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CASE STUDY OF ORGANIZATIONAL UNCERTAINTY IN AN ACUTE CARE HOSPITAL

by

Louellen Michele Issel

A dissertation submitted in partial fulfillment
of the requirements of the degree of

Doctor of Philosophy

University of Washington

1991

Approved by _____
(Chairperson of Supervisory Committee)

Program Authorized to Offer Degree: School of Nursing

Date June 5, 1991

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Abstract

CASE STUDY OF ORGANIZATIONAL UNCERTAINTY IN AN ACUTE CARE HOSPITAL

by L. Michele Issel

Chairperson of the Supervisory Committee: Professor Sue Hegyvary
Department of Community Health Care Systems

The purpose of this exploratory, case study research was to describe uncertainty as experienced within and across various organizational components within an acute care hospital. Although uncertainty has been investigated at the boundaries of the organization, no research has gathered data from individuals throughout the organization. Nor has research focused on the ways uncertainty is experienced on a daily basis. From a synthesis of the organizational literature, a definition of organizational uncertainty was developed in which uncertainty had two dimensions, information insufficiency and situational needs for decisions or actions.

Data were collected from top administrative personnel, associate directors of nursing, nursing unit managers, staff registered nurses, and one physician (n=28). Each participant completed a Needs and Information Balance Questionnaire (NAIBQ), a Resource and Technology Balance Game, provided information about the organization, and participated in an interview. Interview questions elicited information regarding sources and effects of organizational uncertainty and strategies used to deal with uncertainty. Data analysis included qualitative analysis of interview transcripts, and descriptive statistical analysis of the NAIBQ. Major sources of organizational uncertainty were fluctuations in patient census and care requirements, personal limitations, surprises from internal interdependencies, lack of control over professional practice, and external pressures on the organization.

Strategies used to deal with the uncertainty included fostering open communication, living with it and taking proactive actions.

From the case, four themes concerning organizational uncertainty were identified, specifically related to a baseline level of uncertainty, unpredictability of patterns, interdependence among individuals and organizational components, and personal limitations. Within each theme the dimensions of information insufficiency and situational needs to make decisions or take actions were present. A set of hypotheses are proposed which link organizational uncertainty to components of the organization's internal and external environments, and processes used to deal with the uncertainty. The study augments and challenges some of the existing literature about organizational uncertainty, including the buffering of the technical core, the undesirability of uncertainty and the need for increased formalization of structures. Implications for administrative practice and for research are discussed.

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ACKNOWLEDGEMENTS

The author wishes to express deep appreciation to each Committee member, Dean Sue Hegyvary, and Professors Frances Marcus Lewis, Debbie Ward and Doug Conrad, for their guidance and assistance in the preparation of this manuscript. Their insights, enthusiasm, and collegial probing contributed greatly to quality of this work. A very special thank you goes to the participants who provided a glimpse into the realities of organizational life in a hospital. In addition, special thanks to friends and family for their support and encouragement.

Prepartation of this manuscript was supported in part by the Nursing Systems Training Grant, NR 07083, from the National Center for Nursing Reseach.

DEDICATION

To each member of all my families
who has supported and loved me
throughout this adventure.

CHAPTER I: ORGANIZATIONAL UNCERTAINTY IN HEALTH CARE ORGANIZATIONS

Various aspects of health care services contribute to the health and well-being of individuals (Blum, 1981), including factors such as health economics, clinical practice, and characteristics of the health care organization. The geographic location, quality of housekeeping or the environmental uncertainty experienced by personnel are a few of the diverse characteristics of health care organizations. However, virtually all characteristics of a health care organization have the potential to affect individuals providing care. The central focus of this report is organizational uncertainty and an exploration of its manifestations and perceived effects in an acute care hospital.

While many characteristics of health care organizations are important to care delivery, organizational uncertainty is particularly critical and relevant. Uncertainty is inherent in organizational environments (Thompson, 1967; Emery & Trist, 1965), and is a characteristic of services delivery (Mills, 1986), a component of nursing technology (Overton, Leatt & Schneck, 1977), and relevant to both health care organizational development (Tichy, 1982) and strategic planning (Luke & Begun, 1988). Uncertainty, as defined in organizational literature, is the perception of inadequate information, unknown or unpredictable outcomes, or unknown or unpredictable consequences of actions (Milliken, 1987; Jauch & Kraft, 1986; Duncan, 1972).

Based on these definitions, the empirical relevance of uncertainty to various organizational processes and outcomes has been demonstrated. Uncertainty has been shown to affect the relationship between coordination of work activities and organizational performance (Cheng, 1984). In other research, uncertainty was found to have different effects on the behavior of managers in different hierarchical

positions (Hannaway, 1985). These two research reports indicate the diverse pertinence of uncertainty.

The theoretical relevance of uncertainty in organizations began with Thompson (1967), who stated that the central problem for complex organizations was coping with uncertainty. Thompson suggested that, as open systems, complex organizations face uncertainty and indeterminacy, which detracts from the 'organization's rationality. Rationality, albeit bounded (March, 1978), is required for controlling vital aspects of the organization, particularly its technologies and strategies. Organizational decision making, behavior and processes are affected by the certitude of information upon which decisions are based. As an organizational phenomenon present in health service organizations, uncertainty deserves empirical and theoretical attention, since uncertainty has the potential to affect organizational outcomes and ultimately patient care outcomes.

Statement of the Problem

Our understanding of organizational uncertainty derives from consideration of organizations across various industries. However, little is known about the dimensions and manifestations of organizational uncertainty in health care settings. In addition, the ways in which organizational uncertainty varies and is manifested across the organization is poorly understood, and any understanding of the phenomenon is limited to the organizational subunit studied.

Studies of organizational uncertainty have not focused on the experience of uncertainty within the organizational context. A majority of studies have been developed based on *a priori* theoretical propositions, and have been quantitative in nature. Thus, only factors specified in theoretical discussions have been

investigated. However, the range and diversity of factors associated with uncertainty in the daily life of organizational members may be far greater than the factors in a parsimonious theory. An incomplete understanding of organizational uncertainty limits the potential responses of administrators, managers and practitioners to the uncertainty.

Uncertainty generally is thought of as having two origins, the resources and the technology of the organization (Thompson, 1967). Thompson said that resource uncertainty is the unreliability or unpredictability of manpower, financing, or reimbursement; technological uncertainty is the unreliability or unpredictability of means of affecting a change in the product, which in health services is the patient. Both resource and technological uncertainty are important to organizational decision making, particularly strategic planning and clinical processes. The effects of either resource or technological uncertainty in health care organizations on decision making or on health care outcomes have not been studied.

Although uncertainty was hypothesized to affect organizational structure and outcomes (Thompson, 1967), these possible effects of uncertainty remain unstudied in highly professional and bureaucratic organizations, such as health care organizations. The development and efficiency of models of care delivery, which are structural elements of the organization, may be affected by organizational uncertainty. Unfortunately, information is lacking on what aspects of organizational uncertainty are relevant to structure and to outcomes.

To understand organizational uncertainty and its potential effect on patient care outcomes requires that uncertainty be studied across and within different components which comprise the organization. Here hierarchical levels within the organization are considered one aspect of organizational components. The few studies in health services that have collected data from multiple organizational

levels examined physicians as the sole professional providing health services (Shortell, Wickizer & Wheeler, 1984; Flood & Scott, 1987). However, nursing care is provided on a continuous basis in health care settings, and thus is also an important professional service provided within a different organizational component. Few studies of nursing have simultaneously considered multiple layers of the organization, notable exceptions being Haussmann, Hegyvary and Newman (1976) and Georgopoulos (1986). In addition, nursing functions as a link between the internal and external environments of the organization. Thus, resource or technological uncertainty within the clinical component of the organization can affect components of the organization linked either directly or indirectly to nursing.

The ideological and hierarchical distance between administration and professional parts complicates the study of any organizational phenomenon and necessitates considering both administrative and clinical components and processes. Nonetheless, virtually no research has focused on the presence and characteristics of one phenomenon, such as uncertainty, across organizational components within health care agencies. Research that simultaneously studies multiple components of the organization is needed to understand the health care organization's influence on providing services, and ultimately on service results. The lack of studies of specific phenomenon present in health service organizations, the lack of descriptions of such phenomenon across organizational components, and the lack of attention to organizational uncertainty constitute a knowledge gap addressed by this research.

The Study Purposes

The purpose of this exploratory research was to describe the ways in which uncertainty may be evident within various components within acute care institutions

and ways in which uncertainty may contribute to service results. The research aims were to:

1) describe uncertainty in an acute care hospital, as evident in multiple components of the organization, specifically the components of administration, unit management, and nursing care;

2) describe the ways in which uncertainty in an acute care hospital affects decisions within each organizational component;

3) describe the ways in which those experiencing uncertainty in an acute care hospital respond to the uncertainty; and

4) contribute to theoretical development regarding organizational uncertainty in an acute care hospital.

Since the preponderance of direct clinical service is provided by nurses and a central task of the hospital is providing nursing care, nursing units and nursing unit managers were selected from a range of possible departments within the organization for inclusion in the study. Maternity and oncology patient care units and managers were chosen from numerous nursing units for inclusion in this study.

Significance

Studying uncertainty as an organizational phenomenon in acute care health institutions has significance in three areas: health services administration, clinical practice, and theory development.

Health Services Administration

Since administration ultimately is responsible for organizational outcomes, the usefulness of research on uncertainty is related to the ways in which that

information can be used to influence the organizational outcomes, either through changes in the work, the structure, or decision making processes. Organizational uncertainty may impact the work, structure and outcomes of the organization through an influence on decision making.

Research on uncertainty may lead to the identification of key indicators of the existence of uncertainty across different organizational components. An assessment of organizational uncertainty using these key indicators could influence administrators' decisions. Also, theoretical knowledge regarding organizational uncertainty may be important to administrators in making decisions regarding the restructuring of work units, or the use of alternative lines of communication. For example, the design and implementation of different models of care may be modified if the relationship between the design and uncertainty is better known. The study of organizational uncertainty provides information, such as possible effects of structure on uncertainty, or possible affects of uncertainty on service results.

The significance of understanding the relationships among uncertainty, structure and outcomes is more directly seen as the relationship between uncertainty and individual decision making. Administrators are in positions that require extensive data gathering and information dissemination as part of their decision making process. To gather the data, administrators must rely on others. Despite the fact that communication occurs across organizational components, in complex, professional bureaucratic organizations, administrative and technical or professional components may become isolated from each other (Meyer & Scott, 1983; Mintzberg, 1983). Research on organizational uncertainty that addresses this distance among organizational components provides key insights for the consideration of administrators.

