes in literature depicting the human condition. They are equally persistent themes in the practical and theoretical organizational literature. Accounts that evaluate effects of specific planned changes in individual organizations rarely acknowledge the continually changing internal and external environments of those organizations. For example, organizational investigators have examined the effects of leader succession on subsequent organizational performance, as one kind of change. But they have not estimated the effect of leadership change *within* the context of other *ongoing* change. Finally, no one has studied the combined effects of multiple changes in technology, physical environment and leadership in health care organizations -- widely acknowledged to be in one the most volatile organizational and political environments of all. Meyer (1975, p.517) suggests that this situation exists because of theoretic paralysis: "...bureaucratic theory de-emphasizes leadership because nothing changes and contemporary organization theory de-emphasizes leadership because everything is in flux."

The research that is the focus of this dissertation capitalizes on a natural cluster of events in a community hospital. Numerous changes in physical facilities, technology and leadership in one clinical services division were evaluated with

respect to an existing database of nurse and physician perceptions of critical care. A triangulated case study design (Denzin, 1970; Campbell, 1975; Jick, 1979) was used to evaluate the effects of these multiple changes on selected indices of critical care unit *clinical performance* (mortality and patient satisfaction with nursing care) and nursing work unit *organizational performance* (nursing retention, nurse and physician ratings of unit effectiveness, and patient length of stay).

These effects are evaluated primarily from the perspective of the critical care unit nurses, within the context of the community hospital where the critical care units exist. They are interpreted from the viewpoints of differing theoretical perspectives: system-structural and strategic choice (Astley & Van de Ven, 1983).

The *system-structural* view is based upon a relatively deterministic view of knowledge and human functioning that assumes discoverable regularities in individual and group behavior. The organization's structures (such as its locus of authority, formalization of rules and kinds of coordination) constrain or determine individual or group response to external or internal changes. For example, this view would incorporate Thompson's (1967) position that the hospital as an organization is structured so as to protect the technical core (in this case the patient care units) from turbulence in the institutional and external environment, with the unit-level managers being key persons to provide this protection. If this were so for the case studied, we should not expect to see much difference in patient care outcomes, or nursing staff turnover or satisfaction, despite considerable change at the middle and executive administrative levels in the patient care services department and in the nature of clinical services offered. In a larger sense, the system-structural view suggests that formal structures promote considerable inertia, and that this inertia promotes resistance to change (Hannan & Freeman, 1984; Shortell, Morrison, Friedman, 1990)

The system-structural view would suggest that the change in leadership exerted no

more or less influence than the changes in technology or physical plant. Bureaucracies are constructed to minimize the impact of individual occupants of leadership positions; therefore, in this view, specific persons who are leaders exert relatively little influence over work unit level outcomes (Lieberson & O'Connor, 1972; Bryman, 1986). Further, if the appropriate structures were in place, mechanisms for handling change in technology and physical environment would follow naturally.

The *strategic choice* perspective posits that organizations and the people in them are not entirely determined by the structures of their organizations or by their environments, but rather that they have choices about both the changes made and the meaning they assign to change. This view suggests individual leaders are crucially important to the overall change process in that they manage the "enactment" of organizational environment by the organizational members, through construction or maintenance of shared meanings about its structure and processes. These meanings are critical in overcoming individuals' natural resistance to change (Smith & Peterson, 1988; Pfeffer, 1981; Smircich, & Morgan, 1982). For example, if key leaders are carriers of the *organizational ideology, or symbolism*, as proposed by Stotland & Kobler (1965), and if the particular ideology is important in maintaining a sense of viability in a hospital, change in leadership could affect staff morale, and ultimately patient well being if the new leadership either does not accept the ideology, or is unable to continue to make it operational.

THE RESEARCH PROBLEM

This research is drawn from a database initially collected to provide an intensive description of the functioning of two critical care nursing units over time in a suburban hospital typical in size and type of most in the United States. Three middle and executive level nursing administrators resigned within a short period

of time prior to a planned remeasurement of the database. Initially, this appeared to provide an opportunity for a natural experiment, allowing evaluation of the impact of leader change on a variety of indices of work unit-level organizational and clinical performance. However, this change in nursing administrative leaders also was embedded in a series of ongoing and escalating changes in the patient care services division that directly affected critical care. Therefore, what was initially considered a study of changing leadership became a study of multiple changes within a hospital clinical division, focusing on the impact on patients and nurses in the critical care units.

Suburban Community Hospital and Its Critical Care Units

Suburban Community Hospital (SCH) is a medium sized, private, not-for-profit hospital, serving a growing suburb of a major metropolis in the Far West. It opened in 1960 with 56 beds (Eastside..., 1982). The state regulatory agency licensed SCH for 218 beds by 1982, and allowed expansion to 235 beds by 1990. The hospital claimed to have the busiest emergency room in its area by 1982, with qualifications for American College of Surgeons Level II Trauma Center designation (Wilson, 1983). This service led to an increasing emphasis on critical care inpatient services.

Nursing services are provided through the Patient Care Services Division. As shown in Figure I.1, the Patient Care Services Division is one of seven divisions in the hospital reporting directly to the President and Chief Executive Office (CEO). The chief nursing administrator is one of two Senior Vice Presidents in the

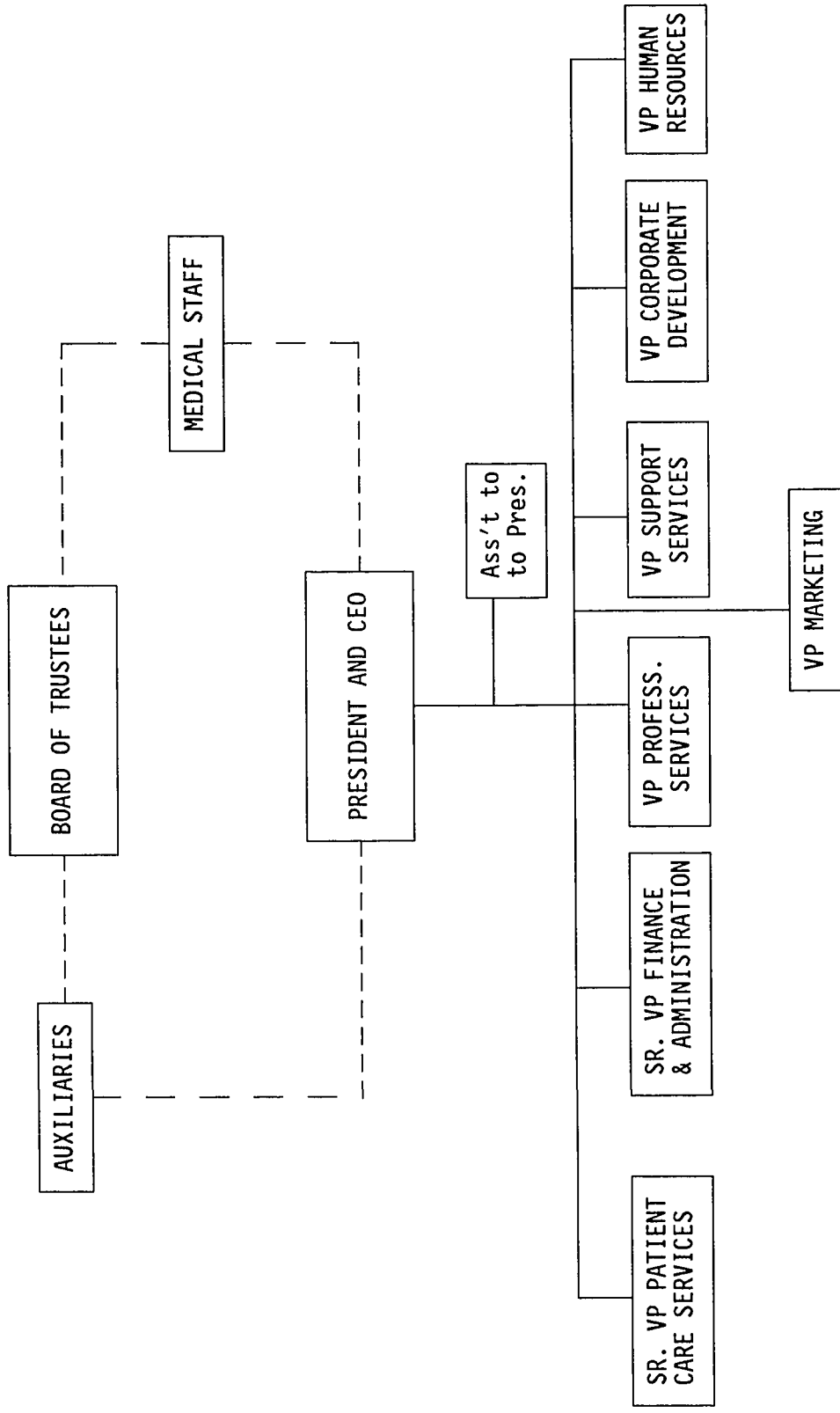


FIGURE I.1 SUBURBAN COMMUNITY HOSPITAL ORGANIZATIONAL CHART

organization. All of the planned and unplanned changes that affected the critical care units occurred in the Patient Services Division. The other divisions are professional services (such as medical records, imaging), finances, support services (such as central supply and purchasing), and human resources (personnel, education).

The Patient Care Services division is responsible for nursing services in all clinical hospital units and the operating room, as well as for pharmacy, social work and psychiatry services. The chief nursing officer administers this division as a Senior Vice President, reporting directly to the President and CEO.

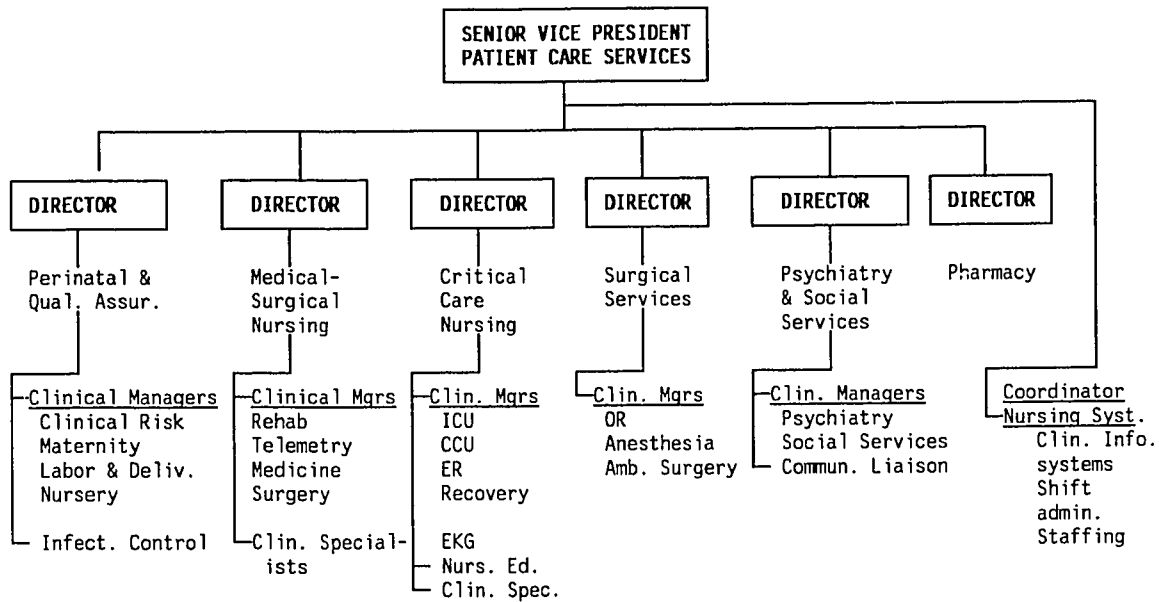
Administration within the division is decentralized to clinical subgroups, headed by subdivision directors, with first level nursing clinical managers report to their respective directors, or subdivision heads. The clinical managers are typically responsible for two or more clinical nursing units. Day to day responsibility for unit operations rests on the unit clinical managers and charge nurses (nurses who have both the patient care responsibilities of staff and shift-based administrative responsibility). Unit charge nurses participate in Clinical-Ladder based staff evaluations, as well as budget development and monitoring. In addition, charge nurses are responsible for shift to shift staffing decisions based upon patient acuity, occupancy and staff skill mix. All nurses and other employees of the Patient Care Services Division are members of Nursing Congress, which is the governing body for the division. Staff nurse participation in this governance encompasses advice, choice and execution of unit level activities directly affecting the nurse's clinical work, such as policies, procedures, budget development and monitoring. Patient Care Services nursing and nonnursing staff and administrator nurses work together through Nursing Congress committees to establish overall division policy. Nursing unit-based committees oversee implementation at the work unit level.

At the start of the study (1986), critical care was one of six subdivisions, the others being perinatal and obstetrical nursing, medical-surgical nursing, operating room, pharmacy, and psychiatry/social services. Four of the six directors were professional nurses. In 1989, these six divisions were consolidated to four: medical-surgical and critical care; perinatal and obstetrics; psychiatry/social services; and pharmacy. Two of the directors were nurses, the other two were a clinical social worker and a pharmacist. These changes are shown in Figure I.2, the Patient Care Services Division organizational chart.

SCH has two critical care units: a 12 bed mixed medical-surgical intensive care (ICU) and an 11 bed coronary care unit (CCU). Nursing staff are all Registered Nurses (RN); thus nursing care is not segmented into tasks accomplished by less well educated nurses' aides or Licensed Practical Nurses (LPN). Nurses are assigned to one or the other unit, but are trained to work in both as staffing needs require. The ICU and CCU are each administered by a different Clinical Manager who, in turn, reports to a single nurse director in the Patient Care Services Division. Unit shift-based charge nurses report to the clinical manager of each critical care unit.

The hospital and its critical care units were selected in regional competition in 1985 to house a project describing elements of cost and effectiveness of critical care nursing. Staff nurses, attending physicians and patients provided data for a wide range of clinical and organizational factors in 1986-87 and again in 1990. This database consisted of 1) responses to paper and pencil questionnaires administered to nurses and physicians in Fall 1986, Spring 1987 and Winter 1990,

1986-1989



1989 TO PRESENT

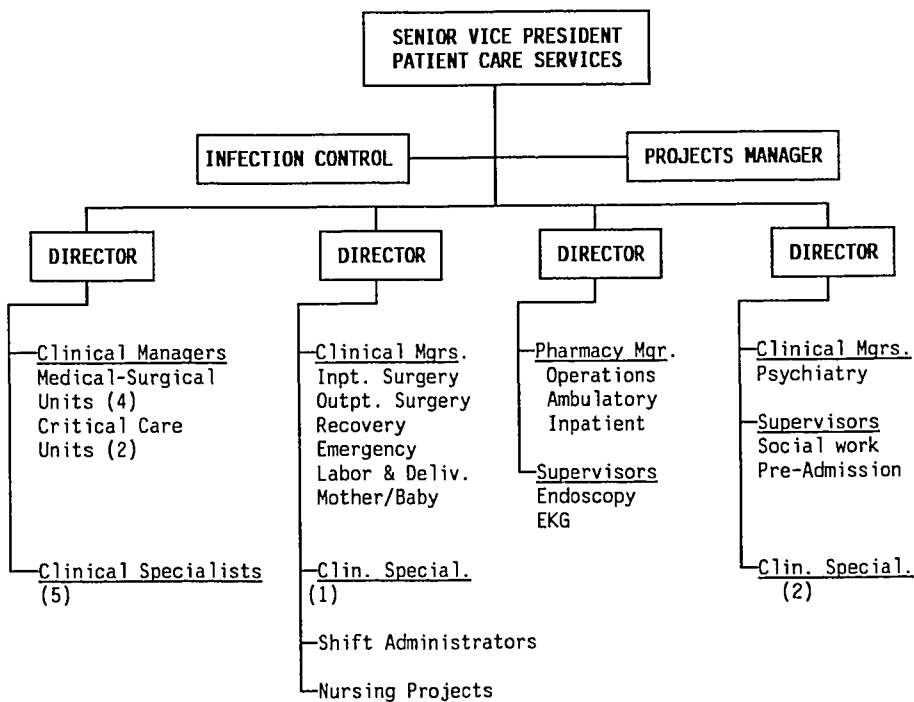


FIGURE I.2. INTERNAL REORGANIZATION OF PATIENT CARE SERVICES DIVISION

2) nonparticipant observations of patient care, and patient satisfaction surveys in Fall 1986, Spring 1987, and a hospital survey of patient satisfaction with critical care in 1990; 3) medical record data regarding severity of illness and patient mortality from Fall 1986, Spring 1987 and Winter-Spring 1990; 4) perceptions of organizational features of the units from open-ended interviews of staff nurses in summer 1989; 5) semi-structured interviews of key hospital and nursing administrators in 1990-91; 6) field notes recorded over the entire period 1986-1990; and 6) published demographic data related to the hospitals' sociopolitical-regulatory environment. The investigator had access to the data and the hospital over the entire four years as director of the aforementioned project. This relationship with the nursing staff and hospital administrators provided ready access for nonparticipant observations and the key informant interviews that supplemented the 1986-87 and 1990 questionnaire database.

Summary of Hospital Changes That Affected Critical Care

Both planned and unplanned changes (Knowles & Saxberg, 1988) in the physical facility of the critical care unit, in clinical services and technology, and in nursing administrative leadership occurred in the three and one-half years that elapsed between the first data collection and the last. These changes are shown schematically in Figure I.3 and summarized below.

Planned Changes occurred in the physical facility of the critical care unit and in clinical services and technology. A new Intensive Care Unit (ICU) was built and opened, and the number of fully monitored beds in the Coronary Care Unit (CCU) was expanded by four beds. Subsequently the number of patients increased in the critical care units, as did the number of nursing staff. In addition, the nursing and medical staff had to learn to use new equipment, such as more sophisticated bedside monitors, and intra-aortic balloon pump assist devices. Simultaneously, the units began to provide open-heart surgery, with the majority

<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
<u>PLANNED CHANGES</u>					
Planning for construction of new 12 bed ICU, operating suite Architectural drawings reviewed by RNS/MDS	-----construction ICU, operating suite, PAR----- June: move into new ICU				
			Ambulatory surgery opened	Positions added to ICU/CCU: hiring new Rns Formal orientation Critical Care nurse residency	
	Planning for cardiac surgery (pts to be housed in both ICU and CCU) CON approved, Spring		Sept.: cardiac surgery began		
			Updated CCU monitoring equipment; Expanded CCU beds: new Rns hired		
				Short stay unit in old ICU; ht. cath pts housed there	
			Planning for CNS case management of potential outliers Case management began Critical paths for selected DRGs		
		1st survey (Sept)		CON: add 50 beds to hospital June: MD Unit coordinators replaced with salaried direc. Jan.: 3d survey	
ICU/CCU selected as site for AACN Demonstration Project		2nd survey (April)	Reported back to Hospital, national publicity		
<u>UNPLANNED CHANGES</u>					
			June: CC Director left Sept: new CC Director started Sept: Sr. VP announced resignation October: Sr. VP left October: Acting VP appointed March: Acting VP appointed Sr. VP, Pt.Care April: CC Director resigned June:Consolidation directors		

FIGURE I.3 TIME SEQUENCE OF PLANNED AND UNPLANNED CHANGES AT SUBURBAN COMMUNITY HOSPITAL

of these patients housed in the CCU. Thus, the CCU nurses had to learn to care for a new type of patient at the same time they were learning to work with new nurses and surgeons. The renovated facility also included a short-stay monitoring unit, for patients such as those having coronary artery catheterization, in the space occupied by the old ICU. This unit relieved pressure on CCU monitoring beds, but also changed the nature of the CCU patient population, and thus the nature of the work for nurses.

Additional clinical service changes that had impact on critical care included the hospital wide development of designated care coordinators for patients identified as high risk for excessive lengths of stay; community case management to reduce frequent returns to the hospital; and the development of interdisciplinary, standardized written plans for moving patients in selected diagnostic groups more rapidly toward recovery. Finally, the hospital appointed salaried medical directors for each critical care unit. Their salaries came from the Patient Care Services budget. Previously, physicians and surgeons who frequently admitted patients to the units rotated responsibility for making rounds twice daily in the unit, working with the nursing staff regarding admission/discharge issues, and handling issues that arose over the quality of medical care. An additional medical director was elected on an annual basis to co-lead the ICU or CCU committee along with the respective nurse manager, but was not primarily responsible for the day to day coordination of medical administrative matters. The change to salaried medical directors placed all these functions under one physician in each unit.

Unplanned Changes included a fairly rapid succession of two critical care nursing directors and the chief nurse executive within a ten month period (June 1988-April 1989). The current chief nurse executive was appointed from within the organization approximately four months after her predecessor left, having been selected from a nationwide search. The critical care nursing director, who had five months earlier replaced the first director, resigned one month following the

appointment of the new chief nursing executive. Two months later (in May 1989), the division was reorganized to combine critical care and medical-surgical nursing units under one director, rather than the previous two (see Figure I.2). That position was filled by a current director from within the patient care services division.

All of these changes occurred within a regulatory and political environment that affected all the regions' hospitals: a continuing nursing shortage, increasing fiscal pressures from Medicare's prospective payment system, growing public concern about rising hospital costs, and a growing, but aging suburban population that put greater pressures on emergency and critical care services.

THE RESEARCH QUESTION

The complex environmental context and the specific changes in Suburban Community Hospital stimulated the primary question for this research:

What was the impact of multiple Patient Care Services division-level changes on selected indices of critical care unit clinical and nursing organizational performance?

CHAPTER II: UNDERSTANDING CRITICAL CARE FROM A HEALTH CARE SYSTEMS ECOLOGICAL PERSPECTIVE

This study focused on the impact of multiple changes in the Patient Care Services division of Suburban Community Hospital (SCH) on patient care and nursing organizational outcomes in critical care units. This chapter discusses the setting for the study in terms of a) the historical development of critical care and critical care nursing, and b) the specific critical care units at SCH. The concept of health care systems ecology is described to provide a framework for delineating key study concepts and variables. The literature regarding organizational change and organizational and clinical outcomes is reviewed in the context of the health care systems ecology concepts. Finally, the literatures is synthesized into a rationale for the study hypotheses and research methods.

Critical Care and Critical Care Nursing

During the Crimean War, Florence Nightingale moved the more salvageable wounded closer to the nurses' desk in her field hospital -- the earliest recorded instance of segregating severely ill patients for intensive nursing attention (Thompson, 1984). Modern critical care began with postanesthesia recovery rooms and then gained momentum during the decades of 1950 and 1960 when mechanical technology achieved its current preeminence in care of the ill -- with the mechanical ventilators ("Iron Lung") of the great poliomyelitis epidemics in the 1950's and later with continuous electrocardiographic monitoring and rapid cardiologic intervention in the coronary care units (Hilberman, 1975; Thompson, 1984; Stevens, 1989). Collectively we call these specialized nursing units intensive care, critical care, or special care units. Individually they are labeled by their generalized or specialized function (intensive care - ICU; coronary care - CCU, or neonatal intensive care - NICU, for example).