Both resource and technological uncertainty are critical to the strategic planning of hospital administration. Most administrators are cognizant of the constant changes in the environment of the hospital. Managers and practitioners also are concerned with or influenced by the environmental changes and uncertainties. Research on organizational uncertainty provides administration with an understanding of the impact on other parts of the organization of the resource and technological uncertainty that they experience. With an awareness of the stress or strain experienced by organizational members as a result of the uncertainties, administrators may be able to take steps to reduce the uncertainty experienced throughout the organization, and in so doing, may reduce the stress or strain experienced throughout the organization. Ideally, decisions made with an expanded understanding of organizational uncertainty can have a positive effect on clinical practice and service outcomes.

Clinical Practice

The care delivery system, specifically nursing care, needs to be understood in the context of the organization. The relevance of the organization as a context for patient outcomes has been studied. Flood, Scott, Ewy and Forrest (1982) reported that hospital features, such as hospital expenditures, were more significant than individual surgeon practices in patient outcomes. Institutional norms and professional interactions within the organization have direct effects on practitioners and subsequent patient health outcomes (Bloom & Lewis, 1977; McCallum & Harrison, 1985). Interaction among professionals and coordination of care are related more to medical-surgical mortality than to the amount of specialized treatment (Knaus, et al., 1986). One interpretation of these findings is that the organization is a context for providing care and professional relationships that

influence patient outcomes.

These findings also confirm previous studies showing a relationship between the organization and the process of providing care (Haussmann, Hegyvary & Newman, 1976). Organizational uncertainty may be one characteristic of the organization that influences patient care delivery. Although some organizational phenomena have been studied in health care organizations, organizational uncertainty has not yet been studied for relevance to providing care, despite the fact that uncertainty is a characteristic of nursing units (Overton, Leatt & Schneck, 1977; Alexander & Randolph, 1985; Alexander & Bauerschmidt, 1987).

Clinical practice may change based on an understanding of the potential effects of uncertainty, particularly the effects of uncertainty on clinical decision making. The recent trend to focus on outcomes of care increases the importance of understanding the organizational context for care delivery, and the role of uncertainty in clinical decision making and in efficiency of clinical staff. While practitioners may know the areas in which they experience uncertainty, they may not have linked that awareness with their decision processes. Based on a conscious assessment of the uncertainties, changes may be made in individual decision making processes as well as in altering or minimizing sources of the uncertainty.

Also, knowledge concerning sources and manifestations of organizational uncertainty within different organizational components could be utilized in the development of nursing care delivery systems or models. To optimize the care delivery systems or models, specific structural or procedural elements might be modified in order to reduce the sources and manifestations of uncertainty.

Theory Development

Using a qualitative approach, factors related to organizational uncertainty may

be isolated and named. A factor-isolating theory (Diers, 1979) of organizational uncertainty then may be developed. In this way, the results contribute to general theory development regarding organizations, and more specifically, theory development applicable to health services and nursing administration theories.

Organizational theory generally has dependent variables that are in some way related to organizational efficiency, whereas nursing theories generally have dependent variables related to health status. By studying uncertainty as an organizational phenomenon in acute care settings, both organizational efficiency and health status may be of concern. Thus, any theoretical developments possible as a result of this study are applicable to organizational science, and more specifically, applicable to health services research and nursing science. Since this is a factor-isolating study, neither organizational efficiency nor health status are viewed as dependent variables. However, to the extent that participants relate these variables to uncertainty, they become part of the description of organizational uncertainty.

Development of theory regarding nursing administration recently has received increased attention (Schultz, 1990). Most theories of nursing administration have been adapted from organization theory. By considering the organizational context and the possible effects of uncertainty on clinical decision making, this study contributes to the theoretical base of nursing administration. In nursing administration, most research is typified by subjective knowledge, that is, of and for nursing (Kidd & Morrison, 1988). This study of organizational uncertainty goes beyond the search for subjective knowledge by considering a phenomenological paradigm using qualitative research (Kidd & Morrison, 1988). Qualitative nursing administration research focuses on both the immediate experience and the context of providing nursing services within an organization. By setting aside *a priori*

definitions and descriptions of organizational uncertainty, organizational uncertainty can be understood as an experience within the organization, and in relationship to the context of the organization.

Summary

Some evidence in health services research suggests that aspects of the organizational context may influence service delivery, and ultimately patient care outcomes. However, research is lacking that considers organizational uncertainty simultaneously as one element of the organizational context, and as an antecedent of service results. This proposed factor-isolating, naturalistic case study seeks to describe the manifestations of organizational uncertainty in acute care settings, and describe possible influences of organizational uncertainty on the service results for patients.

CHAPTER II: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

In this chapter a conceptual framework for studying organizational uncertainty is developed based on a review of existing literature regarding uncertainty. This chapter begins with a discussion of uncertainty in organizations as portrayed in the literature. A review of measures of organizational uncertainty reveals that measurement has been inadequate and limited. A definition and model of uncertainty then are proposed based on the notions of interpreting information and situational needs. Intra-organizational linkages among administration, managers, workers, and organizational input are included in the model. In the next section, possible manifestations and transmission of resource and technological uncertainty across organizational components in a health services organization are explored. The chapter concludes with a set of research questions addressed by this study.

Review of Literature Regarding Uncertainty

Uncertainty has long been a concern of organization theorists such as Thompson (1967), who stated that organizations must deal with uncertainty. External and internal boundaries of the organization are areas where organizational uncertainty is theorized to exist. Environmental uncertainty occurs between the organization and its task environment (Emery & Trist, 1965; Lawrence & Lorch, 1967; Pfeffer & Salancik, 1978), whereas technological uncertainty occurs between the material input into the organization and the work force (Thompson, 1967; Mills, 1986; Overton, Schneck & Leatt, 1978). Conceptualizations of environmental and technological uncertainty have emphasized inadequacies in information and interpretation (Jauch & Kraft, 1986; Milliken, 1987). The following sections discuss

various processes occurring within organizations and how they relate to uncertainty.

Information, Interpretation and Uncertainty

The extent to which uncertainty has been linked to the process of interpreting information is revealed in conceptual analyses of environmental uncertainty. In their review of the literature on uncertainty, Jauch and Kraft (1986) cited authors such as Emery and Trist (1965) as adhering to the classical view of environmental uncertainty, which holds that forces external to the organization have various characteristics, one of which is uncertainty. The information about the environment reflects the inherent uncertainty to which the organization must respond. They found Thompson (1967) to be of the transitional view; he suggested that environmental uncertainty had sources both external and internal to the organization, and that some control over uncertainty was possible and necessary. According to Jauch and Kraft (1986) the process view of environmental uncertainty is espoused by Duncan (1972), who maintains that uncertainty originates in an individual's perception. These different views of uncertainty highlight a diversity of opinion and definitions regarding the nature and source of uncertainty in organizations.

Conceptual development continued with Milliken (1987). Assuming uncertainty to be a perception and subject to interpretation, Milliken identified three types of uncertainty related to the environment of the organization: state, effect, and response uncertainty. State uncertainty was defined as an incomplete understanding or knowledge of the interrelationships among environmental elements, or lack of understanding of how components of the environment might be changing. Effect uncertainty was defined as the inability to predict the specific impact of either an environmental state or change on the organization. Lastly,

response uncertainty was defined as the lack of understanding of the available options and their utility. Response uncertainty is particularly important when there is a perceived need to act. Each type of uncertainty was based on information available for interpretation.

The information to be interpreted has characteristics that contribute to uncertainty. Characteristics of information important in determining uncertainty are diversity/homeogeniety, stability/change, and permanance/transience (Osborn et al., 1980). Diversity/ homeogeneity refers to the extent to which the data are in different forms or the data convey differ types of information. Diversity of information may contribute to the ambiguity or equivocality often associated with uncertainty (Putnam & Sorenson, 1982). Stability/change reflects the extent and direction in which the current information may be different from previous information.

Information also has a temporal characteristic. Permanence/transience denotes the extent to which the information is enduring, or the length of the period for which the information may be considered useful. Together these three characteristics of information influence interpretation, and thus influence the attribution of uncertainty to a situation. Nonetheless, determination of uncertainty is ultimately an individual interpretative process.

Three additional perspectives on uncertainty shed light on the nature of uncertainty in relationship to information and interpretation. In economics, uncertainty is distinguished from risk (Knight, 1927). Both uncertainty and risk concern knowledge about the future. Knight defined uncertainty in terms of the degree of "subjective confidence," whereas risk was measurable and expressed in probabilities. The organizational literature on uncertainty tends not to distinguish in this way between the subjective nature of uncertainty and the quantifiable nature of

risk.

Secondly, the principle of uncertainty in physics states that the more accurately one tries to measure the position of a particle, the less accurately one can measure its speed, and visa versa (Hawkings, 1988). The act of measuring either the position or the speed influences the position or the speed. If organizations are systems, then some corollary of this uncertainty principle may apply. In organizational and information processing terms, the more the organization or individual seeks information, the more likely that information is to change. The organizational literature on uncertainty fails to address the dynamic nature of organizational systems, and in so doing, ignores the interaction between organization and information. Focusing only on the individual's interpretation may be inadequate to understand uncertainty in organizations.

The third perspective is evident in the nursing literature. Mishel studied uncertainty in relationship to stress in illness (1981, 1983, 1984, 1990). Four factors comprised the perceptions of uncertainty: ambiguity, lack of clarity, lack of information, and unpredictability. Mishel suggested that uncertainty may have a role in supporting optimism, and that efforts to promote congruency between expectations and experiences altered the interpretation of uncertainty (1984a). Uncertainty is not a preferred state and is associated with loss of motivation, sadness, and poor expectations about the future. (1984b). While the populations for these studies were patients, individual interpretative and cognitive appraisal mechanisms may be relevant to staff and employees. In further theoretical developments, Mishel (1990) proposed that fluctuations in aspects of daily life and health are a source of uncertainty, and that by accepting the existence of such fluctuations, new ways of viewing the world can be developed and different actions can be taken to reduce the uncertainty.

Decisions, Actions and Uncertainty

The attention given to uncertainty stems from a concern for performance (Jauch & Kraft, 1986) and strategic planning (Milliken, 1987), both of which are based on decision making and actions. The organization is assumed to have the ability to isolate uncertainty and establish procedures for minimizing the uncertainty (Thompson, 1967). Also, focus is on the environment of the organization and the subsequent formation of strategy (Lawrence & Lorsch, 1967; Pfeffer & Salancik, 1978), rather than on the professional personnel of the organization and the effect on organizational output. Two key concepts are pertinent to the relationship between uncertainty and decision making: structure and rationality.

Structural aspects of the organization are developed to minimize the technological uncertainty. Thompson (1967) hypothesized that the technical core (the workers) needed to be "buffered" from the uncertainty inherent in both the environment and the various inputs into the organization. By developing operating rules such as centralization, formalization, and routinization, the uncertainty would be minimized and the work of the organization could continue efficiently. This hypothesis led researchers to investigate both technological uncertainty, and the relationship between technological uncertainty and organizational structures.

Uncertainty was defined as one of three dimensions of nursing technology in hospital nursing units (Overton, Schneck & Hazlett, 1977; Leatt & Schneck, 1981). They defined uncertainty as the degree of insufficient knowledge about the patient and the probability of achieving the intended outcomes of interventions (Leatt & Schneck, 1981). Uncertainty in these studies was a characteristic of the organizational input, i.e., patients, with which the technical core, i.e., nurses, must work. Subsequent research (Alexander & Bauerschmidt, 1987; Alexander &

Randolph, 1985) investigated the link in health care settings between uncertainty and organizational structural dimensions, specifically formalization, vertical participation, and horizontal participation. The degree of uncertainty was correlated with more rules and procedures (Alexander & Mark, 1990). Implicit in organizational activities designed to cope with uncertainty (Hinings et al., 1974; Lachman, 1989) is the need to minimize the variability of organizational activities influenced by uncertainty. From these studies three summary statements can be made: 1) technological uncertainty stems from the input to the organization, 2) work decisions are influenced by uncertainty, and 3) organizations develop systems for minimizing technological uncertainty.

However, research and theory development focused on organizational structure de-emphasizes individual workers' information processing, decision making capabilities and motivations. Individuals differ in regard to sources of motivation; some are motivated to action by situations involving uncertainty about the self and environment, others by situations involving certainty (Sorrentino, et al., 1988). Individuals who are motivated by both uncertainty and by certainty process information systematically and use heuristics (Sorrentino, et al., 1988). One limitation of this social psychological research is that decision making and motivations are free of any context or consequences.

In organizations, environmental and technological uncertainty influence both decision making and the decisions. Rationality, or the lack thereof, is important in the strategic planning and decision making regarding responses to environmental uncertainties facing the organization (Morgan, 1986; Simon, 1975). The design and implementation of the structural aspects of the work are based on an assumption of rationality (Thompson, 1967). Taking steps to buffer, protect or insulate the technical core from making complex decisions regarding their work, and from the

uncertainties in the organization's environment, are rational steps from the perspective of administration. While the assumption of rationality has been challenged (March, 1978), structural designs based on rational approaches to minimizing uncertainty remain.

Uncertainty as an Organizational Phenomenon

Uncertainty is based on interpretation of events and information. Interpretation is both an individual as well as organizational process, i.e., the "process of translating events and developing shared understanding and conceptual schemes among members" (Daft & Weick, 1984). For organizational interpretation to occur, cognitive schemes for interpretations and meanings need to be communicated throughout the organization. Through intra-organizational communication, particular data and events may be given the same interpretation throughout the organization, including an interpretation of uncertainty.

Organizational interpretation requires linkages among various departments and component layers of the organization, particularly among administrative, managerial and professional personnel. However, according to institutional theory (Meyer & Rowan, 1977; Meyer & Scott, 1983) those linkages become loose as the distance and disparity of the ideologies and concerns increases among administrative, managerial and professional personnel. In loosely coupled organizations, members from different organizational components perceive different information and have different cognitive interpretative schemes and situational needs (Weick, 1979). In professional bureacracies (Mintzberg, 1983) such as hospitals, the parallel structures of professionals and administration accentuate the loose coupling and the ideological distances. In fact, personnel from different organizational components do have different mechanisms for interpreting

information, and do have different situational needs (Danowski, 1988). From an organizational interpretative perspective, uncertainty may have the same meaning throughout the organization. However, loose coupling of professional organizations may counteract or limit the sharing of meanings and interpretations.

Research findings indicate that organizations from different industries experience uncertainty differently (Stinchcombe, 1990; Cameron, Myung & Whetten, 1987; Buntzman & Miller, 1990). Such findings support the notion of uncertainty as an organizational phenomenon, not just an individual interpretation.

Uncertainty in Health Service Organizations

In health service organizations, technological uncertainty originates within the organization at the level of the patient/client. Although the literature regarding the perspective of providing service (Mills, 1986; Czepiel, 1985; Norman, 1984) depicts the consumer as an organizational participant who brings with him an uncontrollable amount of uncertainty (Mills, 1986), the patient is considered the raw material input into the health care organization and the patient's characteristics interact with the health care treatment and influence which tasks are to be done. The patient also interacts with organizational members, making health services technology an interactive process (Chisholm & Ziegenfuss, 1986; Larsson & Bowen, 1989). Thus, technological uncertainty of service organizations results from patient characteristics and changes in the nature of the patient-provider relationship (Larsson & Bowen, 1989; Mills & Margulies, 1980).

Mills and Moberg (1982) proposed that service organizations respond to technological uncertainty through client selection, client socialization, and standardization of work. These organizational responses to the technological uncertainty of individual clients are similar to the organizational responses

identified by Lipsky (1980) and Roth (1971). Lipsky's "street level bureaucrats" actively practiced client selection by using a variety of techniques available in bureaucracies. Roth (1971) found that emergency room staff and practitioners also practiced client selection and routinization of work as a means to reduce the uncertainty of their tasks. In both studies, the decisions regarding client selection and treatment were based on information about the client. The information available to the health care professional is interpreted, and medical and nursing care decisions are made.

In health service organizations, the traditional notion of minimizing uncertainty or buffering the providers from uncertainty is questionable. Strauss and associates (1985) suggested that the uncertainty of health care technology may originate from multiple sources, related to contingencies inherent in the medical technology, the organization, and the patient. Although uncertainty has the potential to affect both work performance and problem-solving, the immediate and interdependent relationship between provider and patient needs to be taken into consideration in analyses of the effects of uncertainty within health service organizations.

Measurement of Uncertainty

The measurement of uncertainty is problem-laden. In studying organizations, Duncan (1972) found the degree of change in factors included in the decision process contributed more to uncertainty than did the number of factors taken into consideration in the decision. However, Downey, Hellriegel and Slocum (1975), in a careful replication of Duncan's study, refuted Duncan's results. Their results suggested that the number of factors considered and the degree of change might both be inversely related to the perception of uncertainty. Downey,

Hellriegel and Slocum's study highlighted the inadequacy of measures of uncertainty and the ambiguity in the conceptualization of uncertainty. Tosi, Aldag and Storey (1973), and Downey, Hellriegel and Slocum (1975,1977) all found previous measures marginally reliable and questionably valid. For example, Duncan's measure of perceived environmental uncertainty (Duncan, 1972) attained an alpha reliability coefficient of .67 (Downey, Hellreigel & Slocum, 1975). Since the mid-1970s no new measure of organizational uncertainty has been reported in the organizational literature.

More recent measures of environmental uncertainty (Milliken, 1987; Lachman, 1990) have continued to focus on uncertainty in relationship to the interpretation of information from and about the organization's environment, rather than perceptions or interpretations. Variables chosen as indicators of environmental uncertainty are inconsistent across studies, and are not reported as reliable scales.

Technological uncertainty in health and human services has been studied as different variables: the degree of routineness (Hage & Aiken, 1969; Glisson, 1978), the ability of the professional to manage or anticipate the work and the client (Mohr, 1971; Comstock & Scott, 1977; Verran & Reid, 1987), and the degree of problem solving required in carrying out the work (Glisson, 1978; Verran & Reid, 1987).

Summary of Review of Uncertainty Literature

Several shortcomings are evident in the content of studies of uncertainty. The studies have: 1) measured uncertainty as a concept with *a priori* dimensions and linear relationships with organizational variables, 2) considered uncertainty at organizational boundaries, rather than as a characteristic or process of

organizations, 3) tended to investigate uncertainty across different types of organizations, and 4) included only one or two levels of the organization in the study of uncertainty.

Fundamental to uncertainty is the notion that an individual perceives and interprets available data. Data originate from multiple sources, such as the patient or the environment of the organization, and may have different characteristics as discussed earlier. Data may appear as conflicting, ambiguous, or equivocal. The organizational member may respond to equivocal and ambiguous data by searching for additional data, or by drawing upon past interpretations and available cognitive structures. The process by which data are given meaning and carried out by organizations, as well as by individual organizational members, is a process of interpretation.

Uncertainty as portrayed in the literature has two key dimensions: information and decision making/action. Information has characteristics that influence its interpretation. Information or available data are perceived as being sufficient or insufficient (i.e., missing or ambiguous). However, the usefulness of information is implicit in the perceived need to make decisions or take action (i.e., strategic planning or formalizing work).

Environmental uncertainty occurs at the external boundary of the organization and is concerned with resources. Technological uncertainty occurs at the internal boundary, particularly of service organizations, and is concerned with doing the work of the organization. The possibility exists for uncertainty to be an organizational phenomenon given communication among organizational members from different organizational components. Finally, the service aspect amplifies the technological uncertainty in health care organizations, and the professional status of health providers complicates buffering the professional from either resource or

technological uncertainties.

Framework for Studying Uncertainty In Hospitals

Given the diversity of approaches possible in the study of organizational uncertainty, a conceptual framework was needed to guide the formulation of this research. A definition of uncertainty was developed based on a synthesis of the literature about uncertainty. Next, a model of the way in which uncertainty becomes an organizational phenomenon was developed based on the definition. Using the model as guide, both resource and technological uncertainty are discussed in relationship to organizational members from administrative, managerial and clinicial components of the organization.

Uncertainty Defined by Two Dimensions

To guide this research, uncertainty was defined as a characteristic attributed to a situation circumscribed by objective data, in which the data are deemed to be insufficient or indeterminate to some extent for the current needs of the situation. Both the information insufficiency and the situational needs are dimensions of organizational uncertainty in this definition. Figure 2.1 shows the two dimensions, information insufficiency and situational needs, as continua that interact to generate degrees of organizational uncertainty.