Nearly every hospital in the United States with more than 50 beds had an intensive care unit by 1965. The Hill-Burton grants for capital construction were a major factor in stimulating the construction of these specialized facilities (Stevens, 1989). Sixty four percent of critical care units are in hospitals of fewer than 300 beds, with 23 percent in hospitals with fewer than 100 beds. The majority of these hospitals have community, not-for-profit ownership. More than two-thirds of the units are mixed medical-surgical intensive care and coronary care units, with the remainder being specifically coronary care, medical or surgical intensive care, or one of several more specialized types of unit, such as trauma and neurosurgical intensive care. (American Hospital Association, 1990).

All types of critical care units have several things in common: relatively small size (typically 6-10 beds); high ratio of nurses to patients (2:1, 1:1, 1:2, rarely 1:3); concentration of high technology monitoring and intervention equipment. The minimum capabilities recommended by the Society of Critical Care Medicine (SCCM) include designated medical and nursing directors with education and experience in critical care, nurse staffing no lower than 1:3 ratio, continuous monitoring of several physiologic variables (electrocardiogram, arterial and central venous pressure, hemodynamics, cardiac output, transcutaneous oxygen, expired carbon dioxide, temperature); emergency equipment for airway maintenance, ventilation and cardiopulmonary resuscitation, transportable monitors, suction, hypo-hyperthermia blanket, and cardiac pacemaker. In addition, tertiary care centers and major teaching institutions are expected to provide access to computerized tomography, cardiac catheterization, nuclear medicine testing, bronchoscopy, fluoroscopy, and intracranial pressure monitoring (Task Force Guidelines, 1991).

Critical Care Nursing

Observers agree that tension exists around the exercise of professional judgment,

autonomy and clinical decision-making by nurses in hospitals. The sources of this tension include medicine's subordination of nursing early in nursing's development as a field, unequal status of nurses and physicians (related both to status of the professions and of men and women in society), and dual hierarchies of authority in hospitals. Nurses, like social workers, pharmacists, and respiratory therapists, are employees of the hospital, accountable to the Board of Trustees via the nursing service division and the overall hospital administration. In contrast, physicians are, for the most part, independent entrepreneurs who use hospitals for patients who need specific technologic services too expensive to provide in the office, or who need nursing care. The medical staff who use hospital services are organized in parallel rather than in hierarchical relationship to the hospital trustees or directors (Starr, 1982, Rosenberg, 1987; Reverby, 1989; Stevens, 1989). Although nurses and other employed professionals consider their practice to be professional, organizational scholars use the term "professional model" only to refer to parallel arrangements, such as those described for medicine (Mintzberg, 1983).

The modern critical care unit provides active surveillance and treatment of patients who are physiologically unstable or whose conditions may become unstable rapidly. These activities require a skilled and flexible nursing staff, who are constantly present and available to the patients. Patients and physicians rely on nurses' judgments in rapidly changing situations, particularly in small to medium sized community hospitals that have no medical staff in training.

Critical care became an arena that allowed expression of the professional autonomy, judgment, skill and training that was so often stifled in "general duty" nursing in the 1940s and 1950s. Physicians and nurses learned together a new set of technologic, diagnostic and treatment skills. Because of low nurse-patient ratios, nurses were able to practice the individualized care that seemed only a luxury in general medical-surgical units. Particularly in the early decades, many

nurses viewed critical care as "the elite of the hospital staff." (Strauss, 1968, p.9).

A more recent Canadian comparison of critical care units with other hospital nursing units showed that critical care units had the greatest degree of interaction with hospital support units and highest interaction with physicians. Surprisingly, critical care nurses did not perceive their autonomy to be significantly greater compared to nurses on any other type of nursing unit (Leatt & Schneck, 1982). The uncertainty (or complexity) of patient responses and instability of patients are consistently rated moderate to high in critical care units, compared to units such as rehabilitation and general medical-surgical, while variability is moderate. Variability of patient types is lower than in psychiatric units, for example, but higher than obstetrical units (Leatt & Schneck, 1981; Overton, Schneck & Hazlett, 1977; Campbell & Leatt, 1982; Armstrong, Krahenbuhl, Muellenback & Savage, 1984).

Interaction of Organizational and Clinical Factors in Critical Care

In 1983, the American Association of Critical-Care Nurses (AACN) and the Society of Critical Care Medicine (SCCM) formalized the ideal of interdisciplinary collaboration into a set of principles for joint medical and nursing management of critical care units. The principles stressed formal preparation and continuing education in critical care for both administrators and staff, joint responsibility and accountability for nurse and physician directors of the units, autonomy for physicians in dealing with medical practice issues, autonomy for nurses when dealing with nursing practice issues, mechanisms for joint problem-solving in overlapping practice issues, adequate hospital support services, and formal evaluation of the quality of care (Interorganizational Liaison Group..., 1983; Adler, 1984).

This joint formal statement emphasized the parity of organizational factors such

as joint medical and nursing administrative authority and hospital support services with individual clinical judgment in influencing the quality of critical care. Traditional wisdom holds that the clinical judgment of individual attending physicians and of nurses determine the life or death outcome of critical illness. That traditional wisdom is challenged by recent evidence that the organizational structure and the processes supporting delivery of care in the critical care unit are as important as the possession of individual clinical expertise. Specifically, factors such as communication and coordination among nurses and physicians distinguish units with differing mortality rates better than such factors as indirect measures of expertise (Knaus, Draper, Wagner & Zimmermann, 1986; Mitchell, Simpson, Armstrong & Lentz, 1989).

While we assume that the quality of patient care is related to organizational support for the processes involved in delivery of critical care, no one had tested this assumption prior to these two recent studies (Knaus et al, 1986; Mitchell et al, 1989). Investigators study various clinical and organizational aspects separately, but no model exists that might integrate them. The concepts of health care systems ecology provide one way to approach this problem.

THE STUDY MODEL

Health Care Systems Ecology

Ecology is defined as the science of the relationships between organisms and their environments. Health care systems can be considered an ecology if we interpret "organism" broadly, as levels of living systems ranging from cellular to social systems (Miller, 1978). The present study explicitly links three areas of knowledge that are usually viewed as separate environments: the sociopolitical and regulatory arena, the organization as environment, and the clinical environment of the patient. Each of these components is a system that forms the environment for

a system embedded within it: policy and regulatory arena as environment for health care organization; health care organization as environment for clinical care subunit; clinical care subunit as environment for patient care. The three areas: the sociopolitical-regulatory environment, the organization as environment (i.e. containing the clinical environment) and the clinical environments are described below. Figure II.1 depicts their relationships in terms of the problem for this study.

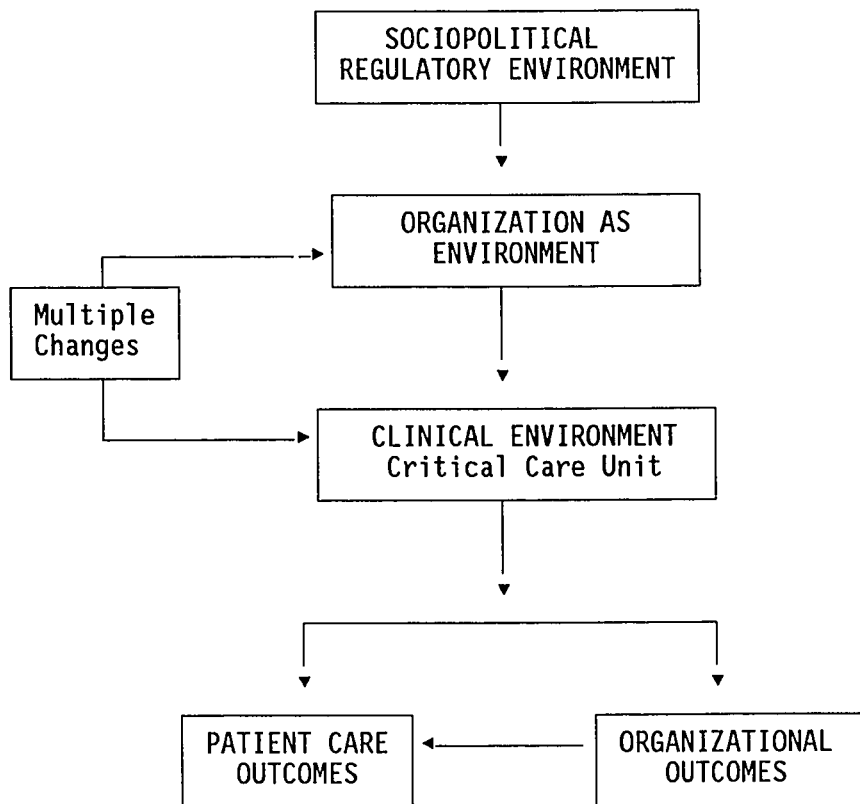


FIGURE II.1: Conceptual Model for Study of Impact of Multiple Hospital Changes on Patient and Organizational Outcomes

Moving from the top of Figure II.1 downward, we can see that the *sociopolitical regulatory environment* of the region and nation acts as the larger environment to the institutions in the region. Perturbations in the larger environment affect first the organization as a whole, and later the clinical care unit. The hospital organization in toto and the divisional organization comprise the *organizational environment* of the critical care unit itself. Changes in the organization act as turbulence in the intraorganizational environment and thereby influence the critical care unit (or the clinical environment) both directly and indirectly. The physical layout, instrumentation technology and the expertise of medical and nursing clinical personnel in the critical care units comprise the immediate *clinical environment* for patient care. The decisions and activities of the professional caregivers directly effect patient care outcomes, such as changes in patient health status, and patients' perceived satisfaction with nursing care. The interactions among professional caregivers in that clinical environment create a unit organizational culture that influences caregivers' values and beliefs about the nature of the work environment and the importance of their work. Both workers and leaders become important in both the construction and "deconstruction" of jointly held meaning about important events in their work life (Gray, Bougon & Donnellon, 1985).

Sociopolitical, Regulatory Environments

The social, political, economic and regulatory environments of organizations have played a prominent part in organizational science since the seminal work of Lawrence and Lorch (1967). They demonstrated that the nature of the larger environment determined the organization's structure in industrial organizations. The more complex and unstable the environment, the more differentiated and specialized the organization.

The organization was initially considered to be a closed system, with the wider societal and political environments as context, rather than as an interacting part of an open system. The relatively recent advent of organizational ecology has shifted the focus to the environment as a key factor in considering organizations as open systems (see for example Hannan & Freeman, 1977, 1990; McKelvey & Aldrich, 1983, Astley, 1985, Carroll, 1988). Organizational theorists have begun to consider the "birth and death" of organizations, and the change in their form and structure to be part of open, ecologic systems (Perrow, 1986; Scott, 1987). Hurley and Kaluzny (1987) describe three ecologic approaches: organizational demographics (life cycles of individual organizations in response to environmental pressures), population ecology (focusing on groups of organizations), and community ecology, or the structure of organizational communities. Economics is the primary metaphor for organizational environments, emphasizing resource dependency and market factors. The response of hospitals as organizations to political and regulatory environments is just beginning to be described (Cook, Shortell, Conrad & Morrissey, 1983; Shortell, Morrison & Friedman 1990).

This study differs from the organizational ecology tradition in that the subsystems of the organization are environments in their own right, interacting with the external environment. The nature of those interactions is examined, rather than the organization's interactions with others of its population. In organizational ecology, the entire organization is the unit of analysis, without reference to its subsystems (Burgelman, 1990).

Organization as Environment

While there is a large body of literature regarding the structure and processes of complex organizations, there is little that describes the health care organization as an environment of the unit-level clinical, or care-giving environment.

Organizational investigators describe hospitals or other health care institutions

from the perspectives used to study complex organizations: open systems, closed systems, rational, mechanistic, or organic (Scott, 1987; Astley & Van de Ven, 1983). Like the clinical environment, organizations are considered to have structures, processes, and outcomes. However, the outcomes described in most organization research come from manufacturing organizations and are only generally relevant to the particular mission of hospitals. For example, it is hard to visualize improved patient health in terms of industrial productivity. The manufacturing concept of industrial efficiency can be loosely translated into cost-effectiveness of given illness treatments. Certainly the human relations outcomes, such as worker morale and satisfaction are directly relevant to employed hospital staff.

Worker satisfaction, turnover and the like are the dominant focus of organizational studies in hospitals. Only a handful of studies explore the relationships of hospital organizational structures and processes to patient care outcomes as well as employee outcomes. (Georgopoulos & Mann, 1962; Georgopoulos, 1986; Flood & Scott, 1987; Mitchell, Simpson, Armstrong & Lentz, 1989).

Clinical Environments

The clinical environment is usually the background for clinician-patient encounters. We study patient care outcomes with the implicit assumption that there is a one-to-one correspondence between clinical processes and outcomes, without taking account of influence from the immediate care-giving environment. Laboratory scientists carefully control the physical environment when studying specific therapies. Clinical investigators assume that the care giving environment is equivalent or indifferent across settings, or simply ignore it. However, as Barnard and others have shown, the immediate care-giving environment in the intensive care unit can have a profound effect on preterm infant's and children's

physiological responses. We assume that these physiological responses influence response to clinical therapies (Blackburn & Barnard, 1985; Levin, Horowitz & Budd, 1985; High & Gorski, 1985; Mitchell et al, 1986). Similarly, the physical and interpersonal environment is an important mediator of therapy in psychiatric settings (Osmond, 1957, Stotland & Kobler, 1965, Canter & Canter, 1979, Whitehead, Polsky, Crookshank & Fik, 1984, for example). Even in laboratory settings, the varying of animal caretakers influences the degree to which rabbits develop atheromas on the same atherogenic diet (Nerem et al 1980).

This conceptual model suggests several points of linkage among these multiple environments that might be explored in empirical research. However, there is little literature examining relationships among elements of these environments and relevant patient care and organizational outcomes. Research has rarely linked clinical outcomes to organizational performance in health care.

Organizational performance has been studied with respect to structure and process in general hospitals (Burling, Lentz & Williams, 1956; Georgopoulos & Mann, 1962; Flood & Scott, 1987) critical care (Knaus et al, 1986, Mitchell et al, 1989) and emergency rooms (Georgopoulos, 1986). Only two research groups have examined patient care outcomes in relation to organizational structure or process features in critical care (Knaus et al, 1986; Mitchell et al, 1989). The Knaus group did not deliberately measure organizational factors. Rather they attempted to differentiate hospitals with high mortality from those with low mortality on the basis of such factors as full-time medical directors, teaching hospital status. Mitchell et al (1989) measured multiple unit organizational factors but studied only one hospital, so that a causal relationship between low mortality and various organizational factors cannot be claimed.

Further, existing studies have been framed from the system-structural perspective, which has been the dominant paradigm in organizational theory. However, the proposition that organizational cultural beliefs and values might directly or

indirectly influence patient care is best examined from a differing theoretical point of view -- namely organizational symbolism as a component of strategic choice.

Burrell and Morgan (1979) present a typology of sociological paradigms and related organizational theories, which places the two perspectives used to analyze these data in differing and often competing positions. The system-structural perspective stems from an objective, deterministic paradigm that they label functionalist, while the strategic choice perspectives come from an interpretive paradigm. They trace the intellectual history underlying the paradigms to show that fundamental assumptions differ about the nature of the phenomena, nature of knowledge about the phenomena and the way in which they are studied. For example, the functionalist paradigm is in the positivist tradition, with the goal of searching for regularities in order to predict and control. Theoretical concerns have to do with causal analysis and generalization, and methods requiring detached objectivity and reproducibility. In contrast, the interpretive paradigm comes from phenomenologic tradition: the goals to describe in order to understand; reality is socially constructed rather than caused by external forces, and one discovers knowledge through the perspectives of others.

The model used to select variables for this dissertation places implies that these perspectives provide differing, but not necessarily competing endpoints. Giddens' (1976, 1979) structuration theory provides a promising avenue to synthesize, rather than polarize these two perspectives. *Structuration* is a concept Giddens (1976, 1979) developed to describe the interactional processes that change structures. He derived the philosophical basis for structuring from hermeneutics - an interpretive process analyzing the deeper meaning of texts. However, Giddens' view of structuration accounts for the historical interpretations that create some bounds on current interpretations. He sees structuring as interactional, related to power and creation of norms; these interactions create structures that are related to domination and "rules". Riley (1983) offers some definitions to differentiate

structuring from structure as follows: "*structures* are the rules and resources people use in interaction...they are both the medium and the outcome of interaction....*Structuration*...is the production and reproduction of social systems through the application of rules and resources" (p.415) Individuals become important because "they are the carriers and creators of the rules and resources." Thus, neither structures or the structuring processes are static. Rather there are ongoing processes of human interaction that continually shape and shift the apparently stable structures. This view contrasts distinctly with the tenets of system-structural theories in which structures are relatively static, and exist independent of the people occupying structural positions.

Goia and Pitre (1990) see structuration as the middle ground between the positivist stance of structuralism and the interpretive stance of organizational enactment or constructed meaning. At time Giddens wrote, much sociological theory was positivistic; he was writing in defense of including interpretive work within the body of science. Little was done in terms of testing the theory until the 1980's when the concepts of organizational symbolism and enacted environments became popular. Only three empirical studies were found that used structuration to frame formal research (Manning, 1983; Riley, 1983; Barley, 1986). Only one prior study using the structuration framework is evident in health care settings. Barley (1986) examined the interactional processes among radiologists and technicians in two hospitals as they adapted to a new technology, computerized tomography. He found that the differing interactional patterns led to markedly different shifts in hierarchical structure in the two radiology departments, even though they had been identical prior to the introduction of the new technology.

Relationships Between Organizational Change and Organizational Performance in Health Care Organizations

Neither traditional system-structural research or that framed from strategic choice

perspectives have evaluated organizational *and* clinical performance with respect to organizational change. The focus of prior studies in organizational change has been employee satisfaction, rather than patient care outcomes (Bonjean, Brown, Grandjean & Macken, 1982; Hanlon & Gladstein, 1984).

Organizational Change

Organizational change is the subject of numerous prescriptive books and articles in the organizational development and organizational design literature (see for example Bennis, Benne & Chin, 1984; Legge, 1984; Spradley, 1980; Van de Ven, 1980; Sheldon, 1979). Further, there are a growing number of organizational ecology studies examining the birth and death of hospital or human service organizations in relation to extra-institutional change (see for example, Alexander & Amburgey, 1987; Singh, 1990). Surprisingly, only two data-based studies were located evaluating the impact of organizational change on performance in specific health care organizations (Bonjean, Brown, Grandjean & Macken, 1982; Hanlon & Gladstein, 1984).

Bonjean, Brown, Grandjean & Macken (1982) evaluated the effect of changes in organizational structure and faculty governance processes on faculty satisfaction in a school of nursing over six years. Change from a centralized, nonparticipative style of governance to a faculty-initiated decentralized mode of decision-making resulted in a large increase in reported faculty satisfaction with work and with the reorganization.

Hanlon & Gladstein (1984) evaluated the reasons that a quality of work life project in a large Eastern teaching hospital failed to make a difference in performance in clinical support departments such as laboratory, radiology, pathology services (Nadler, 1978; Nadler & Gladstein, 1982). Performance was defined primarily in terms of individual worker satisfaction, perceived autonomy

and perceived interdepartmental communication. Nursing units were not among the groups targeted for the action research design. Attitudes and satisfaction improved in a few areas in two of ten departments surveyed as a result of the project, but little overall impact was evident. The authors attributed the lack of effect to lack of union and management identification with the project, lack of physician support, and a poorly executed feedback process. There was no attempt to measure impact on clinical performance, or patient care outcomes.

Leader Change and Organizational Performance

Although leader succession is the most common change reported with respect to organizational performance, relatively few of these studies are in health care organizations. The earliest studies of changing leadership and organizational performance stemmed from the desire of organizational theorists to examine the leadership/performance question from the perspective of the whole organization. The empirical leadership literature did not provide strong support for the common sense view that individual executives and leaders make a great difference to an organization. Investigators reasoned that if individual leadership makes a noticeable impact on organizational productivity, this impact should be measurable by examining indices of productivity or performance relative to the tenure of individuals. Conversely, when a leader changes, a change in productivity should be evident. Studies examining performance relative to tenure are called "stewardship" studies while those examining performance in relation to change of leader are called "succession" studies (Romanelli & Tushman, 1988). The stewardship/succession studies in the general organizational literature are summarized in Tables A-E in Appendix 1.

The general organizational succession/stewardship studies have examined sports teams as proxies for complex organizations, artificial task groups in laboratories, social service, political, publishing and industrial organizations. The vast majority

have implicitly adopted the system-structural view. The findings have been mixed with regard to the relationship between either stewardship or succession and indices of industrial performance. The more mathematically sophisticated the design, the more complex the relationship, but in no case did the leadership variable account for a large percent of the variance in organizational performance. As a whole these studies support the notion that the context of leader change is as important as the traits, styles and origins of the individual leaders.

A few of the organizational change or changing leader studies have examined the succession problem from the perspective of enacted environments or shared meaning. Gephard (1978) explicitly described succession in a student organization in terms of construction of a shared organizational scheme against which successful replacement leaders are tested. Kotin & Sharaf (1967) and Stotland & Kobler (1965) implicitly, but not explicitly, suggest changes in shared values and beliefs in their case studies of changes in administration of mental hospitals.

Leader Change and Performance in Health Care Organizations

It is clear from Table II.1 that the literature summarizing the stewardship and succession studies specific to health care organizations is meager, with few health care-specific performance indicators. Stotland and Kobler's work, which has never been cited as a succession study, is the notable exception. Most investigators have studied administrator tenure (Kriesberg, 1962; Pfeffer & Salancik, 1977; Freund, 1985, 1987; Sredl, 1982). Only three report any kind of performance or interpersonal outcomes of administrative succession (Stotland & Kobler, 1965; Kotin & Sharaf, 1967; Brady & Helmich, 1983). Two of these three are case studies that explore impact of differing administrative styles on personnel (Kotin & Sharaf, 1967) and patient welfare (Stotland & Kobler, 1965). In addition, a few investigators have studied individual level leader-follower relationships

TABLE II.1: Leader Succession and Organizational Performance in Health Care Organizations

AUTHOR	DESIGN	KIND OF LEADER	MEASURE OF PERFORMANCE	RELATIONSHIP: CHANGE/PERFORM.
Kriesberg (1962)	Survey (N=226 depts) Descriptive	Heads of public health & mental health state & local depts	None:self-reported tenure of department head	Shorter tenure in depts <500 employees; slightly longer tenure in states with single party dominated legislature (implying political factor in tenure)
Stotland & Kobler (1965)	Case Study (N=1) interviews, archival data over 10 yr hospital life span	Medical Directors, administrators & nursing directors in private mental hospital	Staff morale, patient suicide	Declining morale ('loss of hope') epidemic of pt. suicides
Kotin & Sharaf (1967)	Case study (N=1) Interview, participant observation	Superintendent, state mental hospital	None, describes interpersonal responses to change from tight to loose administrative style	Criticism by "old guard" of new ways, some resignations; new autonomy & freedom for those who moved in new direction
Pfeffer & Salancik (1977)	Survey (N=57 hosp.) bivariate correl.	Chief hosp. adminis.	Tenure in current position	Hospital size positively related to inside succession & more formal training in hospital admin.; Context more strongly related to tenure than was size.
Sredl (1982)	Survey (N=66 admin. 2x2 correlation)	Directors of Nursing	None, examined personality characteristics of those reporting forced resignation	12.1% reported forced resignation; no significant relationship between personality traits & forced resignation
Brady & Helmich (1983)	Survey (N=97 admin. administrators)	Administrators of Catholic hospitals	Perceived org. improvement since own succession	Greater improvement perceived by outside

	Bivariate correl.	Directors of Nursing	Tenure	successors
Freund (1985)	Retrospective survey (random sample of Univ. hospitals, N=172 DON & CEO from 204 hospitals, descriptive			Average reported tenure over 10 years = 3.4 yrs; 40% reported involuntary resignation
Freund (1987)	Retrospective survey (N=118 CEOs from same sample as Freund 1985)	Chief Exec. Officer	Chief nursing officer (CNO) tenure relative to CEO CEO succession	Average CEO reported tenure over 10 yr. = 5.6 yr.; 12.2% of newly appointed CEO terminated current CNO 54.5% did not; 33.3% unknown

(Szilagyi, & Sims, 1974; Nealey, & Blood, 1968; Sims, & Szilagyi, 1975; Alpander, 1979). However, the paucity of performance measures and the isolation of the leader/follower dyad or small group from larger aspects of organization make these studies less useful for the present purpose. Only Stotland and Kobler (1965) have described both organizational and clinical impact of change in clinical leadership over time. They traced the history of a private mental hospital as it deteriorated from having been a growing showcase for psychoanalytically oriented therapy to become a struggling institution. A series of medical directors, hospital administrators and nursing directors were brought in from outside or appointed from within over a three year period. Trustees and staff looked at each new medical director as the savior of the struggling hospital. As each failed to reverse the financial problem, the staff became more and more demoralized. The final crisis was the suicide of six patients within a nine month period. Causal direction of each succession and worsening financial and clinical performance cannot be clear from this narrative account. However, the theory of "scapegoating" put forth by Gamson & Scotch (1964) in the baseball manager studies seems quite plausible in this case. With scapegoating, a deteriorating situation is blamed on the former leader and provides the impetus to get a new leader. Subsequent further deterioration is usually blamed on the new leader, when it is actually a function of the prior conditions.

IMPORTANCE OF THE STUDY

While there is a growing body of knowledge in the general organizational literature regarding organizational performance and both stewardship and leader succession, only a handful of studies exist with respect to health care organizations. Of these, only one addresses organizational and clinical performance issues. This paucity of health care organization-specific studies is relevant because health care institutions differ from manufacturing industrial and business corporations in important respects (Bedard & Johnson, 1984; Stoelwinder

& Clayton, 1978). They are more like public institutions than like manufacturing organizations in that their goals emphasize service, rather than profit (even in the profit-making sector). The increasing emphasis on cost-containment and market forces in health care is creating a conflict of goals for these organizations. However, productivity and performance are difficult to define and measure by the indices of market-oriented corporations. While improvement (or at least absence of decline) in patient health status is the implicit goal of health care institutions, the difficulties in measuring health and health status, and the multiple extra-institutional influences on individual health status and behavior compound the difficulties in determining organizational effectiveness. In addition, the historic separation of clinical and administrative spheres of control has mitigated against clinical outcomes being considered as impacted by administrative change.

This difficulty was overcome in this study by focusing on critical care units as one type of subunit in acute care hospitals. Since nursing administrators are responsible for both organizational administration and quality of clinical, or patient care, it is appropriate to consider both organizational and clinical outcomes as relevant measures of performance of the nursing unit.

We can clearly define and measure specific health status outcomes such as excess mortality (actual deaths greater than those predicted) in critical care (Knaus, et al, 1986). Both the organizational and clinical environments interact with individual or population factors known to directly and indirectly influence the risk of mortality. The organizational environment determines the organizational and clinical structures and processes involved in caring for critically ill persons; the clinical environment consists of the care-giving decisions and instrumentation technology available to direct caregivers to be used for the critically ill patient. And finally, the sociopolitical environment both within and outside the hospital influences the quantity and quality of care provided in a given setting, as well as the kind of leadership available to the organization.

In the face of change, the system-structural view suggests that key executives and managers are important organizational forces that protect the "technical core", or the level at which the work is done, from turbulence in the environment. The leader, from this view, functions to buffer the clinical nursing staff from factors outside their control (such as changes in method of hospital reimbursement). When the change directly affects the unit-level staff, the leader will work with these staff members to increase expertise in the face of new clinical or organizational technology (Thompson, 1967; Knowles & Saxberg, 1988). Satisfaction of individual nurses with their work as well as their declared intent to stay are variables known to mediate unit level turnover, which is indirectly related to the expertise necessary to provide the kind of clinical care that reduces mortality. Satisfaction of individual patients with their care is a subjective expression of patient perception of the organization's work, but is presumably not causally related to the measured health status outcome of mortality. Pfeffer (1981) argues that the theoretical perspective of organizational symbolism and construction of shared meaning has a different set of consequences than does the system-structural view. These consequences are sentiments, beliefs, attitudes and commitment. Although this set of consequences is often measured within the system-structural view, he argues that testable hypotheses regarding attitudes and the like are symbolic outcomes relevant to management control of symbolic meaning. Thus, the two theoretical perspectives, system-structural and strategic choice lead to differing, but complementary hypotheses and outcome variables.

THE RESEARCH HYPOTHESES

Since we presume that critical care patient outcomes such as mortality are mediated by such system-structural constructs as expertise and standardization of skill among professional personnel, comparison of indices of both clinical and organizational outcomes lends itself to statistically testable hypotheses.

Because the unit level nursing clinical managers remained stable, we assume they acted to buffer the staff nurses from changes in leadership and to facilitate incorporation of new technologies into the work. Therefore, we can predict that *clinical performance will not change*:

H1.0 There will be no difference in subunit-level standardized mortality ratio (as an index of excess mortality) in the critical care units when matched samples of patients are compared prior to and after the multiple divisional changes.

H2.0 There will be no difference in individual patient reported satisfaction with nursing care in the critical care units when matched samples of patients are compared prior to and after the multiple divisional changes.

This same stabilizing buffer function of the unit level clinical managers allows prediction that, *critical care unit organizational performance will not change*:

H3.0 There will be no difference in subunit-level staff nurse retention following the multiple divisional changes, compared to retention rates for the same period prior to the changes.

H3.1 There will be no difference in variables known to modify individual staff nurse retention (intent to stay and job satisfaction) following multiple divisional changes, compared to those variables prior to the changes.

H4.0 There will be no difference in subunit-level staff nurse and attending physician ratings of unit effectiveness following

multiple divisional changes, compared to ratings prior to the changes.

- H5.0 There will be no difference in resource consumption, as measured by unit and hospital length of stay for a matched sample of patients prior to and after the multiple changes.

However there were many new staff nurses coming into the clinical environment. These nurses were a potential source of different unit culture and shared meaning. Therefore we predict that:

If shared meaning among unit staff changes in the face of multiple organizational changes, unit level *organizational beliefs and perceptions will change*:

- H6.0 Indicators of critical care unit nurses' perception of organizational and work environment (esprit, intimacy, disengagement, involvement, peer cohesion and supervisory support) will change following multiple divisional changes, when compared to those measured prior to the changes.
- H7.0 Indicators of critical care unit nurses' beliefs about the organization as a place to work and the staff nurse role in patient care will change following multiple divisional changes, when compared to those beliefs measured prior to the changes.

THE STUDY METHOD

This study used a triangulated case study design to examine the impact of multiple

changes in the clinical and organizational environments of both patient and organizational outcomes. The investigator had the unique opportunity to study critical care units in a single institution over a five year period. Thus, data were available both before and after the multiple organizational changes described in Chapter I.

Triangulation and Case Study Design

Yin (1989) argues that the single case is an appropriate design when it represents a critical case, or "best" case for testing a significant theory, or competing theories. The richness of the existing database in this setting, and the commitment of the hospital to participate in remeasurement made it an ideal setting to test competing theories of organizational response to environmental change.

Within the single case design, the study uses multiple triangulation to approach the data from many directions (Denzin, 1970, p.301). Triangulation is a metaphor derived from the methods of navigators, surveyors and military tacticians to determine the location of an unknown point from the intersection of two or more known points. The method was derived from Campbell and Fiske's (1959) multimethod-multitrait matrix for reducing error in validating social science constructs. Multiple triangulation is the use of more than one type of triangulation within a single study. This study used both theoretical and methodological triangulation.

Theoretical triangulation involves the interpreting of the same set of data against more than one theoretical perspective. In this case the differing perspectives are the system-structural view that individual leadership and change are not crucial variables, versus the strategic choice view that the leader is important in creating positive work environments through organizational symbols.

Methodological triangulation has several subsets: *data triangulation* uses both the

individual and group level of analysis (Jick, 1979); *within-method* triangulation uses more than one measure of a given construct, and *between-method* triangulation uses distinct types of measurement for the same construct (Denzin, 1970; Mitchell, E., 1986). For example, aspects of organizational environment constructs such as perceptions of leadership and organizational effectiveness were measured with more than one quantitative survey instruments and with open-ended interviews (within-method and between- method), with items phrased eliciting perceptions of the group as well as individual behavior (data triangulation).

Key Concepts and Data Sources

The key concepts for the study are the three environments: the sociopolitical regulatory, organizational and clinical environments, and the outcomes: clinical (patient) outcomes and organizational outcomes. Table II.2 summarizes these concepts and data sources. A complete description of instruments is in Appendix 2.

The *sociopolitical regulatory environment* formed the context for the hospital over the study period. Compared to schema that describe the environment of manufacturing and heavy industrial organizations, there are relatively few with operational terms specific to health care organizations. Smith (1979) used a four factor schema to characterize the nursing home environment in terms of complexity, diversity, instability and uncertainty. More recently Shortell, Morrison and Friedman (1990) have reduced the construct of environments to two dimensions for acute care hospitals: munificence and hostility. *Munificence* is the degree to which the local and regional market are favorable for a hospital. The construct includes resources available to purchase health care services (for example the relative wealth of persons in the region, education and the like) and the resources available to provide care (for example, the number of physicians

and nurses per capita, inner-city versus suburban location). *Hostility* refers to the extent of external regulation and competition. This includes the number of hospitals competing for specific services (including critical care/trauma center

TABLE II.2 KEY STUDY CONCEPTS AND DATA SOURCES*

CONCEPT	DIMENSIONS	DATA SOURCES
Sociopolitical, Regulatory Environment	Munificence Hostility	Existing secondary sources, for example Washington State health data book, newspapers, health policy journals
Organization as Environment	Demographics Structure Performance	Hospital archives, org. charts, interviews, financial summaries, Washington State secondary sources
Clinical Environment	Clinical decision-making processes Physical environment	Interviews, self-rating scales, nonparticipant observation
Clinical Outcomes	Mortality ratio Patient Satisfaction	Medical records Survey, MD & RN estimates
Organizational Outcomes	Unit turnover/retention Nurse satisfaction Perceived effectiveness Resource consumption Beliefs about work/role	Hospital personnel records; surveys Surveys: RN & MD Unit, hospital length of stay surveys, interviews

* see Appendix 2 for complete description of instruments used to measure specific dimensions and variables.

designation), and number of health maintenance organizations (HMOs) in the market area. Regulation was measured by the existence and stringency of rate review and certificate-of-need processes in the state. Data sources included county and city demographic data from state and county sourcebooks, information regarding competition and regulation from hospital archival records, newspaper accounts and data publically available from the State of Washington and American Hospital Association.

Sources describing the sociopolitical-economic environment of the time period of the study included journals and texts in health policy, health services, and health care administration for the ten year period surrounding the change in leadership (1980-1990), newspaper accounts of national and regional factors affecting acute care hospitals, and interviews of key informants.

The *organization as environment* construct has many dimensions, the majority of which came from an existing database from the American Association of Critical-Care Nurses (AACN) Demonstration Project. Of particular interest are contextual and structural dimensions of the hospital. Contextual dimensions describe the entire organization (size, technology, for example) and structural dimensions relate to the internal characteristics (such as centralization of authority, formalization of processes, expertise of workers). Further, overall hospital performance had two dimensions: "doing well" (profitability) and "doing good" (fulfilling social functions) (Shortell et al, 1990). These data were available from public documents such as the Washington State Health Data Book (1986, 1990), newspaper reports, and the hospital's yearly financial summary (Cleverley, 1990).

The construct of the *care-giving environment* has dimensions of the clinical care-giving and decision-making processes, and characteristics of the physical environment. These were measured by formal paper and pencil surveys of

physician and nurse perceptions of collaboration and clinical effectiveness, nurse self-report of clinical skill, nurse demographics, and by observation and interview regarding clinical decision-making, and observation of the physical environment.

Two *clinical outcomes* were measurable: the ratio of actual deaths to the number predicted, adjusting for severity of illness (standardized mortality ratio), and patient satisfaction with nursing care. Medical records provided the physiologic data needed to calculate predicted mortality, as well as the actual number of in hospital deaths. Patient satisfaction with nursing care was estimated two ways: paper and pencil surveys of surviving patients, and nurse and physician estimates of patient satisfaction (see Appendix 2).

There were several dimensions to the concept of unit-level *organizational outcomes*. Data on turnover of registered nurses, and its reciprocal, retention were obtained from hospital personnel records for the fiscal year surrounding each data collection period (1986-87 and 1989-90). In addition, two survey instruments were used to estimate nurses' work satisfaction, which is a predictor of retention (see Appendix 2 for description of these survey instruments). Nurses and physicians rated their perceptions of unit effectiveness on the organizational diagnosis survey (Appendix 2). Finally, length of stay in both the critical care unit and the hospital served as an indirect measure of patient resource consumption. This information was obtained from unit admitting log books and from the discharge record.

Finally, nurses' beliefs about their work and role in patient care were obtained from selected items in the organizational diagnosis survey. Perceived organizational values and beliefs of both nurses and administrators were inferred from open-ended interviews. Interviews started with the questions: "tell me about some of the changes that have been occurring at SCH over the past 3 years; do you think those changes will affect patient care?, if so, how?" At the close,

informants were asked "what do you think is the most important value here?"

The interview data was examined with the following questions in mind:

1. Are there shared perceptions of key organizational values among staff nurses, physicians and hospital administrators? Have these changed over time?
2. How do staff nurses, physicians and administrators view the importance of the division level patient care services leaders in influencing patient care? Have the views of nurses, physicians or administrators changed over time?
3. Is there congruence of language used by clinical staff and administrative staff to describe effectiveness of unit function?
4. To what extent do nurses, physicians and administrators ascribe changes in patient care services to extra-institutional environmental pressures?

Methods of Data Collection

The data base of the AACN Demonstration Project (Mitchell, Forshee, Armstrong & Lentz, 1988) provided a computer databank of physician and nurse responses to an extensive questionnaire regarding such areas as perceptions of unit level work environment, satisfaction, and perceived competence; observations of patient care, patient status and mortality, observational field notes, and interviews of staff nurses regarding their clinical judgment processes. Those data were collected in the fall of 1986, spring of 1987 and spring-summer 1990. From April 1990 to February 1991, this investigator supplemented that database with interviews of key informants among the hospital administrators, patient care services current and former administrators, and key staff nurses and physicians.

The data base consisted of responses of staff nurses, attending physicians, patients, and administrators regarding a wide range of clinical and organizational factors in 1986-87 and again in 1990: 1) responses to paper and pencil questionnaires

administered to nurses and physicians in Fall 1986, Spring 1987 and Winter 1990; 2) nonparticipant observations of patient care and patient satisfaction surveys in Fall 1986, Spring 1987; 3) medical record data regarding severity of illness and patient mortality from Fall 1986, Spring 1987 and Winter-Spring 1990; 4) open-ended interviews of staff nurses in summer 1989; 5) semi-structured interviews of key hospital and nursing administrators in 1990-91, 6) field notes recorded over the entire period 1986-1990, and 6) published demographic data regarding the hospitals' sociopolitical-regulatory environment. The investigator had access to the data and the hospital over the entire four years as director of the aforementioned project. This relationship with the nursing staff and hospital administrators provided ready access for nonparticipant observations and the key informant interviews that supplemented the 1986-87 and 1990 questionnaire database. Descriptions of the instruments used and psychometric properties (where appropriate) are in Appendix 2.

The preliminary comparisons between the 1986-87 (pre-change) and the 1990 (post-change) data were reported to staff nurses in group meetings and individually to other informants. Their responses regarding the meaning and significance were also treated as data and incorporated into the interpretations in this dissertation. All direct contacts with human subjects for this research were approved through the AACN Demonstration Project for primary and secondary analysis by the University of Washington Human Subjects Review Board, and the hospital Institutional Review Board.

Methods of Analysis

The method of multiple triangulation requires several approaches to analysis. Traditional statistical methods were appropriate to compare quantitative data from the pre and post change periods. The 1986-87 surveys were both administered before the multiple changes and were designed to test the stability

of the instruments. This analysis used the second survey (spring 1987) for statistical comparison with the 1990 survey because some questions had inadvertently been omitted from the 1986 version. There was no statistically significant difference between mean scores for various scales on the 1986 survey as compared to the 1987, which was interpreted as showing instrument stability with repeated measurement.

Data from each time period was first arrayed graphically to test the assumptions underlying statistical hypothesis testing. For the most part, variables approximated a normal distribution. Data for length of stay was skewed and therefore was normalized by a natural log transformation. Student's t-tests for the differences in means tested the statistical significance of differences in data obtained before and after the change. Two-tailed tests were used because the direction of change was not specified in hypotheses. Approximately half the sample for the nurses' 1990 data had also responded to the 1987 survey, so the assumption of independence of samples was not strictly true. Rather than cut the sample in half and lose the newcomers' responses in order to use the paired t-test, the test for independent samples was used. In the 1990 survey, there were no significant differences in variables used for this dissertation between the responses of nurses who were new to the organization versus those who had responded to the 1987 survey. Further, there were no significant differences in responses to the 1987 survey between those nurses who did and did not also respond to the 1990 survey. Therefore, the overall group responses to the 1990 survey do not appear to have been influenced by the nonindependent observations.

In a few instances, several subscales of the same instrument were compared. The Bonferonni correction ($\alpha / \text{number of comparisons}$) was used to avoid the problem of multiple comparisons.

Content analysis was used to create coding categories for the data derived from

interviews, field notes and archival records. These data were used to address the research questions from the organizational symbolism perspective, and to add depth to the findings of the quantitative survey approach. Consistent with recommendations for increasing the reproducibility and credibility of inference and proof (Becker,1970; Campbell, 1975, Yin, 1985), the following safeguards against observer bias were observed: 1)complete record of observed events, 2) observation of a variety of events, 3) repeated observations of similarly events, 4) formulation and iterative testing of tentative hypotheses, 5) search for negative cases, and 6) use of multiple methods and "quasi-statistics" developed from coding and abstracting field notes, classifying into multiple analytic categories, positive and negative cases counted.

CHAPTER III

MULTIPLE CHANGES AND SELECTED PERFORMANCE OF A CRITICAL CARE UNIT

The American Association of Critical-Care Nurses (AACN) Demonstration Project described multiple aspects of organizational and clinical structure, process and outcome in 1986 and 1987 (Mitchell et al, 1988; 1989). AACN selected the two critical care units at Suburban Community Hospital (SCH) for study because they had many characteristics believed to be important in providing high quality patient care, such as an all Registered Nurse staff, decentralized administration, shared governance and high proportion of nurses certified in critical care. The findings reported from that project substantiated that these unit characteristics coexisted with indicators of desirable organizational and patient outcomes, and that the instruments used to measure organizational and clinical variables were stable over a six month time period. Selected organizational and clinical variables were to be remeasured in 1990, at the end of the funding for the project.

As described in Chapter I, numerous changes occurred in the Patient Care Services division and in the critical care units between 1987 and 1989: changes in 1) physical facility of the critical care units, 2) clinical and organizational technology, and 3) division leadership. The research that is the subject of this dissertation evaluated the effects of these changes by comparing scores on selected variables that were measured before (Spring 1987) and after (Winter-Spring 1990) the changes occurred. The changes were most intense from Fall 1987 through May 89. This investigator was project director of the AACN Demonstration Project, and as such directed the 1986-86 and 1990 survey data collection. She also reviewed field notes from the AACN Demonstration Project and conducted interviews with staff nurses, administrators, and physicians to gain insight into the way individuals in the hospital and the critical care units interpreted the meaning of the changes and outcomes.

SUBURBAN COMMUNITY HOSPITAL
IN THE CONTEXT OF ITS ENVIRONMENT

Suburban Community Hospital (SCH) is a private, not-for-profit, hospital serving a growing suburb of a major metropolis in the Far West. It was built in the late 1950's, largely through donations from community members to provide a general hospital in a growing suburb of the largest city in its state. SCH opened in 1960 with 56 beds (Eastside..., 1982). The state regulatory agency licensed SCH for 218 beds by 1982, and allowed expansion to 235 beds by 1990. The hospital claimed to have the busiest emergency room in its area by 1982, with qualifications for American College of Surgeons Level II Trauma Center designation (Wilson, 1983). This service led to an increasing emphasis on critical care inpatient services.

Environmental Munificence. SCH exists in a relatively munificent environment. It is supported by an affluent suburban community. The population of the surrounding city was nearly 74,000 in 1980 and had grown to nearly 87,000 by 1990, with a 77 percent increase in the number of jobs over the decade (State of Washington Data Book, 1989; Balter, 1991). The city is part of the most rapidly growing suburbs of a metropolitan area of over 1 million (Fevell, 1986, Balter, 1991). Although the popular stereotype of the suburb is that of a young, white, upper middle-class enclave, the proportion of elderly, minority and lower income people has grown over the past decade. The 1990 census showed that 10.4 percent of the city residents were over 65, compared with 6.1 percent in 1980. In addition there was a 700 percent increase from 1980 in the minority population of the general suburban area, with increasing economic diversity (Pryne, 1991; Balter & Gilmore, 1991). County per capita income is \$19,511, with manufacturing, service and government as the largest employers. (State of Washington Data Book, 1989). The county has the states' highest number of physicians and second highest number of registered nurses per 1000 population, and the lowest number

of licensed practical nurses per 1000 (Washington State 1986 Health Data Book: County...). These data suggest a ready supply of highly trained health care providers.