Information will be interpreted in light of these expected needs for decisions or actions related to the work. Each situation experienced by the organizational member causes different degrees of need to make decisions or take action, depending upon the urgency, the importance of particular desired outcomes,

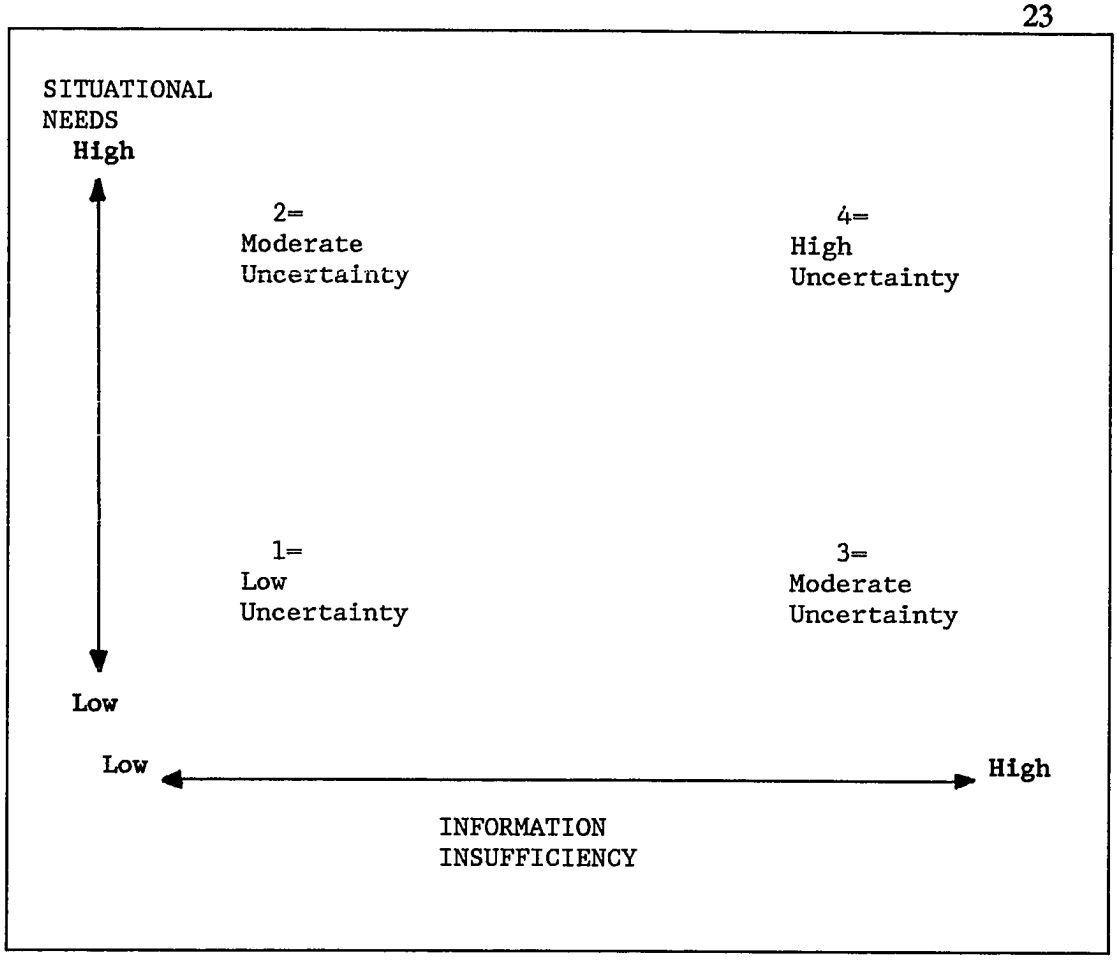

Figure 2.1. Degree of Organizational Uncertainty as a Result of the Imbalance Between Information Sufficiency and Situational Needs

rapidity of expected reactions, and such. These characteristics of situational needs are evaluated against the quality of the data. In situations in which the data do not provide sufficient information for situational action needs, uncertainty is present for the individual.

The degree of imbalance between the insufficiency of the information and the situational needs determine the level of uncertainty. As indicated in Figure 2.1, the lowest uncertainty (quadrant 1) occurs in situations in which the information are least insufficient, in other words, data are relatively sufficient, concrete, unequivocal

and precise, and there was minimal need in the situation for making decisions or taking action. The highest uncertainty (quadrant 4) occurs in situations in which information was highly insufficient by being equivocal, lacking or ambiguous, and there was a high need in the situation for making decisions or taking action. Moderate uncertainty exists if the information insufficiency is lower than the action needs (quadrant 2), or the action needs are lower than the information insufficiency (quadrant 3).

Once a situation has been interpreted as uncertain, several responses are possible. The individual may re-evaluate the desired outcomes, the information, or the situational needs. The observable outcomes of the uncertainty in an organization are either communication in the form of memos, conversations, or inquiries, or behavioral acts related to performing work.

Resource and Technological Uncertainty

Data to be interpreted may be classified as information regarding either organizational resources or organizational technology. Likewise, situational needs can be classified as pertaining to either organizational resources or technological needs. While the two sources of data are similar to Thompson's (1967) environmental and technological uncertainty, the terms used here are intended to be specific to health care organizations. The term "resource" rather than "environmental" is used since technological uncertainty also stems from the environment, albeit the environment internal to the organization. Also, the acquisition and management of resources are underlying reasons for the concern with the external environment. Using the term "resource uncertainty" thus more accurately reflects the fundamental domain of concern and information, and eliminates confusion about the term "environment." Both resources and

technological data encompass relevant data to be processed by individuals or organizational groups.

Resource uncertainty originates at the boundary between the task environment of the organization and the administrative component. Resource uncertainty is characterized by insufficient or indeterminate data for the resource action needs of the situation. Resource information and resource needs of health care organizations pertain primarily to fiscal and personnel resources. Data related to organizational resources, such as finances, personnel, and the market or population, are important to resource uncertainty. For example, full and complete knowledge of the health care market and reimbursement is needed to improve administrative decision making, planning, and subsequent fiscal soundness of the organization. Resource uncertainty can be experienced at all components of the organization to the extent that some situation involves both resource data and decisions.

In health care organizations, technological uncertainty refers to the patient or consumer and the evaluation of the available information regarding medical technology, care options, and the situational needs. Data related to scientific knowledge and the individual patient are important to technological uncertainty. Technology uncertainty is characterized by insufficient or indeterminate data for the technological needs of the situation. Technological uncertainty may originate from data or needs pertaining to medical technology, organizational factors, or the patient. The importance of uncertainty in health services is highlighted by the extent to which the health professional must interpret insufficient information for clinical decisions regarding subsequent clinical actions. However, members from other organizational layers also must make decisions regarding technology and services, and thus also experience technological uncertainty.

Uncertainty Throughout the Organization

Resource and technological uncertainty are present throughout the organization. Thus, organizational uncertainty is one phenomenon of health care organizations that may have an influence on service results within the patient component.

The environment of the organization directly influences administrators, unit managers, and clinicians. Administrative personnel influence and communicate with unit managers and clinicians. The unit managers influence clinicians, and thus the services provided. Clinicians then influence the service results, qua patient outcome. In addition, administrative personnel indirectly affect the service results through effects on unit managers and on clinicians. The interaction, interdependence, and directionality of the relationships among environment, administrative personnel, unit managers, clinicians, and patients suggest that some organizational phenomena might be evident within each component, including uncertainty. While the relationships among members from different organizational components represent typical organizational relationships, the imbalance between information and needs that can affect other organizational members.

Within each component of the organization, the balance between data insufficiency and situational needs is continuously determined for both resources and technological situations. Therefore, redundancy occurs throughout the organization because of each individual's interpretative process.

Members from different organizational components interpret data in relationship to their work needs such that they attribute uncertainty to the situation. Administrative personnel receive data about the environment external to the organization and are concerned with the myths and the legitimization of the organization. Professional personnel receive data about the environment internal to

the organization, namely patients, and are concerned with the myths and legitimization of the work of providing health care. As a result of their differences, administrative and professional personnel are hypothesized to become decentralized and loosely coupled in order that each carry out their societal responsibilities (Meyer & Scott, 1983). Difficulty in exchanging information across the loose organizational linkages may result in insufficient or indeterminate information for the situational needs of any one organizational component. Thus, loose coupling of organizational components may increase the uncertainty experienced at different organizational components. Also as a consequence of loose coupling, uncertainty may have different sources and manifestations at different components of the organization.

Uncertainty in the Administrative Component. Administrators must be responsive to a multitude of sources of resource and technological uncertainty in the organization's environment. According to institutional theory (Meyer & Scott, 1983), administrators use data from the environment and focus on actions in accordance with the social norms of the organization's environment. The imbalance between information insufficiency and situational needs will be influenced by these norms. Thus, both resource and technological uncertainty for administrative personnel will be relative to the actions expected by those setting the norms, specifically, the governing body, competition, peers and consumers.

Administrative personnel are responsible for interpreting data from the environment (e.g., federal regulations, marketing surveys) for the purpose of making strategic decisions designed to assure the inflow of revenues and control of costs. (e.g., Ulrich & Weirsema, 1989). State and federal regulations, statutes and policies, political actors, and a variety of players are all relevant to resources of the

organization. Resource uncertainty for administrators can be expected to be related to those factors and actors in the environment that provide resource data or require decision making. The interpretation of resource uncertainty is communicated by administrators to managers, and indirectly to the clinicians through the managers.

Technological uncertainty for administrators primarily is related to medical technology trends and population needs. Personnel skill and availability, professional norms, community morbidity and mortality, socioeconomic welfare of the community and medical technology trends are also relevant to the technology of the organization. These and other factors provide information and create conditions requiring decisions or actions. One important source of technological uncertainty is the patient population base of the organization. The selection of clients based on a need for similarity of work activities begins at the administrative layer by means of strategic decisions regarding markets and services. Administrative personnel may attempt to restore the balance to technological information and situational needs by making decisions regarding acceptance of payors and types of available services.

Uncertainty in the Managerial Component. While administrators are more concerned with program implementation, managers are more concerned with the implementation of direct services. Managers must interpret information originating from patients and clinicians as well as from the administration. Although Thompson (1967) hypothesized that managers mediate the environmental and technological uncertainty, virtually no research exists to support or refute his hypothesis. The work unit is the place where the work gets done, and where those doing the work interface with those overseeing the work to be done. Research exists that addresses the relationship between the managers, workers and performance

(e.g., McClosky & McCain, 1988), and between the structure of the work unit and performance (e.g., Alexander & Bauerschmidt, 1987; Miller, 1987). Differences in the dominance of technological characteristics among nursing units suggest that technological uncertainty is not uniform across work units (Alexander & Bauerschmidt, 1987; Alexander & Randolph, 1985; Overton, Schneck & Hazlett,1977).

Differences exist among patient groups receiving care on different units, and differences exists in health care technology for those patient groups. The work unit, as a functional unit, needs to be able to respond to the biological, emotional and cultural responses of those patients to their illness and hospitalization experience. Managers are responsible for integrating the uniqueness of the patient services on their unit with the overall hospital services. However, unit managers receive data and action requests from other organizational components that increase both the data and the situational needs that may lead to organizational uncertainty.

The work unit, the area of responsibility of managers, is the smallest organizational unit at which behaviors are reinforced. Within the unit component, small communication loops among unit members, and loose coupling between the work unit and the administration can contribute to the imbalance between data and needs unique to that work unit. Unless the work unit has new members and receives feedback from the administration, the same criteria for balance will be used. Additionally, unit managers' interpretation of both resource and technological data is communicated to individual clinicians. The clinician is likely to make similar interpretations of the same or similar data.

One type of organizational uncertainty that managers experience is resource uncertainty. Resource information available to unit managers is often concerned with personnel and fiscal resources for the unit. The parameters of the unit's budget

are communicated to the manager from the administration. Resource situational needs are also present for managers in the form of budgetary decisions, extension or elimination of service decision, and staffing decisions. Managers also have access to information from physicians (MDs) and registered nurses (RNs). The clinicians on the unit provide resource information primarily in the form of specialized knowledge and experience. That is, there is a collective scientific knowledge base from which the clinicians derive shared interpretations and, as an aggregate, provide specialized information to the organization related to the particular patient group being served.

Technological uncertainty for managers stems from an imbalance between the data and needs regarding the technology of the unit. Information of concern to managers includes the institution-wide policies aimed at standardizing the interpretation and actions related to patients and personnel. Information about technology available to the manager include data such as the number of patients on the unit, level of acuity on the unit, and the types of equipment necessary to meets the needs of patients. These data are gathered over time. The manager also receives information from individuals. Individual patients and individual professionals may vary from the aggregate sufficiently to be noticed by the manager. Deviations from the aggregate reflect an imbalance between information and situational needs that results in technological uncertainty.

Uncertainty in the Direct Service Provider Component. Professional clinicians, specifically MDs and RNs, provide direct care and experience organizational uncertainty. Administrative personnel and unit managers influence the availability of resource and the technological information and the situational needs. In addition, each clinician is concerned with patient data and situational

needs. Administrative, managerial and patient factors affect the clinician's evaluation of the imbalance between information and situational needs. The resources and technological data available to clinicians are different from the data available to either managers or administrative personnel. Because of the loose connections between clinicians and members from other organizational components, the information and situational needs of the provider will be different from other organization members.

Resource uncertainty for clinicians is likely to be related either to personnel or to medical equipment necessary for providing the health care. For example, if a medical procedure is required (a situational need) but the provider lacks sufficient information regarding the availability of the medical equipment or the possibility of accessing the equipment from other institutions (data quality), resource uncertainty is present. Such types of resource uncertainty are likely to be of limited duration.

In contrast, resource uncertainty related to personnel may have a much longer time frame and be an ongoing uncertainty. Working as a team with other health professionals is not only a competency (Benner, 1984), but also a necessity. Technology of the professionals and subsequent service results are dependent upon the use of information, data, and diagnostics. The extent to which the organization has mechanisms in place through which such information can flow becomes critical to the work of the professionals. Coordination between the direct service professionals and support or ancillary personnel can be a personnel resource area of uncertainty.

The preponderance of data clinicians receive is related to the technology of the unit. The clinician simultaneously must interpret data concerning acceptable unit procedures, standards and policies, and individual patient data. Each of these influences the information for the interpretation and subsequent uncertainty.

Standardization, for example, reduces the information needed for planning and delivering nursing care but does not address or alter the situational needs. Services provided by clinicians must be individualized (customized) to achieve the desired service results, but in order to do so, flexibility of rules and procedures is required. Administration and managers set service and organizational parameters for clinicians. Clinicians make decisions based on knowledge of the work unit expectations, norms, procedures, and policies. These work unit factors are components of the situational need and thus influence the determination of uncertainty. Characteristics of the work unit are interpreted and delivery of care is based on the interpretation. The situational needs may alter the interpretation of this type of work unit data.

Thus, the clinician becomes a mediating element between the manager and patient, and such a role has the potential to influence service results. The amount and type of patient data used as part of providing care is likely to reflect the degree of technological uncertainty, and efforts are made by nurses to reduce that uncertainty in order to maximize health outcomes.

As a provider with direct interaction with individual patients, the RN is responsible for interpreting patient data. Due to the nature of "being a patient," patient information often is the most transient, least stable, and most diverse. Patients can have at least three types of responses to the organizational context. A physiologic response to the stress of the being a patient may lead to psychoneuroendrocine stress responses (Frankenhauser, 1980). A psychologic response may be a coping mechanism with associated behaviors (Lazarus & Folkman, 1984). The third response may be conscious decision making, which is the basic self-determining mechanism through which the individual affects the organization. The total effect of the three possible patient responses is to increase

the diversity and transient characteristics of the information related to the required technology and to the determination of situational needs. Thus, the potential for an imbalance between data insufficiency and needs increases the technological uncertainty.

While the degree of stability and predictability of patient response are actually characteristics of the patient, estimating the degree of stability and predictability is an aspect of clinical judgment necessary for clinical actions. Assessing the patient is based on the perceptual and cognitive skills of the health professional. Uncertainty is a phenomenon experienced by each clinician because information is insufficient, ambiguous or imprecise compared to the need for clinical action.

Anspach (1987) suggested that clinicians use three types of information in making clinical decisions and judgments: technical cues available through diagnostics, perceptual cues available as information from patient observation, and interactive cues acquired through social interaction with the patient. Although clinicians have cognitive structures to facilitate the interpretation of patient data, the situational needs play a major role in the extent to which the data is insufficient for current needs.

Research Questions

Resource and technological uncertainty across the organizational components of administrative personnel, managers of the work unit, and nurses as clinical professionals have the potential to affect the results of services provided to patients. Although the proposed framework described above is derived from various empirical studies and diverse theoretical knowledge, no studies exist that

describe organizational uncertainty as it is actually evidenced within multiple components of the acute care hospital. Nor is there empirical knowledge regarding the ways in which organizational uncertainty contributes to service results.

The relationships among organization components and service results raise the following set of research questions:

1) In what ways are resource and technological uncertainty at the administrative component evident, and by what processes do resource and technological uncertainty in the administrative component influence the work unit component, direct service providers and service results?

2) In what ways are resource and technological uncertainty in the work unit component evident, and by what processes do resource and technological uncertainty at the work unit layer influence direct service providers and service results?

3) In what ways are resource and technological uncertainty at the direct provider component evident, and by what processes do resource and technological uncertainty at the direct provider component influence service results?

These questions were addressed in the project reported in subsequent chapters.

Summary

Based on review of the organizational literature, uncertainty was defined as an attributed characteristic given to a situation or phenomenon defined by objective data, in which the data are deemed to be insufficient or indeterminate, to some extent, for the current needs of the situation. Uncertainty encompasses two major areas, resources and technology, in which data and situational needs may be

imbalanced. Both resource and technological uncertainty are present at the administrative, managerial, and direct service provider components of the acute care organization. Resource and technological uncertainty in each organizational component have the potential to influence service results at the patient component. Although the conceptual framework describes possible relationships between data and situational needs, and possible manifestations of uncertainty at the various organizational layers, empirical knowledge of organizational uncertainty and its possible effects on service results is lacking. The research design and methods for investigating organizational uncertainty are detailed in the following chapter.

CHAPTER III: METHODOLOGY

In this chapter, the research design, specifically the case study design, is discussed. The case study design was chosen to measure in real organizational terms, that is, to measure "things that really happen in organizations, as they experience them." (Mintzberg, 1979:586) Following the discussion of the design, the sample and sample selection is discussed. Then, the research instruments are presented and the procedures are explicated. The chapter concludes with a discussion of human subjects.

Research Design

The aims of this research are to describe organizational uncertainty as evident within multiple components of the acute care hospital, to describe the ways in which uncertainty affects decisions, and to describe the responses to uncertainty. To achieve these aims, a design was required that enabled an exploration of the phenomenon in a naturalistic manner. The case study design was selected because it provides the flexibility necessary for such an exploration of organizational uncertainty. The case study approach is also useful for the simultaneous study of multiple dimensions and multiple levels of analysis (Schultz & Kerr, 1986). Another aim of this research is to contribute to theory development. Through application of a case study design, constructs and theoretical models can be developed (Yin, 1984). In short, the case study design is appropriate for the aims of describing the phenomenon and of contributing to theory development.

Case Study Design

Yin (1984, 1988) provided detailed information about case study designs, and

the following discussion is largely based on his work. Case studies are appropriate when decisions or processes are the major focus, the research focuses on current events, and no control over behavior is required. Those criteria are consistent with this research; the major focus is on organizational and technological processes as they occur, and no control over care delivery or organizational behavior is required. "A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used" (p.23).

The study of organizational uncertainty is certainly a contemporary phenomenon in a real-life context of acute care hospitals. The boundary between the organizational uncertainty and the broader context of other organizational factors is not clear. Finally, multiple sources of information are needed to gain a full picture of organizational uncertainty, service results and organizational processes.

The case design used in this study was an embedded, single-case design. An embedded case design focuses on the unit of analysis within the context of other units of analysis, and the unit of analysis has multiple subunits. This study had an embedded design in that the hospital was the unit of analysis within the economic and policy context, and subunits of interest included work units and care providers. A single-case design is appropriate if a case can be identified that is unique, or represents a critical aspect of the phenomenon (Yin, 1984). One hospital was identified as undergoing major changes and thus represented the critical aspect of uncertainty, therefore a single-hospital case study was chosen.

Embedded single-case study design has two major advantages over other designs. First, the breadth of data gained from multiple levels within the case increases the possibility of identifying patterns and responses, compared to

gathering data from only one level. The second advantage of the embedded single-case is that, as a pilot study, the single-case study is more economical than multiple case studies.

As with any design, the case-study design has implications for reliability and validity. Overall, to increase validity and reliability three principles of data collection were implemented: multiple sources of evidence were used, a case study data base was created, and a chain of evidence was maintained. Specific strategies were also implemented to address specific threats to reliability and validity.

The major threat to reliability in case study design is the lack of reproducibility. Yin (1984) suggested that reliability could be achieved by either of two methods: development, documentation and use of study protocols, or development of a study data base. In this study, reliability was maintained primarily through the development, documentation and use of data collection protocols. The data collection protocols are outlined in the methods section below. In addition, reliability of results within the embedded case design can be enhanced by obtaining both literal (similar information) and theoretical (contradicting information) replication. Thus, two nursing work units were selected for their ability to provide similar information on organizational characteristics, but also provide contrasting information on resource and technological uncertainty.

Internal validity, the ability to make unambiguous inferences or conclusions (Yin, 1984; Woods & Catanzaro, 1987), is related to factors that also could account for case study results. Potential threats to internal validity in the single case study design include changes in the data collection instruments, the effects of testing, sampling bias, and loss of participants from the study. Procedural steps must be taken to mitigate the effects of these potential threats. Internal validity is enhanced in a single case design by pattern matching, building explanations or conducting

time series analysis. Both pattern matching and building explanations were used in the analysis of the case data and are reported in Chapter VI.

External validity, the ability to generalize findings, is another issue inherent in case study designs. The dominant mode of assessing external validity in survey research is through statistical analysis, which assumes a random sample, and statistical generalization. Since the case study design does not use a sample representative of a population, statistical generalizations are not appropriate. Instead, external validity of case studies is based on analytic generalizations in which generalizations are made about the theory derived from the case analyses. Replication of case studies is used to support analytic generalizations. Construct validity, although problematic in case study research, can be increased by using multiple sources of evidence, establishing a chain of evidence and having key informants review the case study report. Each of these techniques to increase construct validity was employed during data collection.