Environmental Hostility. Health care regulation is strong in the state in which SCH exists. Hospital rates were regulated by the State government until 1989, and are still watched closely by state regulators. Certificate of Need is required for licensing new hospital beds and adding major equipment or services (such as open-heart surgery, hospice and the like).

SCH's main competitors are a 134 bed hospital nearby in the same second tier suburban ring and three larger urban hospitals in the adjacent metropolis. A nearby branch of a large HMO is located nearby, but is not considered by SCH to be a competitor because subscribers to the HMO use only that hospital. SCH was reported to have 35 percent of the local hospital market and the fourth highest market share of the county's 30 hospitals in 1986 (Washington State Health Data Book: Hospital Profiles, 1986). Hospital administrators for SCH and its nearest competitor contend that share is artificially depressed by state regulatory limitations on bed size. Over the years these administrators have cited the rapidly growing and aging suburban population to justify a large increase in combined beds. Both hospitals were successful in gaining some increase in 1982 and again in 1989 (Moe, 1982 May 4; Moe 1982 May 18; Varosh, 1989).

Hospital Performance. The hospital's financial state was a subject of public comment in the early 1980's, when a new Chief Executive Officer (CEO) was brought from out of state to "move in a new direction...from a small community hospital to a full service medical center" (Moe, 1983, February 13). SCH has maintained profitability throughout the years surrounding the study even in the fact of prospective payment for Medicare and growing levels of hospital unpaid bills throughout the state (Ailing people...1983; Neurath, 1983). Operating margin

has remained in the upper quartile of all U.S. and Far West hospitals of the same and large size. Another measure of profitability, return on total assets, has hovered around the U.S. and Far West hospital median from 1985-1989 (Cleverley, 1990). However, since the completion of this study, SCH has announced rate increases of greater than 20 percent, followed by announcement of substantial cutbacks in staff (Montgomery, 1991; Gorlick, 1991). Some observers suggest that this less favorable financial performance is a result of loss of some managed care plan contracts, which may have decreased occupancy, combined with decreased Medicare reimbursement and a substantial debt incurred in recent building projects. Ironically, increased efficiency as indicated by short hospital lengths of stay at SCH contributed to the shortfall in revenue (Montgomery, 1991).

Shortell et al, (1990) also describe "doing good" as a component of hospital performance. SCH offers a number of services as a public service, such as free or low cost health education and health promotion programs, in-home visits by nurse community case manager, and a community health resource center. Both SCH and its nearest competitor rank at the bottom of area hospitals for percent of budget spent for charity care and bad debt (Hubbard, 1985). These measures are a rough index of both demand for and response to the needs of the less affluent in an affluent suburb.

In summary, SCH operates in a generally favorable socioeconomic environment, but competing for its perceived share of the hospital market in a strongly regulated state. It remains to be seen if the recent reversal of strong economic performance will alter the strong organizational support for innovative and high quality clinical services.

The Critical Care Units at SCH

SCH has two critical care units: a 12 bed mixed medical-surgical intensive care

(ICU) and an 11 bed coronary care unit (CCU). Nursing staff are assigned to one or the other unit, but are trained to work in both as staffing needs require. The ICU and CCU are each administered by a different Clinical Manager who, in turn, reports to a single nurse director in the Patient Care Services Division. Unit shift-based charge nurses report to the clinical manager of each critical care unit. The organizational structure of the Patient Care Services Division was shown in Figure I.2. Patient Care Services Division is one of five divisions in the hospital structure, as previously shown in Figure I.1. The other divisions are professional services (such as medical records, imaging), finances, support services (such as central supply and purchasing), and human resources (personnel, education).

The Patient Care Services division is responsible for nursing services in all hospital units and the operating room, as well as for pharmacy, social work and psychiatry services. Almost all direct patient contact is administered in this division, except for such services as occupational and physical therapy and diagnostic radiology. The chief nursing officer administers this division as a Senior Vice President, reporting directly to the President and CEO. Administration within the division is decentralized to clinical subgroups, headed by subdivision directors. The first level clinical unit managers report to their respective division heads. At the start of the study, critical care was one of six subdivisions, the others being perinatal and obstetrical nursing, medical-surgical nursing, operating room, pharmacy, and psychiatry/social services. In 1990, these six divisions were consolidated to four: medical-surgical and critical care; perinatal and obstetrics; psychiatry/social services; and pharmacy.

In 1986-87 the two critical care units were contiguous, separated by a short hallway. Staff frequently "floated" or moved to the other unit due to staffing needs. The new ICU, opened in the summer of 1988, is in a new wing of the building, several hundred feet away from the CCU. Staff are more self-contained within each unit than was the case in 1986-87. There is still some "floating"

between units, but not to the extent formerly seen. Nurses continue to be trained and oriented to function in both units, however.

The Nurses and Physicians in SCH Critical Care Units

Forty two and 45 nurses and 23 and 29 physicians provided data in 1986-87 and 1990, respectively about their perceptions of the critical care units, quality of patient care and level of professional expertise. Nurses completed the more extensive paper and pencil surveys about their practice and the unit organizational factors. In addition, 21 nurses shared stories of memorable patient care experiences in open-ended interviews. Twelve current and former administrators also participated in interviews regarding their perceptions of the changes influencing critical care, history and values of the organization.

The overall questionnaire return rate for nurses dropped as shown below.

	1987	1990
	Percent (Number)	Percent (Number)
Registered Nurses	93% (43/46)	62% (45/73)
Physicians	68% (21/34)	73% (29/40)

Fifty one percent of nurses new to unit returned the survey (20 returned of 30 distributed). Many of these new nurses said they did not feel they had been there long enough to comment. Seventy four percent of those who had also been employed in 1986-87 participated in the 1990 survey (25 returned of 34 distributed). Seventy-three percent of the physician questionnaires distributed for 1990 were returned (29 returned of 40 distributed).

The following description of the nurses and physicians reflect data from the demographic portions of the questionnaires as well as general characteristics

available from hospital records regarding all staff. Summary demographic data tables are found in Appendix 3.

The Nurses

The nursing staff in SCH's ICU and CCU are all registered nurses with considerable experience in nursing and specifically in critical care. The mean age has increased slightly, from 38.6 to 41.6 years. Figure III.1 shows indicators of nursing expertise, in terms of years of nursing experience and certification in the specialty of critical care nursing (CCRN certification). Certification in critical care nursing (CCRN) indicates knowledge and experience beyond the basic specialty practice. The percent of Rns certified in critical care has increased from 39 percent in 1986-87 to 45 percent in 1990. Figure III.1 indicates that the 1990 rate of CCRN certification at SCH was nearly three times that of a national sample of critical care nurses (Levine, 1988).

The mean years in nursing has increased from 14.5 to 17.6 years, with a median of 12 years. For most of the nurses, over half of these years were in critical care. The median time in nursing is nearly twice the median years of experience for a national sample of critical care nurses, indicated in Figure III.1 by the left to right diagonal hatched bars (Levine 1988).

Appendix 3 summarizes educational and part time/ fulltime employment. A larger percent of the unit nurses had their highest educational credential from diploma programs than is the case nationally (36 percent versus 27 percent nationally), but there were also more with master's degrees than is the case nationally (9 percent versus 2 percent). SCH critical care nurses are more likely to work part time than is the case nationally, with the percent of part time employees increasing from 67 percent in 1986-87 to nearly 80 percent in 1990. Nurses at SCH work part-time by personal choice, and the hospital has made a

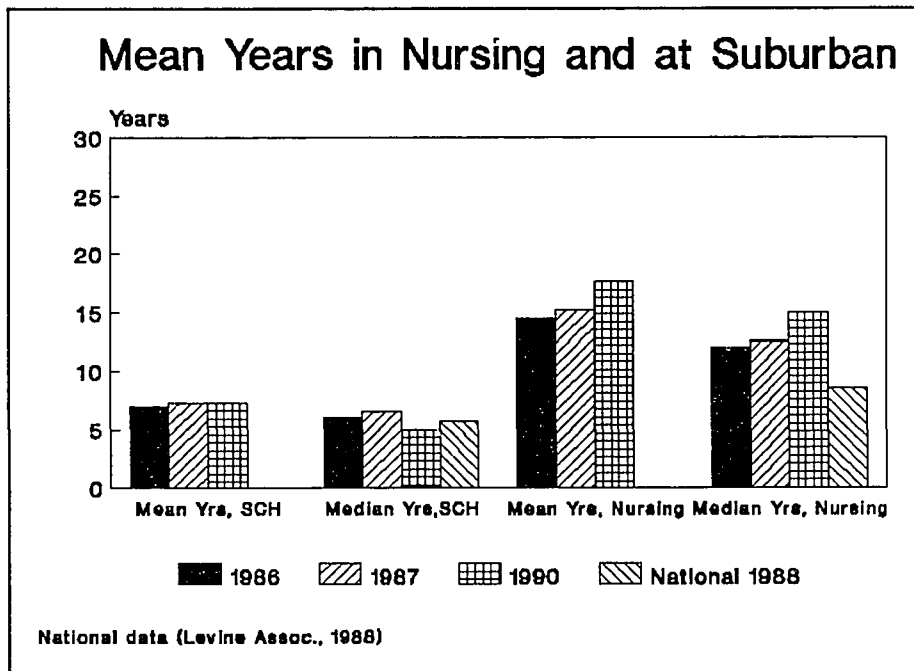
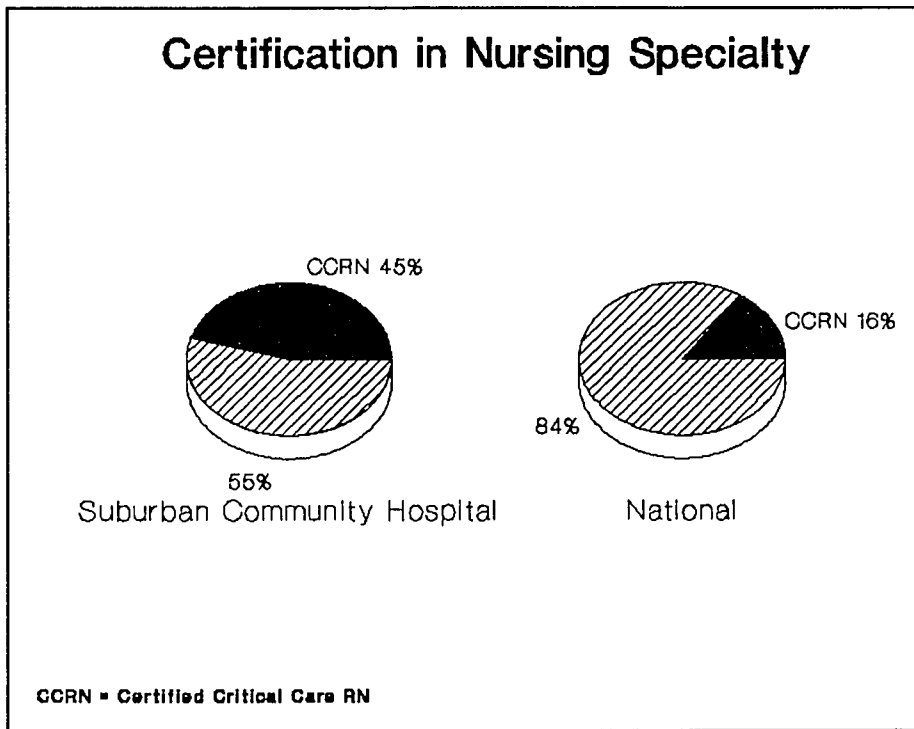


Figure III.1 Indices of Nursing Expertise at SCH: Certification and Experience

deliberate effort to support that choice. This pattern is common in suburban hospitals in the metropolitan region, but is uncommon nationally. A national sample of critical care nurses had over 80 percent working full time(Levine, 1988).

The Physicians

The physician questionnaires did not include demographic data. Therefore the primary descriptors of the physicians come from the hospital medical staff roster for those physicians who were primary attending or consulting physician for the patients included in the study at each period. While all physicians on the SCH medical staff are technically eligible to admit patients to the critical care units, a relatively small number actually do with any regularity. For each time period, fewer than 50 of the over 300 member medical staff were primary physicians for the patients in the study. Over 90 percent were certified in one or more medical specialties. Only three were certified specifically in critical care -- a relatively new medical board specialty. The difference in percent of nurses and physicians certified in general reflects the fact that nursing offers few incentives for certification, whereas it has become an implicit necessity for establishing admitting privileges for physicians in many hospitals.

The specialties represented among physicians caring for the study patients include internal medicine, pulmonology, critical care, general surgery, thoracic surgery, cardiology, family practice and various medical and surgical subspecialties. Only five attending physicians of patients in the 1990 did not also care for patients in 1986-1987. They were primarily cardiac surgeons and pulmonologists who had joined the hospital staff since the earlier survey.

The Patients in SCH Critical Care Units

The patient sample for 1990 was matched by age range and diagnostic category to

those patients in the 1986-87 sample, in order to avoid biasing the weightings used in the APACHE II algorithm for predicting mortality in the group of patients (see Appendix 2 for discussion of this algorithm). Figure III.2 shows the two patient groups categorized by primary organ system failure that led to critical care admission. Over half the patients at both time periods had cardiovascular system disorders, followed by respiratory, gastrointestinal, neurological, renal, metabolic and hematologic disorders. The slight differences seen do not alter the disease category weightings between the two time periods. A complete summary of patient demographic data is in Appendix 3. The most common medical diagnoses for patients in both units were various forms of heart disease or other vascular disease: coronary artery disease, myocardial infarction and congestive heart failure, peripheral vascular disease. The next most common causes of critical care unit hospitalization were visceral obstruction or perforation and bleeding. Other diagnostic categories seen in the patients in the sample included neoplasm, infection, rhythm disturbances, drug overdose, trauma and accidental poisoning. Patients in both groups were elderly (mean age 63 years, median age 68 and 66 years respectively), predominantly caucasian and evenly divided between male and female.

Severity of illness was measured by the Acute Physiology and Chronic Health Evaluation (APACHE II) score. The APACHE II score is a weighted score reflecting degree of departure from normal physiologic function, age and history of chronic illness. A higher score indicates greater physiologic instability, and, depending on the disease process, greater probability of dying. Patients were more severely ill on the average in 1990 than in 1986-87, with the mean APACHE II score of 13.7 (s.d. 7.6) in 1990, compared with a mean score of 12.9 (s.d. 6.54) in 1986-87.

Primary Organ System Failure

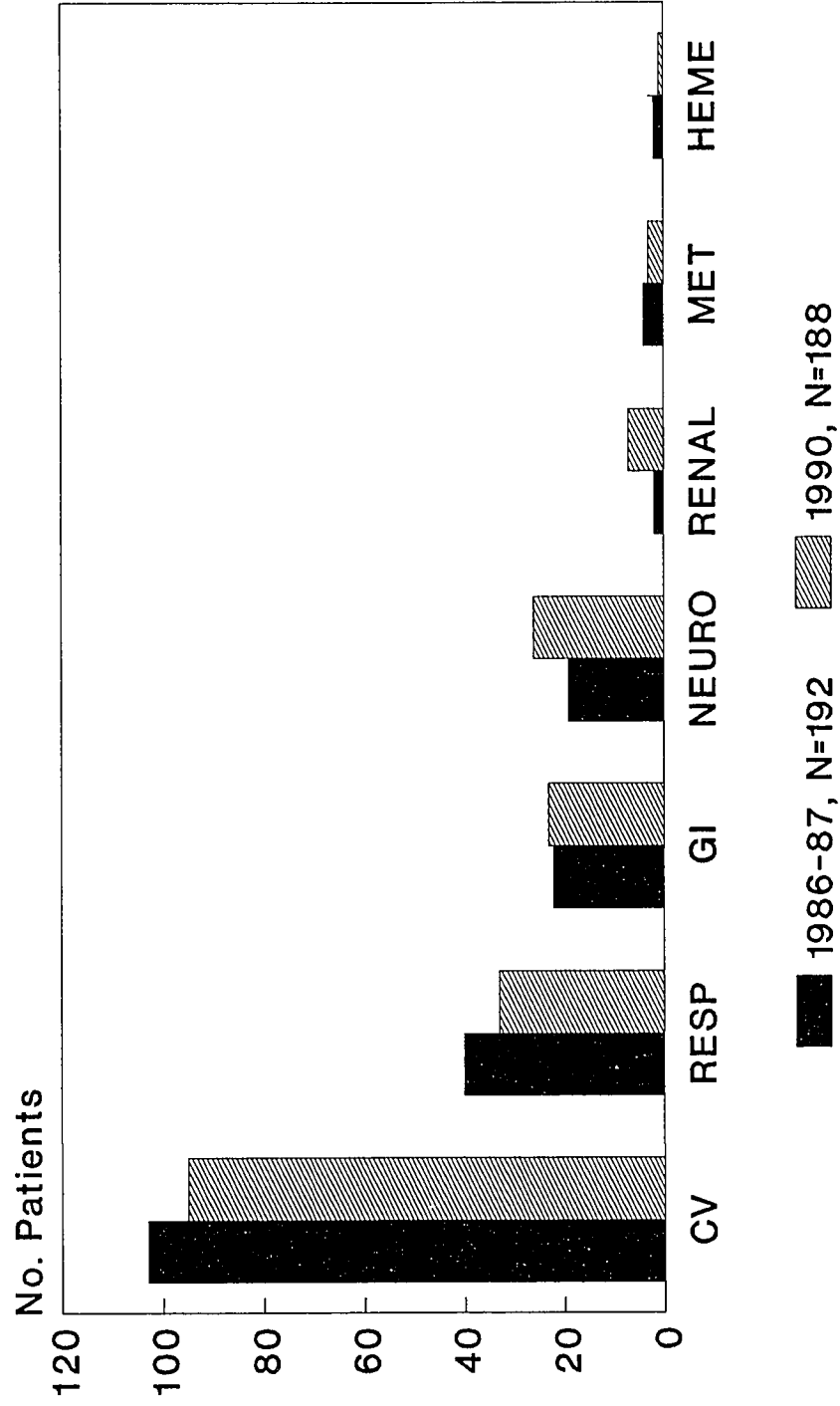


Figure III.2 Primary Organ System Failure Precipitating Admission to Critical Care

FINDINGS RELATED TO THE STUDY HYPOTHESES

The system structural perspective led to predictions that indicators of *clinical and unit-level organizational performance would not change* because unit level clinical managers remained stable and provided buffering (hypotheses 1-5). The strategic choice, enacted meaning perspective led to hypotheses that if shared meaning changed in the face of multiple organizational changes, nurses' *organizational beliefs and perceptions would change* (hypotheses 6 and 7).

System-Structural Hypotheses

Administrative decision-making at SCH is decentralized to the first level unit clinical nursing managers, who have full responsibility and authority for budgeting, personnel decisions, training and development of the nursing staff. These managers, along with designated charge nurses act jointly with the unit physician directors to decide such nonroutine admission and discharge matters as closing the unit due to inadequate beds or staffing. The nursing clinical manager and the physician medical director for each unit are co-chairs of the respective ICU or CCU committee for the hospital. These committees act to determine overall unit policies that involve both medicine and nursing and to review quality assurance matters involving both professions.

The ICU and the CCU clinical managers had been in their positions over five years and did not change positions during the many administrator changes in the Patient Care Services Division. The 1989 consolidation of director positions affected both clinical managers in that the CCU manager assumed responsibility for another clinical unit (operating room) as an acting manager, and the ICU manager began to report to two directors because she also managed recovery room. These changes are shown in Figure I.2.

These two managers, other administrators and staff nurses agreed that the many changes occurring between 1987 and 1990 put a strain on the unit managers. Shift-based charge nurses for the ICU and for the CCU assumed a more managerial role than had previously been the case, as the first line managers delegated more to them. All informants agreed, however, that the ICU and CCU managers had been true stabilizing forces during that time. After hearing the preliminary findings from the 1990 study, one director commented about one of the managers "she's the reason everyone stayed sane."

Clinical Performance: Patient Care Outcomes

Two specific patient outcomes formed the measure of clinical performance: excess mortality and patient satisfaction with nursing care. The hypotheses regarding patient care outcomes were as follows:

- H1.0 There will be no difference in subunit-level *standardized mortality ratio* (as an index of excess mortality) in the critical care units when matched samples of patients are compared prior to and after the multiple divisional changes.
- H2.0 There will be no difference in individual reported *patient satisfaction with nursing care* in the critical care units when matched samples of patients are compared prior to and after the multiple divisional changes.

Mortality Outcomes

Standardized mortality ratio (SMR) is the proportion of actual in-hospital deaths to the number of deaths predicted times 100. The APACHE II algorithm used to estimate overall predicted mortality was devised by the George Washington University ICU research group. It provides a prediction of the probability of dying for each patient, adjusting for physiologic instability, age, diagnostic category and history of severe chronic illness. These probabilities are then averaged to

determine an overall predicted mortality for a group of patients. The weights for diagnostic category or primary failing system were derived from a database of over 5000 patients, with an 85 percent correct classification, given a 50 percent probability of dying. This system is widely used for estimating mortality in a group of critically ill persons (Knaus, Draper, Wagner & Zimmerman, 1985; Wagner, Knaus & Draper, 1983). It is similar to the system used by the Health Care Financing Administration (HCFA) to compare hospital mortality rates for Medicare patients. The SMR for patients sampled prior to and after the divisional changes are compared in Figure III.3, with the data displayed in Table III.1.

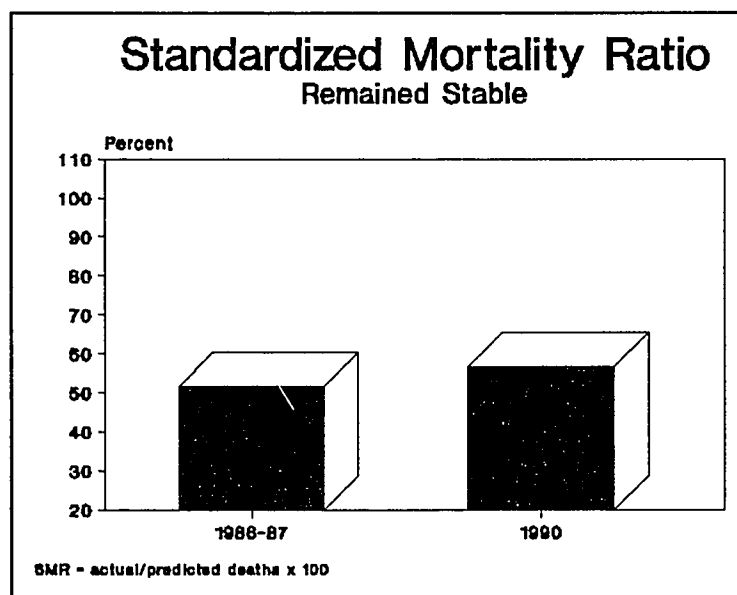


Figure III.3 Standardized Mortality Ratio Did Not Change Significantly

It is evident from Figure III.3 that the SMR changed very little from 1986-87 to 1990 and that it remained well below 100 percent. Ninety-five percent confidence intervals (95% CI) were calculated for each SMR estimate to determine the significance of the difference in SMR at the two time periods. The SMR and numbers of actual and predicted deaths for Time 1, prior to the divisional changes and for Time 2, following the changes are shown in Table III.1.