A major methodological and statistical concern in many organizational studies reviewed has been the reconciliation of different organizational levels for inclusion in analysis. In most organizational studies, wide variation exists in whether representatives from one or more levels within the organization are included. For example in the measurement of technology, Mohr (1971) and Comstock and Scott (1977) used data collected from individual workers, supervisors and managers, whereas Glisson (1978), and Provan (1984) collected data from only one level of personnel. The statistical analysis of data collected from different levels within the organization, if aggregated, may hide effects at each level and for individuals. The comparative case study design utilizes data from the different levels within the case and does not aggregate the data across levels. In this way the case study prevents ecological fallacy, and the unique contributions of each level within the case

(hospital, work unit, and nurse) are interpreted as a pattern within the case.

To achieve the best possible case completeness, two work units of the same type were chosen for inclusion in the study as the relevant case sub-unit. By selecting one type of work unit as a sub-unit, the basis of comparison in the case studies is limited to only those factors influencing one set of corresponding service results. Essentially, a nested sampling technique was employed. From within the hospital as a case, a subsample of two work units was selected, and then within the work unit further subsamples of nurses were selected. By collecting data from each nested component of the organization, a total case picture is presented. The specific work units selected for this study were the maternity and oncology nursing work units.

Framework for Interpretation

Since the data collected included interviews and written records such as memoranda, the framework for analyses and interpretation of these diverse sources of data is important. Reflected in current discussions of research methodology (Morgan, 1983) is an underlying acceptance of a variety of diverse approaches to research and scientific inquiry. The case study approach used in this study embraced and utilized various aspects of qualitative and quantitative approaches. To understand organizational uncertainty from the perspective of different organizational members, a modified ethnographic approach was used to analyze interviews and observations (Lincoln & Guba, 1985; Spradley, 1980; Krippendorf, 1979). To understand the relative importance of information and the needs to make decisions, a quantitative analysis of self-report survey data was used. To synthesize the results of these different analyses, triangulation was used (Jick, 1979). From the overall results that depict different aspects of organizational uncertainty at different

components of the organization, theory refinement and development can occur and is presented in Chapter VI.

Methods

In this section definitions used to maintian consistency throughout the study are given, followed by discussions of the sample and data collection instruements.

Definitions

For the purposes of enhancing clarity and consistency, definitions were developed for hospital, work unit, nursing care, and uncertainty. The hospital was defined as an institution legally recognized as providing inpatient services, including maternity and oncology services. The work unit was defined as the functional group responsible for providing nursing care to maternity or oncology patients. The head nurse, nursing and support staff, the physical space, patient beds, and medical staff are included as elements of the work unit. Nursing care was defined as the actions and interventions implemented as direct patient care by registered nursing personnel, based on either nursing or medical orders, and intended to change health status.

Uncertainty is an attributed characteristic given to a situation or phenomenon defined by objective data, in which the data are deemed to be insufficient or indeterminate, to some extent, for the current needs of the situation. Organizational resource uncertainty is an imbalance between the sufficiency or determinacy of resources data and resources-related situational action needs. Organizational technological uncertainty is an imbalance between the sufficiency or determinacy of technological data and technology-related situational needs.

Characteristics of both resources and technological data and needs were measured.

Sample

Description and Selection. One organization in a metropolitan area in the Pacific Northwest was selected. Selection of the organization was based on the criteria of representing a unique and critical aspect of organizational uncertainty. Thus, the organization was selected for being in the process of developing a new response to its competitive environment, implementing internal changes for nursing units, and experiencing physician turnover. The organization is a community, non-profit organization that includes acute care and outpatient services.

From the administrative component, a purposive sample of three vice-presidents were asked to participate. Individuals in positions such as Director of Nursing, Vice-President of Operations, Vice-President of Finance, or Chief Executive Officer were invited to participate. Administrative personnel were eligible if they had been in their current positions for at least six months.

The maternity and oncology units were selected as the work unit component for several reasons. First, both units have a relatively low unpredictability of patients as compared with other hospital work units (Alexander & Randolph, 1984; Alexander & Bauerschmidt, 1987; Leavit & Schneck, 1981; Overton et al., 1977). Second, maternity and oncology care vary in the degree of standardization, although both specialities have standards of care specified by both medical and nursing speciality organizations. With set standards of care, variations in the delivery of nursing care must then be explained by other factors, such as organizational, work unit, or individual provider factors. Third, the intensity or acuity of care varies with these work units. The variations across and within units add further information about organizational uncertainty.

The nurse managers at each unit and all clinical nurse specialists (CNS) on the units were asked to participate in the study. To be eligible, the nurse manager or CNS must have been a registered nurse and have held the position for least six months. A convenience sample of staff registered nurses on the maternity and oncology units were invited to participate in study. To be eligible for inclusion, the staff registered nurses must not have had any management responsibilities in their current positions, and must have been employed on the unit for at least six months. A purposive sample of physicians from each unit were invited to participate. To be eligible, the physician must not have been practicing at more than one hospital, and must have been on staff at the hospital for at least six months. Of five physicians invited, only one physician consented to participate. The other four declined due to not being interested in participating or did not meet the criteria for inclusion regarding the minimun length of employment at the hospital.

Sample Size. Determination of the sample size of individuals is based on the ability to make meaningful interpretations of data and to have a comprehensive collection of relevant information. In a case study design, a power analysis to determine the number of participants required for statistical significance is inappropriate since variables measured were not intended for tests of statistical significance, nor were generalizations to a population intended. The number of components included in the study was limited by the available resources for data collection and willingness of individuals from different components to participate.

The determination of the number of data points needed was based on the ability to make comparisons. The number of individuals from whom data were collected was estimated based on the need to have corroboration of data, i.e., at least three informants per organizational component, and comprehensive data, i.e., informants from at least three components of the organization.

Measurement and Instruments

The embedded single-case design requires collection of data from multiple sources within the cases using multiple methods, and from multiple organizational components. In the administrative component, case data included interviews with administrative personnel, participant observations of meetings, questionnaires regarding the organization, and self-report questionnaires. In the managerial component, case data included interviews with nurse managers, participant observations of meetings, questionnaires regarding the nursing unit, records reviews, and self-report questionnaires. In the provider component, case data included interviews with registered nurses and one physician, participant observations of meetings, and a self-report questionnaire. Information from each source provides data on different aspects of organizational uncertainty and service delivery. Thus, different types of case data were collected from a variety of sources. Each type of case data provided information regarding an aspect of organizational uncertainty. A summary of the types of case data collected with the corresponding data sources and the information gained from the specific types of data is presented in Table 3.1. A summary of the different data collection forms used (Appendices A through O) and the variables measured is presented in Table 3.2.

Interviews. A semi-structured interview (Appendix A) was developed to be administered to the administrative personnel, the nursing unit managers, the unit staff RNs, and the physician. The questions were designed to elicit information regarding the interviewee's perception of the resources and technology data and needs, and their interpretations of the balance. The interview questions were pretested and reviewed for face and content validity by three experts in the areas of health care administration and nursing management. Based on their comments and

Table 3.1. Summary of Types of Case Study Data, Sources of Case Data and Information to be Gained

TYPE OF DATA	SOURCES OF DATA	INFORMATION TO BE GAINED
Interviews	Administrators, Managers, Staff RNs & Physician	Perception of technological and resource needs and data
Observation	Researcher at scheduled meetings	Decision-making under uncertainty, communication
Records Audits	Memos, Reports	Communication and behavior
Organizational Data	Key Informants	Characteristic of technology and resources data and needs, and organizational characteristics
Self-Report Survey	Personnel	Perception of organization and communication

suggestions, a final interview was developed.

The interview had three sets of questions, each designed to elicit different information. The first set of questions asked the participants to define and describe uncertainty in their positions, to describe how uncertainty affected their decisions, and to explain what they did in response to the uncertainty. The second set of questions focused specifically on decisions regarding resources and technology, and different aspects of those decisions. The third set of questions was intended to gain information regarding the organization. Questions referred to committees which had been established, the community influences on the organization or work unit, difficulties in providing care, and communication patterns among different groups within the institution.

Self-Report Survey. The Needs and Information Balance Questionnaire

Table 3.2. Summary of Descriptive Data Collection Forms, Sources of Data and Variables Measured.

DATA COLLECTION FORM	SOURCE OF DATA	VARIABLES MEASURED
Interview	Participants	Perceptions of resource and technological uncertainty, definitions of uncertainty
R & T Game	Participants	Degree of uncertainty for 20 resource and technological items
Field Notes	Researcher	Observations of communication and behavior
Communication Forms I, II	Memos, Reports	Communication, Resource or technological data or needs
Community Description	Census, State Health Data	Population and local health services characteristics
Hospital Description Forms I, II, III	CEO, CFO VP Nursing	Resource and technological data/needs of administrative component
Nursing Unit Description Forms	Unit Manager, Assist. Manager, CNS	Description of unit, resource and technological data/neds of managerial component
Clinician Form I	RNs	Resource and technological data/needs of the clinician component
NAIB Questionnaire	All Participants	Perception of communication, uncertainty

(NAIBQ) consists of self-report data concerning sufficiency of information, areas of decision making, communication between different groups, and perceptions of performance (Appendix B). The NAIBQ was given to each participant. The degree of sufficiency of information about different topics was assessed, using a Likert scale

ranging from 1 (completely sufficient) to 5 (not at all sufficient). The extent of communication between different groups within the hospital was measured, also using a Likert scale. Two questions asked specifically about the sufficiency of information received from administration and from managers on four general topics. The extent to which eleven items can be anticipated, and the extent to which each item must be taken into consideration in decision making were measured, again using a Likert scale.

Five questions measured overall uncertainty. The four-item performance uncertainty scale included in the questionnaire is reported to have an alpha reliability coefficient of .82 (Ashford, 1986). The remaining items were adapted from Georgopoulos (1975) and have no reported reliabilities. The issue of reliability is discussed in the following chapter. Several items were added to the R & T Balance Game for the purpose of assessing internal validity of both instruments.

The R & T Balance Game (Appendix C) was completed by each respondent. The game was developed for this research and was based on the theoretical framework described in Chapter 2. Participants were instructed to place a number for each item within the grid, such that the position of the number corresponded to both the extent to which action concerning the item was necessary and the extent to which the information about the item was sufficient.

The R & T Balance Game was designed to obtain two types of information. First, the game is designed to gain insights into the information and action needs on 23 resource and technological items of relevance throughout the organization. Second, the game was designed to identify patterns of information and decision needs within different organizational components. The list of items was reviewed by two experts in nursing and health administration for comprehensiveness and

comprehensibility. These experts agreed that the game had face validity. Reliability of the game is discussed in the following chapter.

Observation. While the collection of quantifiable data is invaluable for describing hospital and units, such data are substantively augmented by observing what is going on and how the work gets done. Having first-hand observations in the hospital assisted in interpreting the data collected from interviews, records and questionnaires. Therefore, one administrative, two managerial, and four work unitand one collaborative practice meeting were attended. Field notes (Schatzman & Strauss, 1973) were taken regarding the apparent processes at those meetings. While waiting to meet with participants or for meetings to start, patient services flow was observed. Field notes of those observations were made.

Records Audit. Unit communication books and memoranda were reviewed, and two communication data collection forms were developed (Appendices D and E) to obtain information regarding the communication and behavior of organizational members. The Communication Form I was designed to gather information regarding both written and verbal communication. Information from selected memos, reports, minutes and informal conversations was abstracted. Counts of memos sent between different organizational components were recorded on the Communication Form II.

Organizational Data. The case study design requires an exhaustive collection of relevant case data. To collect data systematically about the case, several forms were developed for use with individuals from different organizational components. To minimize the response burden on any one key informant, data collection was distributed among different survey forms, with each respondent receiving a different form, thus the seemingly high number of data collection forms.

One form was used to collect data descriptive of the organization's

environment (Appendix F). Data about the organization's environment, or the community, was collected once by the researcher. Community data included information on the socioeconomic status of the community, and epidemiological characteristics of the population and the health care market.

General information regarding administrative component data and needs were collected on additional forms (Appendices G, H & I). Administrative component data collected included information such as the types of services provided, occupancy rate, number of marketing surveys conducted in the past year, percent changes in operating budget over the past twelve months, number of task forces concerned with strategic planning, and the number of payor sources. Different forms were used to collect information regarding the maternity and oncology units (Appendices J through N) and clinician component (Appendices O, P & P). Organizational data regarding the nursing units included variables such as personnel qualifications and turnover rates, acuity level of patients, and daily census.

Procedure

An introductory letter outlining the research was sent to the hospital administrator. Once a letter of agreement was received, a human subjects application was submitted and approved by both the University of Washington Human Subjects Committee and the hospital institutional review board. A contact person was then established, and names of personnel for participation were provided by the contact person. Letters were sent to those individuals inviting them to participate. Each participant signed a consent form describing the study and outlining measures taken to assure confidentiality (Appendix R). All data were

collected over a three month period. All questionnaires, transcripts, field notes and description data will be kept in a locked location for a period of three years.

Interviews. Interviews with administrative personnel, nurse managers, the physician and nurses were scheduled at their convenience. Interviews were conducted in a private place, such as an office or small conference room within the hospital. All interviews were conducted by the researcher, thus assuring standard administration of the questions. All interviews were audio tape recorded and transcribed verbatim. Once the interviews were transcribed, the tapes were erased as stipulated in the human subjects agreement. All names were deleted from the transcriptions so as to assure confidentiality.

Self-Report Survey. Self-report questionnaires for participants (Appendix B) were sent to all participants at the same time the organizational forms were sent. The NAIBQ was returned to the investigator in sealed envelopes at the time of the interview. To assure confidentiality, respondents were instructed not to sign or place their names on the questionnaires. Questionnaires were identified only by respondents' levels within the organization.

Observations. Following the procedures outlined and detailed by Schatzman and Strauss (1973), field notes of observations were made while attending administrative and unit meetings, visiting the units, or otherwise being in the hospital. The field notes were kept in a confidential place known only to the researcher.

Records Audit. Communication records were accessed as negotiated with the hospital. Memos between administration, nursing management, nurses and physicians were reviewed and data abstracted using the form developed. Memos which were posted or sent either to or from key informants, were abstracted.

Organizational Data. The organizational data forms (Appendices G through

Q) were sent to participating individuals two weeks prior to their scheduled interview. The completed forms were returned to the investigator at the time of the interview. Since no personal data were included on the descriptive forms, anonymity was not required. During the time allocated for the interview, participants could clarify any response or ask for clarification regarding items on the organizational forms. Being able to access additional participants and being able to obtain additional data is one advantage of the case study method.

Summary

In this chapter, the research design, methods and procedures were outlined. The data collection forms are included in Appendices A through T. One hospital participated in the case. Within the Hospital, data were collected from administrative personnel, managerial personnel, and professional providers. The types of data collected included interviews, observations, records data, and self-report surveys. Each type of data required separate analysis. The analysis and results are presented in the following chapter.

Chapter IV: Analysis

The usefulness of the case study method is exemplified in the variety and diversity of data collected in order to develop a total description of the phenomenon of interest in the case. However, development of the Hospital case description required that each type of data collected first be analyzed separately. In this chapter, procedures used to analyze organizational data, interviews, and self-report data from the Needs and Information Balance Questionnaire (NAIBQ), and the Resource and Technology (R & T) Balance Game are discussed, and some descriptive results are reported. The case description is presented in Chapter V, and includes results of these analyses. Chapter VI contains a discussion of the case and themes concerning organizational uncertainty in health services.

Organizational Data

In this section a brief overview is presented of the analysis of the data collected regarding the organization.

Descriptive Data

The organization and unit data were collected on five different forms (Appendices G through N) in order to reduce respondent burden. In addition to the general descriptive information about the organization, specific data were collected about technological needs, patient services, resource needs, and resource availability for each organizational component. Each administrator and manager who participated was asked to complete one form. At the organization and the unit level, more than one respondent completed the same form. Their answers were compared as a reliability check on their responses. On 14 items which were

answered by two individuals, four items received different responses. Those items were whether the number of admissions was more than expected or as expected, the number of acute care beds, the number of RN FTEs, and the number of strategic planning reports received. On all other items there was agreement or differences explainable by the respondent's position in the organization. The organizational data collected were primarily nominal data and are used to derive a description of the Hospital. The description of the Hospital presented in Chapter V is based on these data.

Observational Data

Eight meetings were attended: four nursing staff meetings, one hospital-wide upper management meeting, two nursing management meetings, and one collaborative practice meeting between physicians and RNs. Field notes regarding each meeting, as well as other interactions with Hospital employees, were made. The notes were used as a source of confirmation or clarification about information gained in the interviews, and from the NAIBQ and R & T Balance Game. After analysis of the interviews, the field notes were reviewed for examples of uncertainty as described in the interviews. Observational data are included in the case description presented in the following chapter. Theoretical notes that were included in the field notes were used in developing theoretical statements presented in Chapter VI.

Interviews

Content Analysis

Analyses of interviews were conducted prior to analyses of all other data.

Qualitative, content analysis (Krippendorf, 1979; Issel, Ersek & Lewis, 1990) of all semi-structured interviews (Appendix A) identifyied factors and processes related to uncertainty as experienced by the interviewees. A total of 26 individuals, (four administrators, four associate directors of nursing, five managers, three clinical nurse specialists, one physician, and nine staff RNs) participated in 14 interviews. All interviews were audio tape-recorded, then transcribed verbatim. Syntactical units (Krippendorf, 1979), verbatim statements usually consisting of a noun-verb phrase, were considered the unit of analysis. When a qualifying clause was used to clarify the original noun-verb phrase, the entire statement was coded. Thus, the manifest meaning of statements was preserved. Statements were selected as codable units of analysis if they were direct responses to the question, or a summation of an example, and contained enough information to be interpretable.

Systematic development of domains occurred in iterative steps. Initially, verbatim statements from each question were grouped into categories of similar types of activities and processes. Categories included verbatim data from each organizational layer. Thus, for each question, a set of categories was developed across components. However, several interview questions were designed to elicit similar information around themes of uncertainty, specifically, sources of uncertainty, strategies used to deal with uncertainty, and effects of uncertainty. After coding each question, duplication of categories occurred across questions. When this occurred, categories were developed within each theme using data from similar questions.

Next, domains within each theme were developed. Each domain contained several categories that contained additional descriptions. For example, **Surprises from Interdependencies** was a domain within the theme of sources of organizational uncertainty, and four categories described the types of surprises that contributed to

organizational uncertainty. With further analysis of interviews, both categories and domains were refined. Domain labels were based on participants' statements and the conceptual links among the statements.

In this manner, mutually exclusive and exhaustive categories of verbatim units were developed. Definitions were written for both domains and categories. The resulting set of domains for each theme with corresponding categories are discussed in the following chapter. While the domains are mutually exclusive, interactions and feedback loops existed between domains which are discussed in Chapter VI.

Coding Reliability

Four independent coders with expertise in qualitative analysis participanted in establishing interrater reliability. Using verbatim categories and corresponding definitions, the coders categorized pre-selected responses to questions 1 through 4 on five of the fourteen interviews. Questions 1 through 4 were selected since they were designed as a set of similar questions focusing only on organizational uncertainty. Each coder was provided with a set of definitions for the 28 categories, a set of instructions, and a copy of the transcript through question 4. The verbatim units to be coded were highlighted so that each coder had the same verbatim units to code. A total of 182 statements on the five interviews (average 26 statements per interview, range 14 to 54) were categorized by the coders.

Interrater reliability was then assessed using the Kappa statistic on the 182 statements. The Kappa statistic measures the degree of agreement based on the observed versus expected agreement between two coders (Cohen, 1960), and was chosen over percent agreement because the Kappa statistic reflects agreement between coders that is beyond the amount of agreement possible by chance alone.

Table 4.1. Description of Respondent Groups Based on Data from the NAIBQ.

	RESPONDENT GROUP					
	Admin [n=3]	ADNS [n=4]	Managers [n=4]	CNS [n=3]	Staff RNs [n=9]	MD [n=1]
Age	45 (7)	38 (4)	35 (6)	37 (5)	32 (6)	NA
Yrs. at hosp.	9 (1)	7 (9)	7 (3)	3 (2)	5 (3)	NA
Yrs. in position	2 (.7)	4 (4)	4 (3)	1 (0)	4 (3)	NA
Highest degree	MA	MA	BSN	MN/MSN	BSN	MD

Note: ADNS=Assistant Director of Nursing Service, CNS=Clinical Nurse Specialist

The Kappa statistic is interpreted similarly to other measures of reliability, with higher values reflecting greater interrater reliability, and ranges between 0.0 (no agreement) and 1.0 (total agreement). The Kappa values ranged between .54 and .76 between pairs of coders. The degree of fuzziness of categories, as measured by the Ku, ranged from .74 to .83 which indicates that some addtional category clarification may be needed in order to improve the overall Kappa.

Self Report Surveys

NAIB Questionnaire

Self report NAIBQ data were analyzed using SPSS PC+II. A total of 24 questionnaires were returned, for a return rate of 92 percent. Respondents had been employees at the Hospital for an average of 6.0 years (s.d.=4.7), and in their current positions for an average of 3.9 years (s.d.=3.7). The average age of the respondents was 35.7 years old (s.d.=6.7). A description of respondents by organizational component is shown in Table 4.1.

Data from the NAIBQ initially were analyzed using descriptive statistics. The descriptive statistics showed normal distributions and low percent of missing

Table 4.2. NAIBQ Scales and Cronbach Alpha Reliabilities.