TABLE III.1. Standardized Mortality Ratios at Two Time Periods

	TIME 1 (1986-87)	TIME 2 (1990)
SMR	51.5%*	56.7%*
95% CI	45.9%, 60.7%	48.8%, 65.6%
	Deaths:	
Predicted	33	37
Actual	17	21

SMR = Standardized Mortality Ratio; CI = confidence interval. * NS, .05 level

Since the 95 percent confidence interval boundaries overlap for the two time periods, the probability that the two samples are from the same population is greater than 95 percent. Thus, the mortality ratios are not significantly different from each other. Further, since neither the upper nor lower bound of either 95 percent confidence interval includes 100 percent the probability is less than 5 percent that these samples are from a population in which the actual and predicted mortality are equal. Therefore, the standardized mortality ratio is significantly less than 100 percent for both time periods ($p < .05$).

The hypothesis is therefore supported and can be interpreted as meaning that over a sustained period of time, fewer patients are dying than would be predicted, given the seriousness of their disease, their age and chronic state of health.

Although this outcome tells us nothing about the quality of the saved life, it is exactly what critical care is designed to do: save lives that might otherwise have been lost. Nurses and physicians reflected on this aspect of quality of care in both formal interviews and in the casual conversations recorded in field notes. Both nursing and medical staff identified medical and nursing expertise, interdisciplinary collaboration and institutional support as key factors in low mortality. As one of the medical directors put it:

"I think we have good physicians here; ...it's a young staff, more aggressive. And I think the nurses are right on top of things. I think there are good staffing ratios; that gives them [nurses] more time to look at problems...they're familiar with the patients and the problems; they're able to point out things -- and that all points toward good care. I think we just have a good working relationship."

Medical and Nursing Expertise is a key element of structure in a professional organization. Structural mechanisms that supported the development and maintenance of expertise included continuing education for nurses and physicians, as well as formal and informal teaching and consultation revolving around specific patients on the units. The clinical outcomes of expertise are exemplified in an incident recorded in a field note from the old ICU:

The patient was a young man who had nearly drowned and also had a head injury. His breathing was maintained by a respirator and, although he was conscious, he was heavily sedated and had a muscle paralyzing agent to prevent his "fighting" the ventilator. His arms began to twitch ever so slightly and his nurse recognized that he was having seizures, the manifestations masked by the muscle paralytic drug. She quietly asked that someone get an intravenous anticonvulsant (which she later described as part of a protocol for seizures) and two other nurses appeared to help without further summons. The respiratory therapist appeared and drew blood to check arterial blood gases, also without specific request. Another nurse called the patients' physician and radiology to get orders for a CT scan. There was remarkably smooth teamwork in getting appropriate orders, getting the patient to radiology out of the scheduled sequence, keeping the patient ventilated while moving his bed, traction, and portable monitoring equipment into elevators and to radiology. Throughout, the nurse was attentive to the patient's probable awareness, talked *to* [not over] him, and reoriented him to each change of environment.

However, routine systems used to maintain expertise were taxed by the rapidly sequential start of open-heart surgery, opening of the new ICU and hiring of large numbers of nurses new to the hospital and the units. Further, new surgeons came onto the medical staff to provide the specific expertise in cardiac (as opposed to

general thoracic) surgery. A nursing manager described the impact:

"...we had to add people pretty fast. So that it really taxed the staff, in terms of their ability to assimilate them into the group. There were greater demands on the people that had been here, because they were the experts and were really called upon to be that every day. Whereas...before they were all kind of equal and equally expert and could count on each other equally. And that really changed, probably for about two years. It was impossible for them [the core experts] to supervise the care of all those people [new nurses]. And a lot of the people who were taking care of the patients either weren't experts because they were new, or didn't come from exactly the same setting [or were from temporary agencies]...But now things have really stabilized."

Managers, staff nurses and clinical nurse specialists formalized what had previously been informal skill development and training mechanisms to create and maintain expertise in the face of new demands in the clinical environment. In the past, the clinical nurse specialist had functioned as clinical unit teacher to help the staff learn to use new equipment or procedures, for example the balloon pump device to assist failing hearts, and the care of open-heart surgery patients. Similar approaches were used to 1) begin a formal orientation for new nurses, 2) identify preceptor nurses on each shift to orient new nurses, and 3) begin a residency program to teach critical care skills to nurses experienced in other areas before they were hired for the unit. Further, the shift-based charge nurses began to function in a more managerial role. Previously, a shift charge nurse was a senior nurse who "took the desk" (i.e. communicated with the staffing office, admitting office and attended to new orders) as well as her own patient care assignments. With the expansion of units and staff, the charge nurse role changed to that of a first-line manager, with responsibility for performance evaluation, clinical resource to staff, assessing needs of staff for continuing education and development. The patient care services division provided monthly educational meetings to these charge nurses to meet their needs for development of expertise in management. One new nurse attested to the functional and personal value of these strategies:

"In comparison [to her previous hospital], Suburban is so much

kinder. The hospital I came from was just sort of sink or swim. And I didn't feel a lot of support...And here they give you such a long internship period; ... you're not thrown in [because of the staffing]. The charge nurses are available, and you have your own preceptor...I was amazed at how quickly I felt like I fit in here. It was almost immediate that I got to know people and be invited to do things. You felt like you were part of the family right away."

Informally, the staff nurses themselves were the key players in "getting people up to speed", as one informant put it. For example, some new staff came assuming they should not question physician's orders or disagree with physicians. Field notes contain many examples in which experienced staff not only told them that such questioning was acceptable here, but coached them about how to do it constructively. Taking on these new behaviors was not easy for new nurses:

"...when I started working here it was really hard to adjust. This is the first hospital where I worked where nurses have lots of autonomy. And now I feel happy and I feel satisfied as a professional since I have more decision making to do in regards to management of the patient."

Staff were clear about what the informal standards were for "nursing the way we do it here": really caring about the patient, working hard, not just putting your hours in, behaving like a professional. One manager said "they [staff nurses] will work forever with someone who lacks experience or skill. But someone comes in who doesn't have that [willingness to try], then they don't fit in well." While the staff was perceived by the managers to be supportive of new people who tried hard, lack of professionalism or desire to grow "was just not tolerated...their peers couldn't understand why they didn't care."

Cardiac surgeons and other new physicians were also entering the medical staff and the assimilation appears to have occurred primarily through informal processes. There was an expectation that nurses and physicians will trust one another's decisions, and that they will treat each other with respect. A perceived lack of expertise can leave staff fumbling for ways to handle the situation, as one

nurse described:

"Well, in fact not knowing the bedside physician was a real hindrance. And no one knowing him really. Not even the medical coordinator knew him well enough to say 'you need some help here.'...He said he wasn't comfortable intruding"

Both physicians and nurses described the informal process of socializing new physicians:

" A lot of people who do come here who are a little abrasive or arrogant, I think eventually get talked to by somebody here. And I think they realize we don't do things like that here....there's always a little anxiety when a new person [physicians] comes on. I know that's true with nurses because they don't know what his skills are, or if he does something a little bit differently, that's interpreted as wrong when it isn't necessarily wrong [physician informant].

"We've had a lot of new physicians. They come in -- this is the environment -- and it doesn't take long before they have that too. I know that's supported by physician to physician as well [as by nurse to physician]."[nurse informant]

More recently, the introduction of salaried nonrotating medical directors introduced a formalized structural mechanism for socializing new physicians.

"I think that's where a [medical] director is helpful; if there's a question [regarding a new physician] they can go to him and say, 'we think this should be being done,' and if I feel there's a problem, I can evaluate the situation."

Interdisciplinary Collaboration Collaborative behavior was embedded in the notion of "getting up to speed" in this environment. Nurses talked specifically of collaboration, while physicians spoke of trusting one another's decisions, working cooperatively, and mutual respect. A pharmacist described how he learned to communicate freely with physicians by watching nurses: "There is no other discipline within a hospital that communicates as freely and as closely with physicians as nurses do...to be able to disagree with physicians within the concept of professionalism [is something the nurses model].

Nurses described some of the ways they collaborate with each other and with other disciplines to achieve better patient outcomes:

"I don't ever have to make a whole lot of decisions on my own. I use respiratory therapy; I use other nurses; I use doctors; I use all the resources I have to make decisions...In the critical care unit you have greater support because you have to support each other. Especially when you're having a crisis."

"...one thing we're doing now -- when the physicians have a conference with the family members, we go and sit along with them. So we know what is going on and we can help them keep this thing going"

They also described instances where they felt they had failed to protect the patient's care with an inexperienced doctor or nurse. The presentation of these cases as failures in collaboration suggests that the norm is to openly confront and reconcile differences of opinion regarding patient care.

"But Doctor X came to me a couple of days later and said he wanted to talk to me. And that he had talked to Dr. Z who was the medical coordinator and the physician who intubated her [the patient]. And that he felt uneasy about how the day had gone...He felt he should talk to Dr. Z to feel like where he had messed up, or where we could have done better on this. And I guess Dr. Z's response to him was 'don't be afraid to ask for help when you feel like you need it because we're all here for the good of the patient."

I said 'I felt there were a couple of key things, and that we had to work quickly...I told him it's very hard for all of us because [she was] so young."

Ethical dilemmas that surround saving lives when the quality of that life is likely to be minimal were common themes related to collaboration in both the interviews and the field notes. Many nurses shared stories of patient care in which they helped families approach physicians to withhold heroics when the patient's outcome seemed hopeless. Sometimes nurses served as intermediary and sometimes they and the physician collaborated to initiate interdisciplinary care

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conferences to discuss better ways to care for the hopelessly ill.

Both nurses and physicians viewed these ethical dilemmas as a major source of stress and conflict, with the medical directors' new role as an important one in mediating family, nurse and physician disagreement. All agreed that the change to permanent medical directors has facilitated earlier physician responsiveness to decisions to withhold or withdraw treatment from the hopelessly ill. As one physician put it:

" I think that we're dealing better with elderly patients and how to discontinue life support -- we've had some ethics conferences here...that's always a problem, but I think we're better at that now. We're better at dealing with families, and pulling back sooner."

Informants from other disciplines also spoke of the interdisciplinary collaboration and creating a climate of respect for areas of expertise. For example, the director of pharmacy viewed the decentralization of pharmacy services to the clinical unit level in 1985 as having developed good rapport among nursing, pharmacy and medical staff: "almost everything we do on an inpatient site is accomplished with and through the nursing staff, not only at the staff level, which is probably the most important level, but also in management levels so that we communicate easily across divisions."

Finally, *institutional support for patient care* was mentioned by most interviewees in the same breath as clinical expertise. Medical directors talked about staffing ratios being good, enabling nurses to attend to subtleties of patient conditions. Nurses summarized many aspects of the hospital in saying it is a "good place to work", one that facilitates their care of patients: staffing, available and working equipment; the new ICU and new equipment in both units; peer support and administrative support for "getting what you need to take care of the patients."

"...it really helps to have better staffing because it allows you time to be available to other nurses. And it reduces stress and therefore you're able to interact with each other in a more relaxed way."

Building trust, and when you build trust you can ask questions of other nurses without feeling stupid. You can ask for their opinions without their putting you down or vice versa -- you can give.

When there's stress you don't think very clearly and you might miss something that's going on with your patient."

Administrators at all levels and staff nurses who had been on the units many years spoke often of being *empowered* by the philosophy of the organization. The stated philosophy of the hospital was to put decision-making at the level of the people doing the work and "old timers" confirmed that they felt they had that power, at least with regard to patient care decisions.

One said:

"...we really realize that the focus we have here is to facilitate people that are right out on the line -- saying that management is at the bottom of the pyramid now and that the patient becomes the peak of the pyramid, or the apex of it. And then the nurse, who is right out there giving care -- or the laboratory technician in the lab, or the pharmacist directly affecting the patient -- they're the ones that need to be making the decisions about how we perform. If there's a problem right there that you can solve, that really facilitates the patient best. And also makes the person that's giving the care feel enabled and empowered to be part of the corporation and solve problems quicker."

She linked that feeling of being enabled or empowered to the other factors contributing to the quality of patient care by saying:

"We find it really helps people to get better faster because there's more team effort; people collaborate better; they support one another better and everyone's facilitated to grow clinically. So you really are with a team that's trying to achieve excellence."

The hospital, patient care services managers, and staff nurses actively involved in the nursing governance system consistently used the language of *enabling, facilitating and empowering* when discussing how they and other leaders influenced patient care through organizational resources as well as clinical expertise. Other nurses used more down to earth language to express the same

idea. They talked of the ways the organization helped them "get what I need" to take good care of patients. Nurses who had been on the units for a long time took these things for granted, although they could outline them when asked. Newer nurses frequently would describe the working climate as different from that in the place where they worked previously. They identified specific resources the organization provided for them to facilitate patient care, such as adequate staffing, working equipment, and the willingness of other departments to accommodate emergencies. Most important was the cultural expectation that your request would be honored if it was for the improvement of patient care. Nurses expressed this in such statements as: "you can stand up for what you believe in because they'll back you up: I'll go to the wall for a patient"..."you can get what you need if it's for patient care." A nursing administrator summed up the organizational support in terms of patient care:

"The skills that the nurse has to have to care for patients in this institution are phenomenal [because of the increasing technologic complexity and severity of illness]. So the pressure is to manage sicker and sicker patients throughout the organization -- not just in critical care -- and still to provide that wonderful human, caring touch that I think is what sets us apart from other professions. I think it is incredibly difficult. Finding ways to support nurses in ways that are meaningful to them...in managing that environment is not easy; that's the challenge. The good news is that we have a lot of mouthy nurses in this organization, and they are generally willing to say 'I need this and this and this.' Of the institutions I've worked in, the commitment of this nursing staff is phenomenal. Now, they may not be 100 percent committed to management, but they're 100 percent committed to the patient, and that's the important part."

Patient Satisfaction

Overall patient satisfaction with nursing care can be described for the two time periods but cannot be compared statistically, since it was not possible to use the same instrument with the 1990 patients, due to lack of personnel to follow each patient as they left the ICU or CCU. For 1990, data were used from the

hospital's patient survey, which was mailed to patients after discharge. This survey asked patients to rate their satisfaction with nursing care in specific units, one of which was ICU/CCU. Because the rating scale was different (1-10 in the hospital survey; 1-5 in the demonstration project survey) and the hospital survey had only one question, in contrast to more than 20 questions in the demonstration project survey, only a descriptive comparison is possible. The group mean for each scale was expressed as percentage of the total possible mean score to facilitate comparison.

Patient Satisfaction Remains High

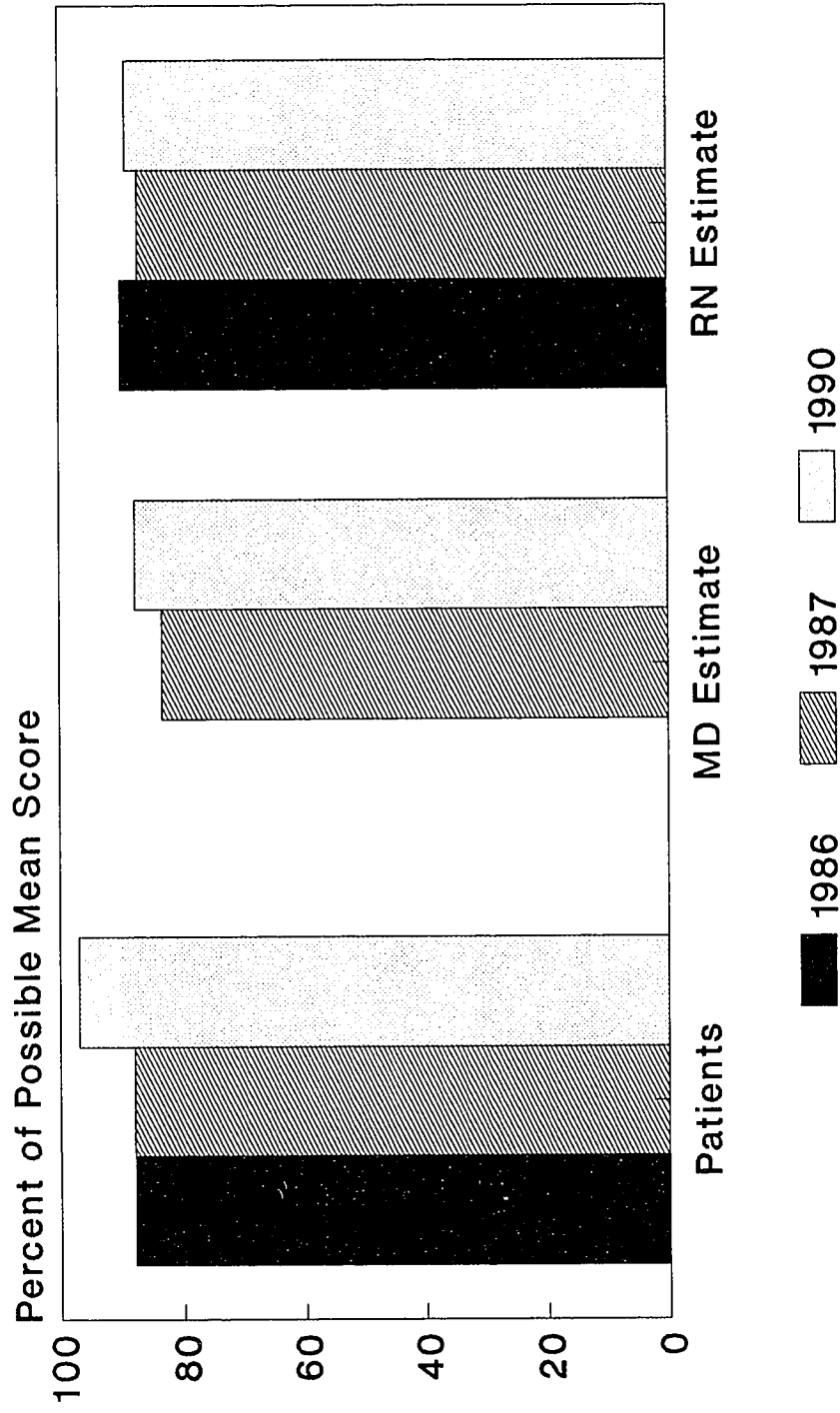


Figure III.4 Patient Satisfaction With Nursing Care Remained High

As shown in Figure III.4, patients rated their overall satisfaction with nursing care near the top of the scale that was used. In the demonstration survey in 1986-87, the mean overall satisfaction for 132 patients was 4.04 (s.d. 0.46) on a 1-5 scale, or 81 percent of possible mean score. In 1990, the mean overall satisfaction with ICU/CCU for 56 patients was 9.77 (s.d. 0.60) on a 1-10 scale, or 97 percent of possible score.

In addition, nurses and physicians estimated patient satisfaction with critical care on their surveys at both time periods. These values are more directly comparable, although their correspondence to actual patient satisfaction is unknown. The nurse and physician estimates are also shown in Figure III.4. Both nurses and physicians estimated increases in patient satisfaction over time that were not statistically significant. The mean scores as a percent of total possible scores ranged from 87 to 90 percent for nurses estimates, and 83 to 88 percent for physicians. Thus, measured a number of ways, there is support for the hypothesis that there will be no difference in patient satisfaction with nursing care.

Unit Level Organizational Outcomes

Measures of unit-level organizational performance from the system-structural perspective included nurse retention, nurse and physician estimates of unit effectiveness, and patient length of stay as a proxy for resource consumption.

Nurse Retention

Hypothesis 3.0 stated: *There will be no difference in subunit-level nurse retention following the multiple divisional changes, compared to retention rates for the same period prior to the changes.* Retention was measured as the percent of nurses remaining in the units at the end of a given fiscal year. It was calculated as 100 percent minus the crude turnover. Crude turnover is the number of registered

nurses leaving the hospital from ICU or CCU in a given fiscal year, divided by the total number of registered nurse employees of that unit. Turnover is also often expressed in terms of full time equivalent (FTE) nurses leaving relative to total FTEs on the unit times 100 percent. However, the large proportion of part-time nurses and the fluctuating actual versus budgeted hours worked during 1989-90 made it difficult to calculate a meaningful denominator using FTEs.

Furthermore, managers are faced with replacing a whole person, whether that person works part-time or full-time. For the 1986-87 period, the fiscal year was expressed June through May in order to avoid confounding the denominator by the increased hiring projected for late summer to staff the new ICU and in preparation for the beginning of cardiac surgery. For 1990, the hospital fiscal year was used (October through September). The number of nurses leaving was obtained from the hospital personnel department. For 1990, overall nurse turnover from all units was obtained from the patient care services division. There was a relatively large but not statistically significant increase in turnover for the 1989-90 period, compared to the 1986-87 year (2/46 or 4.4 percent for 1986-87; 12/108 or 11.1 percent for 1989-90; $Z = -1.33$, $p > .05$, binomial test for difference in proportions). Retention was 95.6 percent for ICU/CCU combined in 1986-87 and 88.9 percent for 1989-90. Turnover for each unit, compared by time period and compared to national turnover statistics for critical care and for the "Magnet" Hospitals are shown in Figure III.5.

The figure shows that although turnover doubled in the 1989-90 year compared to the 1986-87 year, it still remains well below the 23 percent national average for critical care units (white bar in the "other" category) (Levine, 1988). The overall 11.1 percent crude turnover rate is also well below the median 18 percent rate of the "Magnet" hospitals (stippled bar of the "other" category). The Magnet hospitals were a group of hospitals reputed to be good places to work and with high nurse retention (Kramer & Schmalenberg, 1986). Finally, the 11.1 percent combined ICU and CCU turnover for SCH is right at the hospital turnover rate

Turnover Did Not Increase Significantly

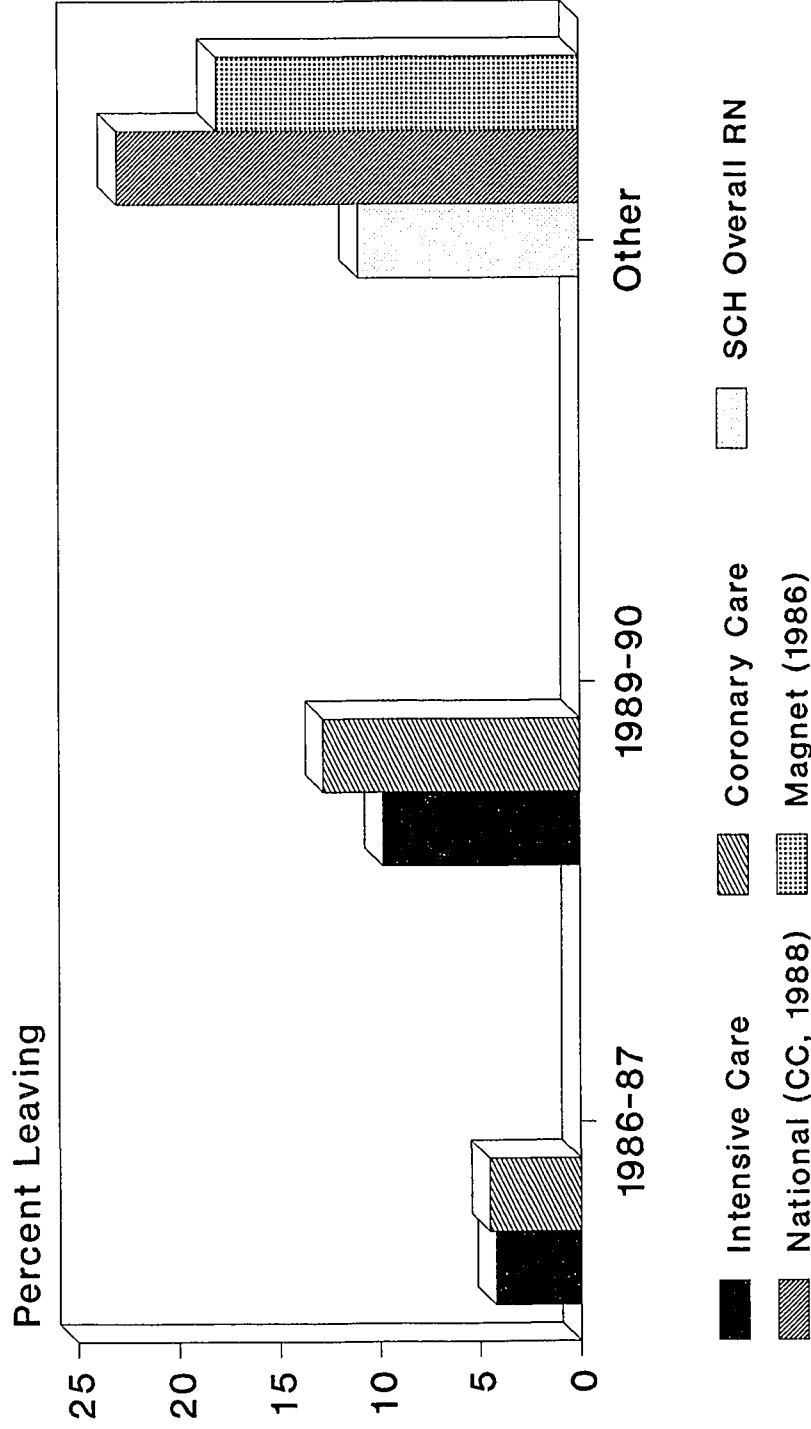


Figure III.5 Crude RN Turnover Over Time, As Compared to National Rates

for RNs (shaded bar in the category "other" in Figure III.5 Clearly, the prior turnover was exceedingly low and represented a very stable long time staff. It is not surprising to see increased turnover when a large number of new people are brought into the setting. Examination of Table III.2 shows that the ICU nurses leaving were almost entirely new hires and represented a small number of people. Ninety percent of those who left did so within 2-3 months of being hired. In CCU, half of the leavers were new hires and the other half were long term staff whose families left the area.

Table III.2: Length of Employment of Nurses Leaving Suburban Hospital During 1989-90 Fiscal Year

Months Employed at SCH	ICU	CCU
≤ 2	1	0
3-4	1	0
5-6	1	1
7-12	2	1
13-24	1	2
25-36	0	0
>36	<u>0</u>	<u>2</u>
TOTAL	6	6

Those who stayed a short time indicated they left for better salary and benefits, --- others were on-call nurses who were repeatedly not available to be scheduled and were dropped from the list of active employees. Removing these three nurses from the "leaving" group reduces the turnover rate to 6.6 percent in ICU and 10.6 percent in CCU. Only one of those who left appears to have done so from dissatisfaction with the working situations at the hospital. She told the investigator that she was dissatisfied with the new leadership and would leave when an opportunity presented itself. Overall retention decreased but not to a statistically significant degree; therefore the hypothesis is supported.

Nurse Satisfaction as a Modifier of Retention

That dissatisfaction was not a key variable in the change in turnover is also supported by comparison of nurses satisfaction from two measures. These measures tested Hypothesis 3.1: *There will be no difference in variables known to modify individual staff nurse retention (intent to stay and job satisfaction) following multiple divisional changes, compared to those variables prior to the changes.*

The Minnesota Satisfaction Questionnaire, Short Form is a general satisfaction instrument that has been used for both industrial and health care workers. The mean general satisfaction score was identical for nurses at both time periods, indicating that nurses' perceptions of group satisfaction remained high, despite numerous changes in personnel, clinical service and leaders [mean (s.d.) on a scale of 1-5: 1986-87 = 3.87 (0.34); 1990 = 3.87 (0.45)]. There was also no significant change in the satisfaction subscale of the Charns Organizational Diagnosis Survey, which measures both individual satisfaction and propensity to leave. The standard deviation was larger in 1990, suggesting more diversity of opinion [mean (s.d.) on a 1-7 scale: 1986-87 = 5.87 (.74); 1990 = 5.85 (1.02)]. Thus, hypothesis 3.1 was supported.

Only one nurse who left the hospital during 1989-90 present at the time of the 1990 survey; therefore it was not possible to directly correlate individual satisfaction with 1989-90 turnover. However, about half of the 1987 nurse sample had either left SCH, were on an unscheduled status (i.e. "on call") or did not respond to the 1990 survey. It was possible that those who did not fill out the 1990 survey or who had left prior to 1989 were dissatisfied nurses. Consequently, satisfaction of those nurses present at both surveys and those who responded only to the 1987 survey were compared. There were no significant differences in satisfaction on either measure of satisfaction or other perceptions of the work environment for these two subgroups. Therefore, there is no evidence that

dissatisfaction was related to leaving prior to 1989 or to failure to respond to the 1990 survey.

Nurse and Physician Ratings of Unit Effectiveness

Nurses and physicians were each asked questions on the Charns Organizational Diagnosis Survey about perceived overall unit effectiveness. Physicians were asked to rate the overall effectiveness of the unit (question 22) and nurses were asked if they thought care was better here than elsewhere in the area (question 45). Hypothesis 4.0 stated: *There will be no difference in subunit-level staff nurse and attending physician ratings of unit effectiveness following multiple divisional changes, compared to ratings prior to the changes.*

There were literally no differences in scores on these questions and the hypothesis was supported. Both nurses and physicians continued to regard the units as highly effective over time. [Nurses -- mean (s.d.) on 1-7 scale: 1986-87 = 5.42 (1.22); 1990 = 5.42 (1.18); Physicians -- mean (s.d.) on 1-5 scale: 1986-87 = 4.57 (.51), 1990 = 4.57 (.88)].

Resource consumption

Resource consumption for patient care might be considered the hospital unit-level equivalent of productivity and efficiency in manufacturing organizations. Critical care unit and total hospital length of stay for a matched sample of patients was compared for the two time periods. Presumably, if the patients have similar diagnoses, primary system failures and age groups, any change in length of stay represents greater or lesser efficiency of the care processes. Hypothesis 5.0 stated: *There will be no difference in resource consumption, as measured by unit and hospital length of stay for a matched sample of patients prior to and after the multiple divisional changes.*

Figure III.6 shows critical care unit length of stay in hours for the two time periods. Despite an increase in patient severity of illness (demonstrated by a mean of increase of over 1 point on the APACHE II severity of illness scale), the average length of stay in the critical care units *decreased* by 40 hours, or nearly two full days, and by 2.3 days for total hospitalization. The mean hours (\pm s.d) in critical care for 1986-87 was 128.9 (\pm 273.9) hours and 86.3 (\pm 117.4) hours in 1990. The difference in critical care unit stay is statistically significant when the natural log of length of stay is compared ($t = -2.8$, df 378, $p = .005$). Mean days in the hospital for 1986-87 patients was 14.5 (\pm 20.6) and for 1990 patients was 12.2 (\pm 19.9). Comparison of the natural log of hospital days suggests a true change for the log of days in the hospital ($t = -1.86$, $d.f.$ 378, $p = .06$), although the change did not reach significance at the .05 level.

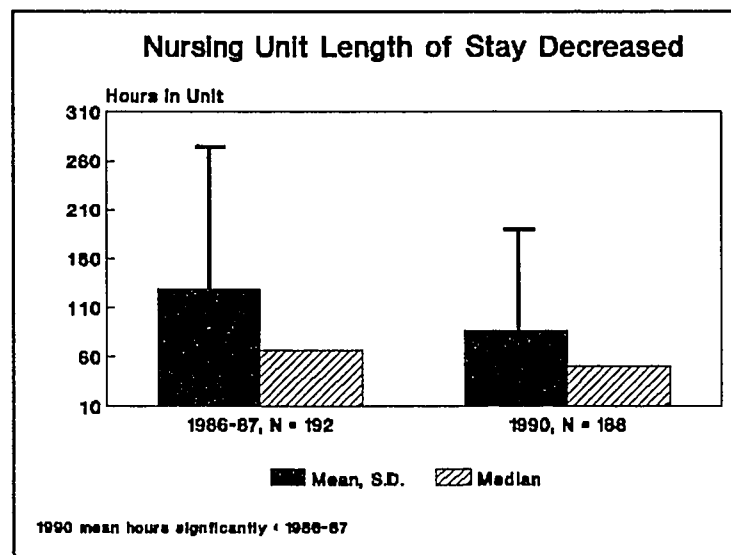


Figure III.6 Critical Care Unit Length of Stay Decreased Significantly

Nursing and medical staff felt these decreases were accounted for by 1) early interdisciplinary discharge planning and 2) earlier recognition of patients for whom continued care was futile. Nursing administrators also felt that the care coordination and community case management programs were a factor in

preventing the frequent return to the hospital of some chronically ill patients. Medicare prospective payment system had begun at this hospital in 1985. Therefore, it is not likely that the continued decrease over five years were influenced solely by the nationwide trend to decreased length of stay in response to prospective payment (American Hospital Association, 1990). Ironically, similar decreases in length of stay throughout the hospital have been cited as one cause of recent financial difficulties for the hospital (Gorlick, 1991).

Strategic Choice/Organizational Symbolism Hypotheses

Prior work in the organizational symbolism tradition suggests that these perceptions would be most likely to change if the multiple changes affecting the work unit led to a differing cultural interpretation. Therefore, Hypothesis 6.0 stated: *There will be change in indicators of subunit nursing perceptions of organizational and work environment (esprit, intimacy, disengagement, involvement, peer cohesion and supervisory support) following the multiple changes, compared to those measured prior to the changes.*

Unit Work Environment

Indicators of work environment were measured by subscales of the Moos Work Environment Scale (WES) and the Duxbury Nurse Organizational Climate Description Questionnaire (NOCDQ). The NOCDQ elicits perceptions specifically about nursing peers, while the WES is a more general instrument that does not specify the disciplinary nature of the work group. Esprit, intimacy (NOCDQ) and peer cohesion (WES) are aspects of perceived peer work group relationships, while involvement (WES) and disengagement (NOCDQ) tap the extent to which respondents perceive the unit working group to be involved or detached from the group's work. Finally, supervisor support (WES) is the perceived supportiveness of the immediate supervisor (clinical manager in this case) in accomplishing the

staff work. Because these are subscales of two instruments, the Bonferroni correction was used to adjust the alpha level for multiple comparisons. Alpha was set at .02 (.05/3 comparisons per instrument).

Table III.3 shows mean scores for nurses perceptions of work environment in 1986-87 and 1990. Mean scores on the WES subscales can range from 0-9; mean scores on the NOCDQ can range from 1-5. Thus it is evident that nurses viewed their work group as having a moderately high degree of esprit, intimacy, peer cohesion, involvement and supervisory support and low degree of disengagement at both time periods. Two-tailed tests of significance were used because the direction of change was not specified in the hypotheses.

Table III.3: Perceived Work Environment

Subscale (instrument)	1986-87 Mean of means (s.d)	1990 Mean of means (s.d.)
Relationships:		
Esprit (NOCDQ)	3.17 (0.48)	2.96 (0.66)
Intimacy (NOCDQ)	2.92 (0.59)	2.73 (0.63)
Peer Cohesion (WES)	7.73 (1.25)	6.98 (2.25)
Engagement:		
Involvement (WES)	8.63 (0.81)	8.00 (1.66)
Disengagement (NOCDQ)	1.66 (0.36)	1.69 (0.44)
Support:		
Supervisory Support (WES)	6.91 (1.69)	6.84 (1.56)
NOCDQ = Nurse Organizational Climate Description Questionnaire (low 1-5 high)		
WES = Work Environment Scale (low 1-9 high)		

The decreased perception of involvement and of peer cohesion approached

statistical significance ($t = -2.29$, $df 62.4$, $p = .025$ with separate variance estimate for involvement; $t = -1.94$, $df 67.2$, $p = .057$ with separate variance estimate for peer cohesion) and are both notable for greater variance in perceptions in the 1990 period. As described earlier, both staff and first line nursing managers felt the influx of new nurses was almost overwhelming, particularly in 1988-89. It is likely that the changes in peer cohesion and in perceived involvement of staff in the unit workings may reflect the large number of new people who are still being integrated into what was once a very stable group.

Role in Patient Welfare

A change in cultural interpretation might also affect nurses' perceptions of their role in patient welfare. Therefore hypothesis 7.0 proposed: *There will be change in indicators of subunit nursing beliefs about the organization as a place to work and the staff nurse role in patient care following the multiple changes, when compared to those beliefs measured prior to the changes.*

Beliefs about Suburban Community Hospital as a place to work were tapped in the satisfaction subscale of the Charns Job Inventory by such questions as "my work is professionally rewarding (item 13) and "the equipment and supplies I need to do my work are available when I need them (item 19). As described earlier, satisfaction remained high and did not change appreciably on this instrument. Additional beliefs about the role in patient welfare and the hospital as a place to work were tapped by items 20 (the work I do really helps patients to get better and item 31 (if a friend were looking for a staff nurse position, I'd recommend they work at this hospital). Perceptions that their work is important in patient welfare increased between 1986-87 and 1990, approaching but not attaining statistical significance (mean (s.d) on 1-7 scale: 1986-87 6.068 (0.95); 1990 6.289 (0.589), $t = 1.984$, $df 87$, $.05 < p < .10$). Mean tendency to recommend the hospital to others as a place to work decreased somewhat over time, but the

difference did not approach significance (mean (s.d.) on 1-7 scale: 1986-87 6.23 (0.684); 1990 5.96 (1.127), $t = 1.544$, $df = 86$, $.1 < p < .5$).

Thus, there is mixed support for the hypotheses predicting change in attitudes. However, since the strategic choice perspective posits a change in perceived organizational culture only if there is a concomitant change in meaning attached to organizational events, the interview and field notes were examined to determine if such a shift had occurred.

These data suggest that active processes occurred to stabilize the impact and meaning of the various organizational changes for unit nursing staff. As discussed earlier, staff nurses and managers felt the *major* change was the influx of new staff: "we're overwhelmed by all the new people...because they care so much about patient outcomes and because they are so proud of the care they deliver...they were very anxious about all the new people."

It is conceivable that the introduction of such a large group of new staff into a cohesive and stable group could have led to marked change in group relationships and perceptions of the groups' work. However, both managers and staff talked about the deliberate strategies they used to integrate newcomers. As described earlier, both formal structures and informal methods were used for orientation, precepting and shift-based supervision and support, and "showing people the ropes." An example occurred following change of shift report one afternoon. A relatively new nurse, who had come from an urban, inner city hospital was complaining about her frustration with lack of physician movement to discuss "no code" status with a dying patient's family. "You can't just tell a doctor that the patient needs to be "no code", she said. "Yes, you can", said an old-timer; "you just tell him you need to talk to him because the family has some concerns he needs to hear," and she proceeded to coach the new nurse about how to approach the physician. In contrast, one nurse who had been on the ICU for a year was

still not sure how far she should go:

"It's a really delicate thing. Because these aren't residents or interns or whatever. These are doctors that have been here a long time. And how can I, as an employee of one year come in here and disrupt...? But at the same time, we are patient care advocates. I don't want to loose my job, but I want to be somebody that's really looking out for other patients."

The aggregate perceptions of the unit and nurses role in patient care did not change, at least as measured by the paper and pencil surveys. However, the nurses indicated that a lot of hard work went into maintaining the culture as they desired it: caring, professional and epitomizing high standards. Two old-timers expressed surprise when the investigator presented these data at a unit staff meeting. They had thought there would be more change because "it seemed such hard work at the time." A nursing administrator provided her theory about why there was little measurable change:

"I think that the people that have been here a long time have earned that [the environment of mutual respect and professionalism], and then the nice thing is, once it exists, *it carries over*...It's reinforced with the people that they're working with; and they just kind of bring them along, even if that isn't consistent with the kind of places they've worked before. So I think its a real perpetuating kind of environment...it would take a lot to destroy it."

A new nurse confirmed that theory:

"And you feel real comfortable saying 'no, I don't think I can handle this case,' ... and they'll say 'well, how about you handle it and we'll back you up. I'll be there for you the whole night." Or else they'll say, 'Well, it's real busy; I don't have time to back you up, but how about if we change your assignment?' I mean, you feel comfortable doing that.

"I think it has to do with the way the people that have been here for years and are in more of a - how to say it -- upper position, more of a management position maybe in the units and stuff, are treated by their superiors. So it kind of goes all the way down the line. If they're respected and given confidence by other people they will

pass that down...And it becomes a real rolling event. So there's a lot of strokes, I feel, and a lot of help all along."

Several informants attributed the initial building of that environment and culture to the CEO and the former senior VP for Patient Care Services. Both agreed that they envisioned taking the staff from a culture of a happy, but hierarchical family to a professional team with mutual respect. They saw the "family" culture as one in which the benevolent father (physician) told the passive mother (nurse) what to do. In contrast, the professional model emphasized mutual respect and expertise, without losing warmth and compassion for the patients and for each other as human beings. Those values were clearly espoused by administrators and staff in interviews and field notes through the 1986-1990 period. Many saw the staff nurse who had been part of that early team building as the key to managing the transition in staff numbers and in division leadership: "if you can get that kind of resilience at the staff level, the managers can't screw it up."

CHAPTER IV

SUMMARY AND DISCUSSION

Ongoing change over 3 years at Suburban Community Hospital created an organizational environment requiring rapid adjustments in clinical technology, physical facility, clinical services and division leadership for the critical care units. This research used a case study design to examine the impact, over time, of multiple changes in the nursing division's organizational and clinical environments on clinical and unit-level organizational outcomes.

Because the unit first line nursing managers remained constant, the system-structural perspective predicted that these multiple organizational changes would have no effect on quantified indicators of organizational and clinical performance. There was support for hypotheses regarding lack of change in clinical performance in that patient mortality ratio remained below 60 percent of predicted and patient satisfaction with nursing care remained high.

Organizational performance indicators remained stable, except for resource consumption, which improved (manifested by decreased length of stay). Although critical care nursing retention dropped from 96 percent to 89 percent, the difference was not statistically significant, and nurse satisfaction with working at SCH remained high, as did nurse and physician ratings of unit effectiveness. Patient resource consumption, as reflected in length of stay did drop significantly for critical care unit length of stay. This increased efficiency is consistent with improved functioning in system-structural theories.

The strategic choice perspective provides the concept of organizational symbolism, or constructed meaning. This view posits that the unit-level organizational attributes, such as beliefs and values will change to the extent that environmental changes induce difference in the meaning assigned to these changes. Positional and informal leaders become important actors in this view in that they may focus

changes in the meaning constructed by the actors in the clinical environment.

Interviews and field notes provided evidence that the basic meanings of unit organizational life did not change; therefore the constancy of beliefs found in the data was predictable and supported the hypothesis. Unit nurses' aggregate ratings regarding aspects of beliefs about the meaning and importance of their work did not change significantly over time, despite the influx of a large number of new nurses, nor were there new differences between the units in patterns of belief. Further, the interviews with nurses, physicians and administrators revealed that most everyone devoted considerable energy to maintaining the values of high standards of patient care, of hard work and of a professional team in which participants respect each other and enjoy their work.

CONSISTENCY WITH THEORETICAL PERSPECTIVES

The data were therefore consistent with both theoretical perspectives. Organizational structures determine or constrain the response to changes in the unit or organization's environment in the dominant system-structural view in organizational theory. This constraint provides a structural inertia that may serve to maintain either positive or negative patterns of function (Hannan & Freeman, 1984). The hospital functions as a professional bureaucracy and bureaucracies are designed to minimize the impact of particular workers or leaders' personalities. Therefore, bureaucratic theory holds that we should not be surprised to see little change in clinical and organizational performance, despite changes in physical facility, technology and positional leadership. As one manager put it:

"once it exists [the positive climate and structures], it carries over...it's a real perpetuating kind of environment...it would take a lot to destroy it."

On the other hand, there is considerable evidence that hard work went into maintaining and transmitting the meaning attached to the critical care unit culture and work relationships. This evidence is consistent with the tenets of the more interpretive, socially relative views of constructed meaning, within the strategic choice perspective. Proponents of this perspective hold that organizations are not entities in themselves; rather they are created and altered by the people in them. These people have choices about the kinds of changes that are made and the way in which they interpret the meaning of the changes. Both workers and leaders become important in both the construction and "deconstruction" of jointly held meaning about important events in their work life (Gray, Bougon & Donnellon, 1985).

Interviews and field notes provided rich examples of the common meaning that had grown in the past decade about the standards of nursing and quality of care. Several informants specifically mentioned key administrators who had shaped those standards of personal and professional behavior -- both by specific direction and by personal example. Empowerment of staff nurses and of the "whole team" was a frequent theme. The consistent expectations of staff nurses were to really care about the patients, work hard and not just put your hours in, to behave like a professional and to respect one another. These expectations were consistent for all disciplines, not just for nursing.

It is clear from the data that there are "rules" about what constitutes good patient care at SCH, and how nurses, physicians and others are to behave in accomplishing that care. Informal processes were used for the most part to initiate the occasional newcomer into that behavior. However, the rapid changes in physical facilities and technologies overwhelmed the ability of those informal processes and several formal structures were brought into play: formal orientation, preceptors, nurse residency training programs, and paid medical directors, for example. This emergence of formerly unused structures is consistent with the

postulates of structuration theory.

The informal structure or rules of "how we do it here" had not shifted at the time of the interviews. It remains to be seen if the new people begin to make shifts over a longer period of time -- or if the very recent financial crisis is sufficient perturbation to create a more noticeable shift.

LIMITATIONS AND CONTRIBUTIONS OF THIS RESEARCH

As a case study, this research is limited in its generalizability. The focus is primarily on the clinical outcomes for patients and on the perspectives of staff nurses and nursing administrators. The findings may therefore not be as applicable to other kinds of hospital divisions. While these people are the core of the work of hospitals, their perceptions regarding the changes and their meaning may be quite different from those of non-nursing hospital administrators and other professional and nonprofessional workers in the hospital. However, the in-depth examination of the impact on nurses and patients of typical changes in a hospital division provides insight into linkages between organizational structures and the human interactions that maintain or weaken a specific organizational culture.

Contributions to Research and Practice in Critical Care

This research contributes to practice and scientific knowledge in several ways. It is the first to report clinical *and* organizational outcomes *over time* in a hospital, with respect to a constantly changing organizational and clinical environment. Desirable patient care and organizational outcomes coexisted with identifiable features of hospital organizational structure and process. Further these positive outcomes persisted over time, despite considerable change in physical facilities, technologies and nursing staff (both administrative and bedside practitioners).

These data support the findings of Knaus et al (1986) in comparing the standardized mortality rates of 13 hospitals. In that study, the lowest mortality rates were not associated with size and type (for example, tertiary University settings), but rather with hospitals where nurses and physicians collaborated well, where the hospital supported the critical care units with adequate staffing, and where structures existed to foster continuing education for nursing and medical expertise. This study extends Knaus' observations by systematically measuring these factors over time, and adding measures of organizational as well as clinical outcome.

The dissertation findings are also consistent with those of Georgopoulos and Mann (1962) in 12 community hospitals. Subjectively rated overall hospital quality of care was most strongly associated with nursing organizational factors such as high nurse:patient ratios, high proportion of registered nurses, coordination in the nursing department, and greater shared expectations among nurses and physicians. The dissertation research does not support Flood and Scott's (1987) finding that greater nursing autonomy was associated with worse surgical patient outcomes (morbidity). However, Flood & Scott measured nursing autonomy in terms of supervisor perception of independence from overall administrative authority, while this dissertation focused at the staff nurse level.

Implications for Patients. Individuals increasingly choose hospitals as well as physicians in both emergency and elective hospitalization. These data suggest there are publically available features of a hospital that might guide potential patients in those choices: mortality rates, length of stay, reputation for patient satisfaction, experience of nurses and physicians, and reputation for collaboration between nurses and physicians. Mortality rates, when adjusted for severity of illness as well as diagnosis, provide one guide to quality of care. Short length of stay benefits patients financially, but might be speculated to contribute to lower morbidity by exposing them for a shorter time to the potential secondary sources

of illness such as infected invasive monitoring catheters and other hospital-acquired infections. Further, the congruence of nurses, physicians and patients' own estimates of patient satisfaction with nursing care suggest this reputational factor may be important in choosing a place to be hospitalized. Finally, this study and that of Knaus et al (1986) suggest that nurse-physician collaboration and the presence of experienced health care professionals may be a crucial factor in quality of patient care.

Implications for Health Care Practitioners. This study and the small number of others that examine both clinical and organizational outcomes (Knaus et al, 1986; Flood & Scott, 1987; Mitchell et al 1989) strongly suggest that clinical expertise may be necessary for quality patient care, but it is not sufficient. Institutional support for clinicians, good coordination and interpersonal relations among various professionals, and structures to maintain and increase expertise are all factors that are repeatedly being shown to be equally important with individual clinical skill. In this study, nurses repeatedly spoke of their work as a group and the ways they collaborated with each other and with other health professionals. They also spoke frequently about the ways in which institutional support made visible differences in clinical care.

Nurses who are choosing critical care units in which to work might consider similar features as those suggested for patients: reputation for patient satisfaction, low mortality rates and reputation for collaborative relationships with other professionals. In addition, features such as shared governance, high professional standards coupled with good structural and interpersonal support for employees, stability of unit managers and hospital-wide mutual respect and trust were all important in the hospital studied in this research.

Physicians would do well to consider the quality of the nursing staff and the hospital's reputation for nursing care as being equally important with the kind of

technologic facilities available. Since it is impossible to disentangle the impact of nurses and physicians in such outcomes as mortality, the standards by which physician practice is judged appear to hinge on the quality of nursing care as well as on individual physician skill and judgment.

Implications for Managers. The primary respondents in this study were staff nurses and attending physicians. However, it was clear from the interviews with both staff and administrators that the unit clinical managers-- i.e. the first line managers-- were crucial people in maintaining both clinical and organizational stability. These managers, in turn, acknowledged their need for structural and interpersonal support from those above them in the division. In particular, they emphasized the need to be able to trust others in management, both for material support and for interpersonal support. They were key people in both theoretic points of view: buffering and stabilizing forces for the many structural changes, as well as supporters of the staff nurses in maintaining and transmitting the patient care values.

From a *methodologic* perspective, the design illustrates the importance of using multiple methods, or triangulation, in organizational studies to fully capture the nature of change. The quantitative data demonstrating stability of clinical and organizational performance would have been sterile without the illustrative material from the interviews. The interviews would have been anecdotal without the repeated evidence of stability provided by the quantitative data. Finally, the data affirm the importance of individuals (both leaders and staff), but within a multiple environmental context. Individuals were identifiable as setting directions, but the enacted environment of many individuals were equally important in carrying on those directions.

Directions for Further Research

This was a case study and therefore described only one hospital division's features. That pattern provides a template against which we might examine other ways of organizing critical care and their relationship to desired patient, staff and organizational outcomes. This single case provides a picture of one way to achieve high quality care, along with high staff morale. It will be useful to examine multiple cases to better describe other patterns that result in desirable outcomes, according to the principle of equifinality in systems terminology. Both interpretive and objectivist methods should be used to capture the historical constraints and the ongoing processes. Such a study is now underway in 27 critical care units.¹ The study is funded by the National Institutes of Health to delineate the combinations of critical care unit structure and process factors that best predict desired organizational and clinical outcomes such as mortality, quality of care, and nursing retention. The findings from this type of comparative research can then be used to design critical care unit organizational change intended to improve patient care and unit organizational function.

In addition, there are interview and field note data from this dissertation that can be further explored and expanded by interviewing nurses and managers in other critical care settings. For example, it would be useful to explore how experienced nurses teach newer nurses "how we do it here". Are there differences in interpersonal style or in formal structures for orientation between units that are and are not successful in maintaining and transmitting their culture? Are the processes different for units with more and less effective clinical outcomes? The

¹ Mitchell, P., Hegyvary, S. & Sechrist, K.: Critical care nursing systems, retention and patient outcomes. Grant number RO1 NR02343, National Center for Nursing Research, National Institutes of Health.

similarities in staff nurse and administrator values were addressed in this study. Differences in manager versus staff shared meaning are also of interest. Interviews suggested that staff and managers responded differently to the turmoil surrounding the changing of middle and executive level leadership. Further research might explore those differences more fully, as well as a more full explication of managers perceptions of their work environment. Comparative case study would allow linkage of those similarities and differences with differences in unit organizational effectiveness.

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APPENDIX 1

Leader Succession Literature Summary

Stewardship/succession studies were located through review works and hand and computer searches of the organizational and management, psychology, sociology, medicine, nursing and health care management literatures (Grusky, 1960; Helmich, 1977; Bass, 1981; Gordon & Rosen, 1981; Brady & Helmich, 1984; Gross & Etzioni, 1985; Bryman, 1986; Hall, 1987; Burns & Becker, 1988; Romanelli & Tushman, 1988; Gupta, 1988; Day & Lord, 1988; Fuzard & Tilby, 1989). No single review source cited more than half the papers found. Perhaps this reflects the lack of integration of this area into the more general leadership and organizational literature. Overall, 51 research works were found, some of which have not been previously cited as succession studies.

The general organizational succession/stewardship studies have examined sports teams as proxies for complex organizations, artificial task groups in laboratories, social service, political, publishing and industrial organizations. The vast majority have implicitly adopted the system-structural view. The findings have been mixed with regard to the relationship between either stewardship or succession and indices of industrial performance. The more mathematically sophisticated the design, the more complex the relationship, but in no case did the leadership variable account for a large percent of the variance in organizational performance. As a whole these studies support the notion that the context of leader change is as important as the traits, styles and origins of the individual leaders. These studies are summarized in Tables A through E.

TABLE 1A: STEWARDSHIP STUDIES

AUTHOR	DESIGN	KIND OF LEADER	MEASURE OF PERFORMANCE	RELATIONSHIP: CH./PERF.
Lieberson & O'Connor (1972)	Retrospective, Time Series, secondary sources (N=167 firms, 20 yrs, 13 industries ANCOVA analysis	Pres. or Chmn of 800 (CEO)	Sales, Net earnings, profit margin (profits/sales)	Leadership accounted for 6.5 to 14.5% of variance in dependent variables when year, industry & company accounted for; increased to 31% for profits with 5 yr. lag
Salancik & Pfeffer (1977)	Time Series, retrospective, secondary sources (N = 30 cities over 18 yrs) ANCOVA analysis	Mayors	City income; discretion as reflected in expenditure variation	City effect accounted for greatest variance (med. 79%) attributable to mayor, city, year Mayor accounted for <10%
Weiner & Mahoney (1981)	Times Series, retrospective, secondary sources (N = 193 firms over 20 yrs) Multiple regression	CEOs of manufacturing firms	Profit level, profitability (profit relative to assets), stock prices	Corporate size explained largest % variance in profit (81%), leadership 17.8-49% depending on variable No change in outcome with 2-5 yr. lag time
Thomas (1988)	Time Series, retrospective, secondary sources (N=12 firms over 20 yrs) ANCOVA	CEOs, U.K Retail firms	Profit, Sales, Profit margin	60-70% unexplained performance variance in profits, sales attributable to leadership; contends effect obscured when averaging across industry
Zajac (1990)	Survey + secondary, cross-sectional (N=118 CEOs) Multiple regression	CEOs/large industrial corps.	Firm performance = average return on assets during CEO tenure	Firms with CEOs promoted from inside significantly more profitable; 20% variance in performance related to CEO selection & compensation

TABLE 1B: GENERAL SUCCESSION

AUTHOR	DESIGN	KIND OF LEADER	MEASURE OF PERFORMANCE	RELATIONSHIP: CH./PERF.
Jackson (1953)	Experimental (N=6 exp.; 3 control.)	Foremen: telephone repair/installation crews	Attitudes toward immediate supervisor	Improved when successor had rated high by prior group; decreased with lower rated successor; no change control
Hamblin (1958)	Experimental (N=24 3 person groups; 12 exp.(crisis), 12 cont.)	Task groups with emerging leaders Shuffleboard rules	Replacement of leadership; centralization of leadership	No diff. in centralization crisis vs. noncrisis; more leader replacement in crisis groups
Grusky (1962)	See summary in Table C: Rate of succession studies (baseball managers)			
Gamson & Scotch (1964)	Retrospective, secondary data source not specified (N = 22 midseason changes over 7 years) Descriptive	Major league baseball managers	% games won at 4 points in the season	Equivocal findings: improved performance in 13 of 22 cases comparing immediate pre-post manager change record
Grusky (1964)	Replication of Gamson & Scotch study Secondary source from newspapers, baseball records (N=23 changes) Descriptive	Major League baseball managers	% games won at 4 points in the season	Improved performance in 14 of 19 cases comparing immediate pre-post manager change record; 77% with inside succession improved vs. 50% with outside succession
Stotland & Kobler (1965)	Case Study (N=1) Interviews, archival data over 10 year hospital life span	Medical Directors, administrators & Directors of Nursing private mental hosp.	Staff morale, patient suicide	Declining morale ("loss of hope") "epidemic" of patient suicides
Eitzen & Yetman 1972	See summary in Table C: Rate of succession (college basketball coaches)			
Meyer (1975)	Modified time series Survey (N= 215 depts 1966, 1972) Correlational and Cross-lagged path model	Leaders of gov't finance depts	Org. structure (size of dept, # of divisions, # levels of supervision # of subdivisions)	Autocorrelations for structural variables higher for depts with longer tenured heads (thus, less turnover); Higher autocorrel. for heads not dependent on political appt.; path analyses suggest causal relationships between

Gephart (1978)	Ethnography Case analysis (N=1)	Chairmanship of student org. comm- ittee	Succession events	environmental demand, dept size & structure when leader- ship unstable & less autono- mous
Allen, Panian & Lotz (1979)	Time series, retro- spective, secondary source (N = 934 team seasons over 53 years) ANCOVA, path analysis	Major league Baseball managers	% games won in regular season Managerial succession rate & rate of personnel turnover	Performance or effectiveness of group not studied. Pro- poses that organization mem- bers negotiate a shared org- anizational scheme against which successors are "tested"
Osborn, Jauch, Martin & Glueck (1981)	Structured content analysis of cases, secondary sources (N = 313 industrial corporations) Multiple discriminant analysis	CEO	Return on assets, in context of change in corporate strategy (8 categories), environmental conditions (10 variables)	Current performance most strongly related to past team performance, accounting for 46% of variance in current performance. Managerial & player turnover add only 1- 2% to explained variance. In teams with succession, inside, between season assoc. with better later perform. than other types.
Brown (1982)	Time series, retro- spective, secondary sources (N= 26 teams over 9 years) Multiple regression, pooled time series, cross-sectional model	National Football League team head coaches	% games won in regular season, controlling for general org. variables & type of managerial succession	Event of succession correctly classified by all variables in 67% of cases, nonsuccess- ion 76%. Significant predic- tors were financial strategy, prior profits, socioeconomic, supplier & owner volatility
Carroll (1984)	Time series, retro- spective, secondary source (N = 2137 newspapers, 175 years) Hazard of death (Makeham model) plotted as survivor function	Newspaper publish- ers	Rate of org. death	Negative correlation between performance and head coach succession in current season (r= -.396), past season (r= -.25) & no. new players (r = -.585), together explaining 38% variance in performance
Smith, Carson	Time series, retro-	Methodist ministers	Church membership, property	Rates of org. death increase following succession of founder, regardless of type of initial control (family, corporation, etc.)
				Prior ministerial effective-

<p>& Alexander (1984)</p>	<p>spective, secondary source (N = 50 ministers over 20 yrs) Multiple regression, Box-Jenkins ARIMA</p>	<p>value, annual giving, total giving, salary</p>	<p>ness (estimated from salary) best predictor of all performance variables; presence or absence of succession event did not add to variance explained, either immediately or with 4 year lag</p>
<p>Pfeffer & Davis-Blake (1986)</p>	<p>Pooled cross-sectional and time series (N= 22 teams over 5 seasons) Multiple regression (Generalized least squares)</p>	<p>% games won during regular season</p>	<p>Past season team performance & # new players strongest correlates of current performance (r =.52,.59) Succession alone was not a significant predictor of performance. How ever, succession with prior coach good record, experience did positively affect current performance</p>
<p>Singh, House & Tucker (1986)</p>	<p>Structured interviews, retrospective, secondary source (N = 389 orgs. over 12 years) Hazard of death function (Makeham-Gompertz model)</p>	<p>Organizational death, as function of change in CEO, service area, goals, sponsorship, location, organizational structure</p>	<p>CEO change in first 6 years significantly decreased rate of org. death (interpreted as aiding in adaptation to environmental demands); effect remained when all changes modeled simultaneously</p>

Author Names in Boldface indicate studies of hospital or health care organizations

TABLE 1C: RATE OF SUCCESSION

AUTHOR	DESIGN	KIND OF LEADER	MEASURE OF PERFORMANCE	RELATIONSHIP: CH./PERF.
Trow (1960)	Experimental (N = 24 teams, 7 treatments with varying succession rate)	Laboratory task groups; rate of team member succession varied	Time to complete task (common symbol problem)	Minimal relationship between rate of replacement & time; however, change in performance from previous trials significantly affected by relative # replacements & relative ability of group member
Trow (1961)	Secondary analysis of case descriptions	CEOs/small manufacturing com.	Profitability (operationally undefined)	No relationship between rate of succession & profitability Lack of succession planning related to diminished profit
Grusky (1961)	Modified time series Secondary sources (N= 53 firms at 10 year interval) 2x2 correlational analysis	"Key job titles" (e.g. CEO, /BOB controller)	None; presence of succession vis-a-vis size (26 largest; 27 smallest)	Succession more common in large vs. small firms; Relationship not statistically significant
Grusky (1962)	Time series, retrospective, secondary sources (N = 16 teams over 27 years) Bivariate correlation	Major league baseball field managers	Team standing in league at end of regular season: Period I (1921-41), Period II (1951-58) & combined periods	Negative correlation between mean mgr. succession rate and rank order of team standings; (r = -.4 to -.6) teams with shorter mgr.tenure more likely to have decreased performance Pd.I to Pd. II.; equally strong correlation between game attendance and rank-order team performance
Kriesberg (1962)	Survey (N= 226 depts) Descriptive	Heads of public health & mental health state & local depts	None: self-reported tenure of head	Shorter tenure in departments < 500 employees; slightly longer tenure in states with single party-dominated legislatures (implying political factor in tenure)

Pryer, Flint & Bass (1962)	Experimental (N=17 ROTC student groups)	Task groups; match to criterion task	Public/private leadership; public private effectiveness	Groups changing leadership least for latter trials were most effective
Grusky (1970)	Survey (N= 2 orgs; 1871 respondents) Descriptive	Utility company managers; military officers	Perceived authority, tenure, org. commitment, community involvement	Perceived authority somewhat greater at higher ranks in military; tenure greater in business; org. commitment slightly greater in military; commun. involvement similar; infers effects of succession from military rotation
Eitzen & Yetman (1972)	Retrospective, Survey + secondary sources (N = 657 coach changes in 129 colleges) Bivariate correlational	College Basketball coaches	% games won	Small negative correlation (r = -.24 without incumbent coach, r = -.16 with current coach) between # coach change and overall % games won; when preceding coach % won controlled for, no relationship between turnover and performance
Helmich (1974b)	Survey (N= 140 presidents) Secondary sources, 2x2 correlational	Presidents, petrochemical firms who experienced succession in 1970-72 with at least one prior succession	None: successor origin and leader style (task vs. employee-oriented) related to predecessor turnover (high: >1, low: 1)	No significant relationship between high/low predecessor turnover & origin. Task-oriented successor more likely in firms with > 1 previous succession
Pfeffer & Salancik (1977)	Survey (N= 57 hosp.) Bivariate correlational	Chief hosp. admin.	Tenure (length of time in current position)	Hospital size positively related to inside succession & more formal training in hospital administration. Context more strongly related to tenure and admin. training than was size.

Allen, Panian & Lotz (1979) See summary under Table B: General Succession Studies

Salancik & Pfeffer (1980)	Cross-sectional survey & secondary sources N = 84 corporations, Bivariate correlation, multiple regression	CEO of industrial firms with 3 types of control: external, owner, management 10 years	CEO tenure as of Jan. 1972; performance: average rate of return on investment over prior 10 years; average profit margin over prior 10 years	CEO tenure unrelated to performance for owner managed firms; longer tenure for CEOs who were major stockholders. Tenure positively related to performance for external and manager-controlled firms.
Pfeffer & Moore (1980)	Time series; secondary sources (N = 20 departments over 20 yrs) Multiple regression	Department heads 2 state university campuses	Average tenure as dept. head Growth of department (# faculty)	Average tenure positively related to level of disciplinary paradigm development, weakly related to departmental size & growth
Allan (1981)	Secondary sources N = 218 firms, cross-sectional, multiple regression	CEO, industrial firms	Managerial tenure, related to corporate control, profitability	Corporate control (owner, manager, outside) had significant effect on CEO tenure, controlling for size and performance
James & Soreff (1981)	Secondary sources (N = 286 firms in 1965; hazard model	CEO, industrial firms	Percent of involuntary succession Profitability	Probability of being fired increased with least profitable companies
Allan & Panian (1982)	Time series (N = 224 firms over 10 years, secondary sources, ANOVA, ANCOVA & 2x2 correlational	CEO, industrial firms	Profitability; manager power (direct family control, indirect family control, management control)	Management power (type of firm control) explained 19% of variance in tenure beyond that accounted for by org. performance.
Freund (1985)	Retrospective survey (random sample Univ. city hospitals N = 172 DON & 126 CEOs from 204 hospitals) Descriptive	Directors of Nursing (DON)	Tenure	Average reported tenure over 10 yrs. = 3.4 yrs; 40% reported involuntary resignation
Freund (1987)	Retrospective survey (N = 118 CEOs from same sample as in Freund 1985) Descriptive	CEO	Chief nursing officer (CNO) tenure relative to CEO succession	Average CEO reported tenure over 10 yr. period = 5.6 yr; 12.2% of newly appointed CEO terminated current CNO; 54.5% did not; 33.3% unknown

<p>Harrison, Torres & Kukalis (1988)</p>	<p>Computer database (N=671 over x yrs) Time series, secondary source Log linear instantaneous rate of turnover</p>	<p>CEOs, BOD chairs manufacturing firms</p>	<p>Exec. turnover as function of prior profitability, firm size debt, outside BOD, struc. top positions</p>	<p>Best predictors of CEO turnover were return on assets, firm size, & predecessor re- tirement. Separation of CEO/ Board chair positions was best predictor Bd. chair turnover</p>
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Author Names in Boldface indicate studies of hospital or health care organizations

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TABLE 1D: SUCCESSOR TRAITS AND STYLES

AUTHOR	DESIGN	KIND OF LEADER	MEASURE OF PERFORMANCE	RELATIONSHIP: CH./PERF.
Gouldner (1954)	Case Study (N=1)	CEO/gypsum plant	Interpersonal stress; bureaucracy productivity	Increased tension, increased plant mgr. turnover decreased worker productivity (inferred but not measured)
Guest (1962a & b)	Case study, Natural Experiment (N=1) Descriptive	Plant Manager, auto manufacturing	Direct & indirect labor costs, absenteeism, # grievances, turnover, quality performance, safety record attitudes, patterns of interaction	Decreased stress, decreased climate of fear, increased productivity, decreased cost, decreased grievances, moved from bottom to top of six plants in all descriptors
Goldman & Fraas (1965)	Experimental (N=32 groups; 4 types of leader selection	Task groups: 1) No designated leader 2) arbitrarily appointed leader 3) leader appointed on basis of pre-trial performance 4) elected leader	Difference in time and # trials to correct answer (20 questions game) between pre-trials and trials after leader change	Groups with leaders selected by ability had greatest improvement in time and # trials, followed by groups with elected leaders (4x4 ANOVA). Both appointed and leaderless groups slower than others
Kotin & Sharaf (1967)	Case study (N=1) Interview, participant observation	Superintendent State mental hospital	None, described interpersonal responses to change from tight to loose administrative style	Criticism by "old guard" of new ways, some resignations; new freedom & autonomy for those who moved in the new direction
Helnich (1974b)	See summary under Table C:	Rate of Succession studies (Presidents - petrochemical companies)		
Kirschenbaum & Goldberg (1976)	Survey (N= 194 in Israel) Step-wise multiple regression	Recent grads in indust./management engineering	Propensity to move between org.	Multiple personal, occupational, educational & situational factors together predicted only 14% of total variance in propensity to move
Koch (1978)	Pre-post natural experiment Survey (N=8 supervisor respondents)	Plant mgr, garment factory	Manager leadership style, peer leadership among supervisors, group processes, supervisor satisfaction	Successor perceived as more task-oriented, decreased peer leadership, no change in group process, overall satisfaction
Sredl (1982)	Survey (N=66 admin. 2x2 Correlational	Nursing service directors	None, examined personality characteristics of those reporting forced	12.1% reported forced resignation or termination; no

resignation

significant relationship
between personality traits
and forced resignation.

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resignation

significant relationship
between personality traits
and forced resignation.

Author Names in Boldface indicate studies of hospital or health care organizations

TABLE 1E: SUCCESSOR ORIGINS

AUTHOR	DESIGN	KIND OF LEADER	MEASURE OF PERFORMANCE	RELATIONSHIP-CH./PERF.
Carlson (1961, 1962)	Survey N=100 districts Descriptive	Calif. School district superintendents	Rate & # central administrative positions added; reputation No educ. performance measures	Outside successors increased positions significantly vs. inside successors, and at twice the rate; outside successors more well known
Grusky (1964)	See summary under Table B: General Succession Studies (Baseball managers)			
Helmich & Brown (1972)	Retrospective, secondary + survey data N = 208 firms with succession in prev. 10 years; correlational	Presidents; chemical & allied man-	Organizational change: admin. turnover controlling for profitability; size	Significantly greater org. change with outsider success. Effect lost when controlling for predecessor org. performance (profitability)
Helmich (1974a)	Time series, retrospective, secondary sources, (N=29 firms with succession, 1964, 1968) Bivariate correlational	CEOs, Manufac.	% change product diversification; \$ sales, 800 size, # subsidiaries	Low growth following insider succession; no clear pattern for high growth; relationship differed for dependent vars.
Helmich (1974b)	See summary under Table C: Rate of Succession Studies (Presidents - petrochemical firms)			
Daum (1975)	Experimental (N= 128 individuals in 4 member teams	Task groups with 4 types of succession (task: build-Erector Set constructions	None: examined attitudes toward leader after change announced but before working with new leader; motivation to return for 2nd session, and # voluntary returns for nonrewarded activity	Individuals in groups with outside successors had greater satisfaction & group cohesion measured prior to working with new leader
Allen, Panian & Lotz (1979)	See summary under Table A: General Succession Studies			
Brady, Fulmer & Helmich (1982)	Survey, cross sectional (N=1484) Bivariate correlational	Am. Mgmt Assoc. Corporate Pres.	Anticipated tenure as President	No difference in anticipated tenure for insider vs. outsider. Formal succession plans & org. problems associated with shorter outside pres. anticipated tenure
Brady & Helmich (1983)	Survey (N= 97 admin., 23% return) Bivariate	Administrators of Catholic hospitals	Perceived organizational improvement since own succession	Greater improvement perceived by outside successors

	correlational	ors
Reinganum (1985)	Cross-sectional, secondary source (N = 667 firms) Linear regression	Stock price returns (daily price/initial price) on the five trading days surrounding the public succession announcement
	Pres./Chairman of firms trading on NY and Am. Stock exchange	Significant increase in market value of stock with external succession in large firms, no significant difference in internal successors regardless of firm size, or in large firms with external successors

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	correlational		ors
Reinganum (1985)	Cross-sectional tional, secondary source (N = 667 firms) Linear regression	Pres./Chairman of firms trading on NY and Am. Stock exchange	Stock price returns (daily price/ initial price) on the five trading days surrounding the public succes- sion announcement
			Significant increase in mar- ket value of stock with ex- ternal succession in large firms, no significant diff- erence in internal success- ors regardless of firm size, or in large firms with ex- ternal successors

APPENDIX 2

PROPERTIES OF INSTRUMENTS

- A. Instruments to Measure Clinical Performance
 - 1. APACHE II - Physiologic stability & predicted mortality
 - 2. Patient Satisfaction Instruments

- B. Instruments to Measure Organizational Performance
 - 1. Personnel records - Nurse turnover/retention
 - 2. Charns Organizational Diagnosis Survey - nurse satisfaction, unit effectiveness
 - 3. Minnesota Satisfaction Questionnaire - nurse satisfaction
 - 4. Unit logs, patient records - resource consumption

- C. Instruments to Measure Aspects of Organizational Symbolism
 - 1. Work Environment Scale - beliefs about work environment
 - 2. Nurse Organizational Climate Description Questionnaire - beliefs about peer work group
 - 3. Charns Job Inventory - beliefs about role in patient welfare, organization as place to work

- D. Interview Schedules
 - 1. Staff nurses regarding clinical judgments and nature of their work
 - 2. Administrators regarding changes and impact of changes at SCH

- E. Secondary Sources Used to Establish External Environmental Description

INSTRUMENTS TO MEASURE CLINICAL PERFORMANCE

1. *APACHE II (Acute Physiology and Chronic Health Evaluation)* was used to describe physiologic stability and to predict mortality for the group of patients in the two time periods.

A single score represents the weighted bipolar distance from normal values of twelve physiologic variables, plus weighted scores for age and chronic health status. The worst score in the first 24 hours is used to predict mortality for a group of patients (Knaus, Draper, Wagner & Zimmerman, 1985; Wagner, Knaus & Draper, 1982). The prediction algorithm assigns weighted probabilities of dying, based on primary system failure, degree of physiologic abnormality, age and chronic health status. Content validity for the physiologic variables was derived from nominal group process with expert clinicians. Predictive validity is 85.5% correct classification of 5030 patients with known risk of death, assuming a 50% risk; sensitivity was 94.9%, specificity 47% (Wagner et al, 1983). This instrument also provides demographic data regarding the patient's principal medical diagnosis, age, entry to the hospital, and other relevant data.

Interrater reliability between two raters for this dissertation data was 98% agreement in the 1986-87 sample and 95% agreement in the 1990 sample.

Standardized mortality ratio (SMR) was the patient outcome used in this study to describe clinical performance. Standardized mortality ratio is the ratio of actual to predicted deaths in a specified group of patients. The predicted deaths were calculated from the Acute Physiology and Chronic Health Evaluation (APACHE II) instrument, weighted for severity of disease and presenting disease process. Actual deaths are obtained from the discharge records of a sample of patients matched to the original sample by disease category and age.

2. *Patient Satisfaction Instruments*

Patient satisfaction was measured in the 1986-87 sample by Hinshaw and Atwood's *Patient Satisfaction with Nursing Care* questionnaire (Hinshaw & Atwood, 1982). This 25 item scale is the most extensively replicated of the patient satisfaction instruments. Although there are three subscales, only the overall satisfaction was used, with possible mean scores ranging from 1 to 5. Coefficient alpha for the instrument is reported as ranging from .784-.876 (Hinshaw & Atwood, 1982), and .91 for the prior sample in the proposed study (Mitchell et al, 1989).

Due to lack of personnel in 1990, it was not possible to distribute the Hinshaw and Atwood instrument. Instead, the hospitals own Likert scale overall satisfaction instrument was used. One item asked patients to rank their overall satisfaction with nursing care in one of several units if they had been a patient in that unit. ICU/CCU was listed as one unit, with the ranking ranging from 1 (very dissatisfied) to 10 (very satisfied). A frequency listing of all responses in January and February of 1990 was obtained from the hospital public relations department.

Finally, items 13 and 9 on the physician opinionnaire and nurse job inventory of the Charns Organizational Diagnosis Survey (see instruments used to measure organizational performance) asked respondents to rate the degree to which patients are pleased (or satisfied) with the care received. The physician scale rated from 1 to 7 and the nurse scale from 1 to 5.

INSTRUMENTS TO MEASURE ORGANIZATIONAL PERFORMANCE

1. Personnel records - Nurse turnover/retention

Nursing turnover (and its reciprocal, retention) were measured as crude turnover: the number of registered nurses employed on the units who voluntarily left the hospital during a fiscal year divided by the total registered nurses employed in the unit in the same time period. These data were obtained from the hospital personnel records, which have the data of hire of individual nurses, and the date and reason for termination. They were validated by the clinical directors of each of the units to avoid counting non-nurses (for example unit clerks).

2. Minnesota Satisfaction Questionnaire

Nurse satisfaction was measured by the *Minnesota Satisfaction Questionnaire (MSQ)*, short form, a 20 item instrument widely used in organizational research to measure the dimension job satisfaction as an organizational outcome. It is unidimensional, implicitly considering satisfaction as the opposite pole of dissatisfaction. Test-retest correlations for the tool development are reported as .89 for one week and .70 for one year, with median Hoyt reliability coefficients of .86 for the intrinsic scale, .80 for extrinsic and .90 for general satisfaction (Weiss, Dawis, England & Lofquist, 1979). Coefficient alpha in the pre-leadership change critical care nursing sample was .86 for general satisfaction, .81 intrinsic and .72 extrinsic satisfaction, with test-retest stability at six months at $r = .60$ (Mitchell et al, 1979).

3. Charns Organizational Diagnosis Survey - nurse satisfaction, unit effectiveness

Nursing satisfaction and propensity to leave was also measured by the *Charns'*

Organizational Diagnosis Survey (CODS). The CODS is a multi-instrument survey used to measure a number of the organizational characteristics of the unit (nurse demographics, unit processes, coordination, collaboration, satisfaction and propensity to leave, perceived effectiveness outcomes). The inventory was developed in a study of components of unit patient care effectiveness in a large Eastern teaching hospital and refined in an action research program in a residential program for emotionally disturbed children (Charns, Stoelwinder, Miler & Schaefer, 1980; Strayer & Charns, 1982). The *demographic questionnaire* consists of 13 items describing such aspects of the respondent's personal and professional characteristics as age, gender, experience, certification and the like. The *job inventory* is a 45 item Likert type scale measuring four dimensions of the nurses' work: unit processes and meetings, satisfaction and propensity to leave, stress and frustration, and physician-nurse collaboration. Coefficient alpha was reported as .92 for the satisfaction factor (Strayer & Charns, 1982), with our prior sample showing an overall coefficient alpha at .75, and the satisfaction subscale at .79, unit process .83, collaboration .53 (Mitchell et al, 1989). Convergent validity is claimed in that effectiveness ratings of administrators, nurses and physicians were consistent in a large urban hospital. Internal consistency for the total questionnaire is reported at .96 (Charns et al, 1980). (CODS)

4. Unit logs, patient records - resource consumption

Length of stay in the critical care units and in the hospital was used as proxy for resource consumption, based on the assumption that the longer the stay, the greater both the true cost and the charges. Unit census logs were used to record the hours in critical care. The exact time of admission and discharge from the unit is recorded by the unit secretary and is the basis for the charges made to the patient for critical care. Hospital length of stay is recorded in days by the personnel in medical records after patient discharge. This data was obtained from

the medical records of the patients for whom the APACHE II data was recorded.

INSTRUMENTS TO MEASURE ASPECTS OF ORGANIZATIONAL SYMBOLISM

1. Work Environment Scale - beliefs about work environment

The Moos *Work Environment Scale (WES)*, was used to tap selected aspects of staff nurses' beliefs about the unit work environment. The WES is a widely used general purpose inventory, with standard scores normed on health care workers. The tool has ten subscales and three dimensions. The subscales of interest are components of the relationship dimension (peer cohesion, involvement) and system maintenance (supervisor support). Respondents mark each of 90 items on the entire instrument "true" or "false", and a template is used to score the items such that a scale score represents the total number of items endorsed positively by the respondent. Negatively worded items are automatically scored in reverse by the template. Thus, the higher the score, the greater the extent to which a dimension is present. Internal consistency (coefficient alpha) for the real form is reported as ranging from .69-.86 for 1045 general and health care workers, with test-retest reliability at one month (N=75) ranging from .71 to .82 for all scales (Moos, 1986). In our preliminary work, coefficient alpha for the total scale was .65, with a 6 month test-retest coefficient, $r = .63$ (Mitchell, et al, 1989).

2. Nurse Organizational Climate Description Questionnaire - beliefs about peer work group

The *Nurse Organizational Climate Description Questionnaire (NOCDQ)* measures the perception of a group of nurses regarding behaviors of the leader and behaviors of the subordinates with regard to the organizational climate of their work setting. It was modified for nursing care settings by Duxbury, Henly & Armstrong (1982), and validated in neonatal critical care units. The 32 item scale

was factored into 6 subscales: aloofness, humanistic thrust (behaviors of the nurse leader), esprit, intimacy, disengagement and hindrance (behaviors of the work group). Only the beliefs about the peer group (esprit, intimacy and disengagement) were used for this study. Coefficient alpha for the development study ranged from .51 to .83 and from .45-.78 for the cross validation (Duxbury et al, 1982). In our sample, coefficient alpha ranged from .36 to .83 for time 1 and .41 to .75 for time 2, with 6 month test-retest stability at $r = .63$ (Mitchell et al, 1989).

3. Charns Job Inventory - beliefs about role in patient welfare, organization as place to work

Finally, specific items were used from the CODS regarding staff nurses' beliefs about the units as a place to work (item 31: If a friend were looking for a staff nurse position, I'd recommend they work at this hospital) and the staff nurse role in patient care (item 20: the work I do really helps patients get better).

INTERVIEW SCHEDULES

1. Staff nurses regarding clinical judgments and nature of their work

Data had been previously collected in the AACN Demonstration Project to amplify staff nurses's perceptions of their clinical judgment and the nature of their work in patient care. These transcribed and coded interview were reviewed in light of the organizational questions asked in this research. Nurses were interviewed by two of the AACN Demonstration Project staff. They were asked to tell about a patient with breathing problems who was important to them. Interviewers did as little directing of the interviews as possible, attempting only to clarify the informants' statements. Interviews were transcribed and checked with the tape recording and coded for themes using consensus coding of three raters.

2. Administrators regarding changes and impact of changes at SCH

This investigator interviewed 12 current and former administrators in the hospital and patient care services division between April 1990 and February 1991. The initial question to each was: "there have been many changes at [SCH] since we first surveyed nurses at the beginning of the Demonstration Project. Do you think we might see measurable changes in patient care outcomes or in the way nurses and doctors perceive the organization as a result of these changes?" Informants were given the opportunity to outline what changes they thought were important and how they might affect patient care. They were also asked to comment on what impact the rapid succession of critical care and patient services administrators might have had, and extra-institutional pressures that might affect patient care. Finally, they were asked: "what would you say are the key values of this organization? Could you sum up the most important thing in one phrase?" Data were transcribed and coded for themes.

SECONDARY SOURCES USED TO ESTABLISH EXTERNAL ENVIRONMENTAL DESCRIPTION

A number of secondary sources were used to describe the external environment of the hospital during the time surrounding the study. In addition, field notes kept during the Demonstration Project at meetings with hospital staff when the data were shared were examined in interpreting the findings.

Published secondary sources included:

American Hospital Association (1989) *Hospital Statistics*. Chicago: American Hospital Association

Levine Associates (1988) *Summary analysis of critical care nurse supply and requirements*. Prepared for American Association of Critical-Care Nurses. Rockville, MD: Levine Associates, Inc.

State of Washington data book (1989). Olympia, WA: Office of Financial Management

Source book of health insurance data (1990). Washington, D.C.: Health Insurance Association of America.

Suburban Community Hospital archives of newspaper clippings: 1980-1990

Washington State health data book: Hospital profiles (1986). Olympia, WA: Department of Human and Health Services.

Washington State health data book: County residents health care cost and use (1986). Olympia, WA: Department of Human and Health Services.

APPENDIX 3
SUMMARY DEMOGRAPHIC DATA

Table 3A. Summary Demographic Data for Registered Nurse Respondents

	Time 1 (1986)	Time 2 (1987)	Time 3 (1990)
Overall Number of Respondents	42	43	45
Age (Years)			
Mean (S.D.)	38.6 (8.7)	38.6 (8.9)	41.6 (8.6)
Median	37.5	37	42
Range	25-58	20-60	27-62
Gender (N, %)			
Male	2 (4.8%)	1 (2.3%)	1 (2.2%)
Female	40 (95.2%)	42 (95.5%)	44 (97.8%)
Staff Nurse (N, %)	30 (71.4%)	33 (76.7%)	39 (84.8%)
Charge Nurse (N, %)	12 (28.6%)	10 (23.3%)	7 (15.2%)
Primary Unit Assigned			
ICU	20 (48.8%)	24 (55.8%)	25 (55.6%)
CCU	21 (51.2%)	19 (44.2%)	20 (44.4%)
Primary Shift Worked			
Days	10 (23.8%)	12 (27.3%)	14 (31.1%)
Evenings	11 (26.2%)	10 (22.7%)	12 (26.7%)
Nights	15 (35.7%)	12 (27.3%)	10 (22.2%)
Rotate	6 (14.3%)	10 (22.7%)	9 (20.0%)
Extent of Work			
Fulltime	10 (23.8%)	9 (20.5%)	6 (13.0%)
Partime	28 (66.7%)	25 (56.8%)	35 (76.1%)
On Call	4 (9.5%)	10 (22.7%)	5 (10.9%)
Highest Nursing Education			
Diploma in Nursing	18 (42.9%)	21 (47.7%)	16 (35.6%)
Associate Degree	12 (28.6%)	11 (25.0%)	11 (24.4%)
B.S.N	12 (28.6%)	12 (27.3%)	14 (31.1%)
Master in Nurs.	0	0	4 (8.9%)

	Time 1 (1986)	Time 2 (1987)	Time 3 (1990)
Overall Number of Respondents	42	43	45
Certification in Critical Care Nursing (CCRN)			
Yes	16 (39.1%)	20 (45.4%)	19 (42.2%)
No	25 (60.5%)	24 (54.6%)	26 (57.8%)
Years Experience in Nursing (Years)			
Mean (S.D.)	14.5 (8.1)	15.2 (8.5)	17.6 (8.7)
Median	12	12.5	15
Range	3-37	3-38	4-40
Years Experience in at Suburban Hospital (Years)			
Mean (S.D.)	6.9 (5.6)	7.3 (6.1)	7.3 (6.6)
Median	6	6.5	5
Range	0.5-26	0.5-26	0.5-29

Table 3B. Summary Data for Patients

	Time 1 (1986-87)	Time 2 (1990)
Number	192	188
Unit (N, %)		
ICU	99 (51.6%)	108 (57.4%)
CCU	93 (48.4%)	80 (42.6%)
Gender (N, %)		
Male	100 (52.1%)	103 (54.8%)
Female	91 (47.4%)	85 (45.2%)
Age (years)		
Mean (S.D.)	63.2 (15.4)	63.8 (14.7)
Median	68	66
Range	17-92	18-89
Race (N, %)		
White	179 (93.2%)	185 (98.4%)
Black	3 (1.6%)	0
Other	8 (4.2%)	3 (1.6%)
APACHE II		
Total Score		
Mean (S.D.)	12.9 (6.5)	13.7 (7.6)
Median	11.0	12.0
Range	0-33	1-36
Acute Physiology Subscore		
Mean (S.D.)	8.4 (5.7)	8.8 (6.1)
Median	7.0	7.0
Range	0-26	0-31
Age Points Subscore (maximum possible = 6)		
Mean (S.D.)	3.9	3.9 (2.02)
Median	5.0	5.0
Range	0-6	0-6

	Time 1 (1986-87)	Time 2 (1990)
Number	192	188
Chronic Health Points (maximum possible = 5)		
Mean (S.D.)	0.6 (1.6)	1.1 (2.1)
Median	0.0	0.0
Range	0-5	0-5
Primary Failing System (N,%)		
Cardiovascular	103 (53.6%)	96 (50.5%)
Respiratory	40 (20.8%)	33 (17.6%)
Gastrointestinal	22 (11.5%)	23 (12.2%)
Neurological	19 (9.9%)	26 (13.8%)
Metabolic	4 (2.1%)	3 (1.6%)
Renal	2 (1.0%)	7 (3.7%)
Hematologic	2 (1.0%)	1 (0.5%)
Diagnostic Category		
Precipitating Admission		
Coronary Art. Dis.	35 (18.2%)	41 (21.8%)
Myocardial Infarct.	20 (10.4%)	13 (6.9%)
Congest. Ht. Failure/Pulm. Ed.	16 (8.3%)	15 (8.0%)
Peripheral Vascular Disease (surgical)	10 (5.2%)	12 (6.4%)
Obstruction/Perforation	10 (5.2%)	11 (5.9%)
Bleeding	13 (6.8%)	10 (5.3%)
Neoplasm	12 (6.3%)	9 (4.8%)
Infection	11 (5.7%)	10 (5.3%)
Trauma	8 (4.2%)	7 (3.7%)
Drug Overdose	8 (4.2%)	8 (4.3%)
Septic Shock	7 (3.6%)	9 (4.8%)
Postoperative Resp. Support	6 (3.1%)	7 (3.7%)
Endstage Exacerbation		
of chronic dis.	6 (3.1%)	5 (2.7%)
Embolus	5 (2.6%)	5 (2.7%)
Hypertension	5 (2.6%)	2 (1.1%)
Rhythm Disturb.	5 (2.6%)	7 (3.7%)

	Time 1 (1986-87)	Time 2 (1990)
Number	192	188
Seizures	2 (1.0%)	2 (1.1%)
Electrolyte imbal.	3 (1.6%)	2 (1.1%)
Metabol. Coma	2 (1.0%)	1 (0.5%)
Pericardial Dis.	2 (1.0%)	0
Intracereb. Bld.	1 (0.5%)	1 (0.5%)
Neuromusc. Failure	1 (0.5%)	2 (1.1%)
Valvular Ht. Dis.	1 (0.5%)	1 (0.5%)
Cardiogen. Shock	1 (0.5%)	3 (1.6%)
Poisoning	1 (0.5%)	1 (0.5%)
Post Card. Arrest	1 (0.5%)	3 (1.6%)
Other	1 (0.5%)	1 (0.5%)
Surgery (N, %)		
None	138 (71.9%)	147 (78.2%)
Elective	32 (16.7%)	30 (16.0%)
Emergency	22 (11.5%)	11 (5.9%)
Admission from: (N, %)		
Emergency Room	101 (52.6%)	111 (59.0%)
Rec. Rm. or OR	50 (26.0%)	37 (19.7%)
Another Floor in Hospital	34 (17.7%)	32 (17.05)
Another Hospital	5 (2.6%)	6 (3.2%)

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