SCALES	Number of items	Scale Mean (s.d.)	Stand. Alpha
Information Sufficiency	11	2.36 (0.68)	.83
Administration Information Sufficiency	4	2.91 (1.08)	.94
Manager Information Sufficiency	4	2.43 (0.84)	.87
Ability to Anticipate	11	2.34 (0.62)	.86
Decision Areas	11	2.47 (0.49)	.70
Information Sources	6	2.50 (0.61)	.80
Interaction of Personnel	2	2.27 (0.75)	.43
Overall Uncertainty	3	2.49 (0.50)	.70
Performance Evaluation	4	3.94 (0.73)	.79

Note: Scales range from 1=highest to 5=lowest.

items. Two types of analyses were planned: reliability of items and possible scales needed to be assessed, and differences between organizational layers needed to be identified.

The NAIBQ was constructed to contain scales related to degrees of need to anticipate, need to take action, ability to anticipate, communication between groups, and adequacy of information. Reliability of these scales on the NAIBQ was assessed based on the data from all 24 respondents using Cronbach's alpha. Although most of the scales had Cronbach's alphas of .65 or greater, these results must be interpreted cautiously given the small sample size of 24. Also, because of the small n, these scales were not used in multivariate analyses. Descriptive statistics for each scale are presented in Table 4.2. The alpha coefficients suggest acceptable levels of internal consistency for the NAIBQ scales.

To identify key differences between organizational layers regarding perceptions about information, communication and decision making, efficient and appropriate methods were needed. Two statistical methods were used: Scheffe's test of group differences and difference scores. One-way analysis of variance and

Scheffe's test of difference between group means were used. The Scheffe test is the most conservative of multiple comparison tests of differences between groups, and includes a correction for unequal group size (SPSS manual, 1988). Because of the small number of respondents per group (3 administrators, 4 assistant directors of nursing, 4 managers, 3 clinical nurse specialists, 9 staff RNs, and 1 physician) and non-independence of the groups, the results were not used to test hypotheses of difference based on statistical significance. Rather, the results were used to identify patterns of differences between the groups from different organizational components.

Differences between group means on all items were calculated. Using group mean difference scores preserves the within group pattern of responses on individual items. Imbalances between the ability to anticipate, the need to anticipate changes, and the adequacy of information were identified in four separate sets of comparisons using group mean difference scores. Results of both the Scheffe's test and the difference in item means on specific items are reported in Chapter V.

The R & T Balance Game

The R & T Balance Game was intended as a visual analog matrix. A total of 24 R & T matrices were completed (return rate of 92 percent) and included in the analysis, although two matrices were missing items. Exhibit 4.1 shows the placement by one staff RN of all 20 items within the matrix. Exhibit 4.2 shows the placement of one item,--8, general fiscal resources--as placed by all 24 respondents on the matrix.

The distribution within the matrix of each of the 20 items is shown in

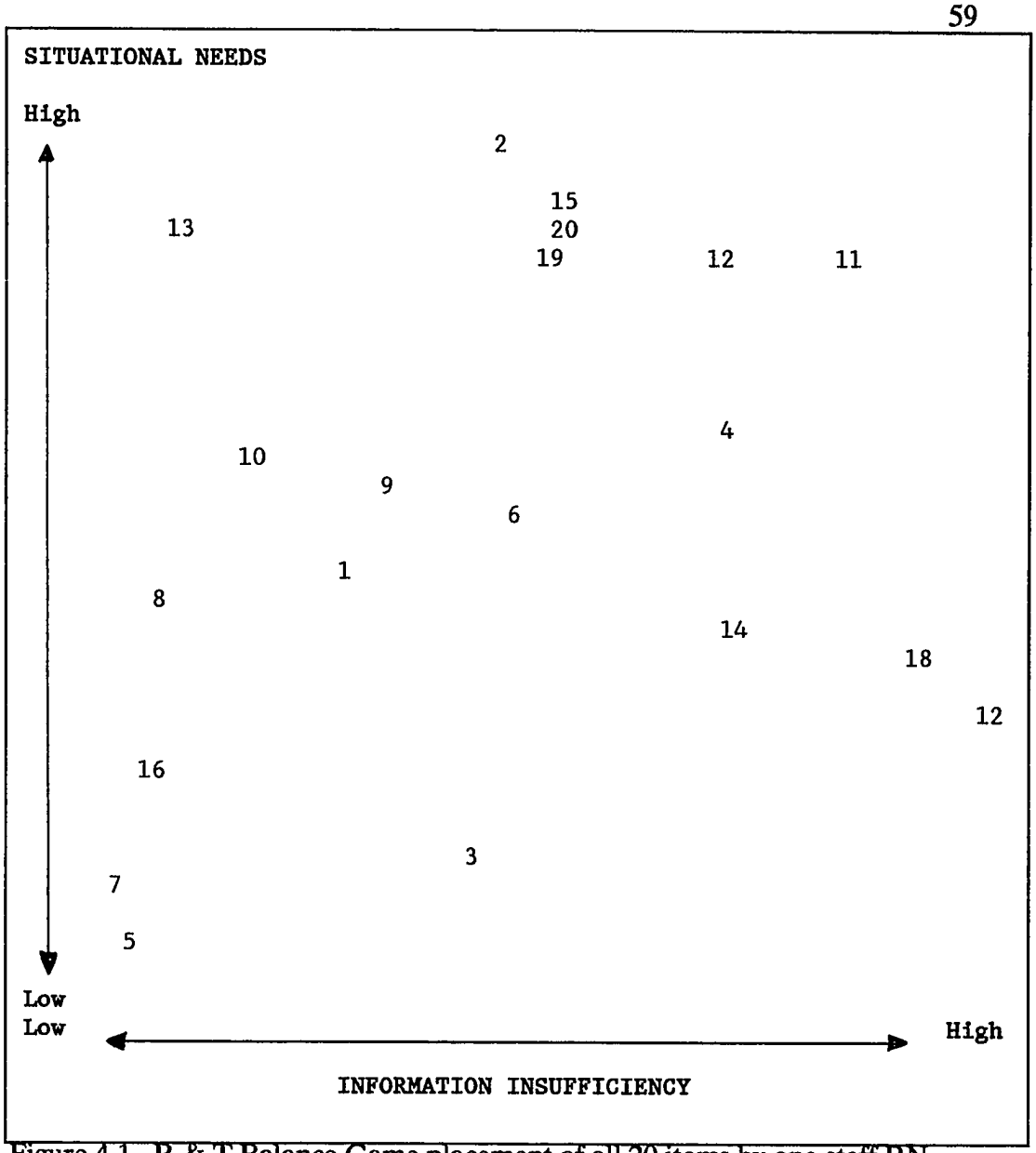

Figure 4.1. R & T Balance Game placement of all 20 items by one staff RN.

1=changes in expenses
2=RN staffing
3=qualifications of professionals
4=new patient related equipment
5=types of insurance or coverage
6=RN turnover
7=MD turnover
8=general fiscal revenues
9=long-term, strategic plans
10=operating budget
11=types of services provided
12=number of patient beds
13=market surveys regarding services
14=number of new patient services
15=patient satisfaction
16=affiliations, contractual agreements
17=patient acuity
18=daily census
19=patient care policies
20=staff policies

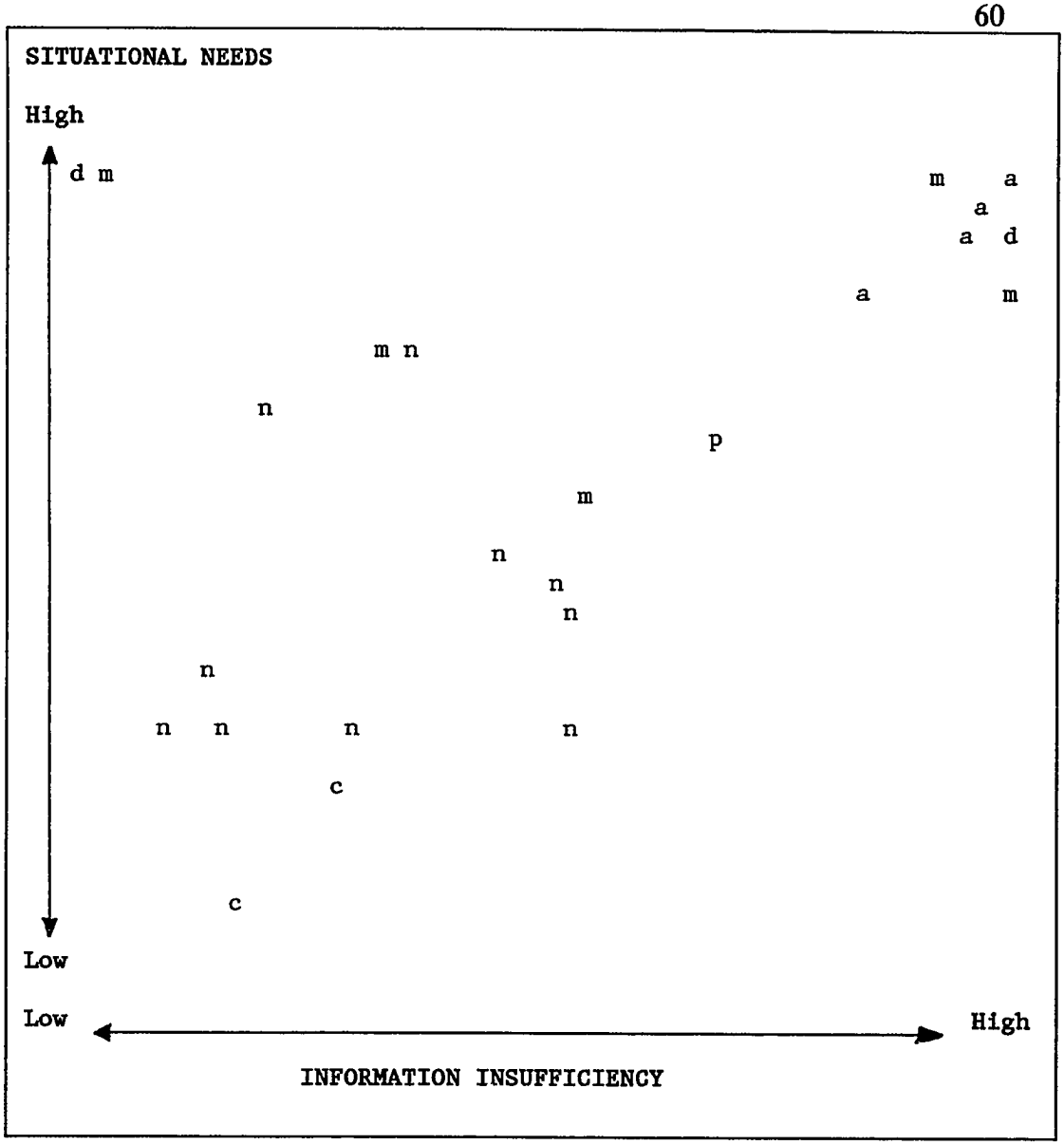

Figure 4.2. R & T Balance Game placement of (8) general fiscal resources by all respondents. Note:a=administrator, d=ADNS, m=manager, n=Staff RN, p=physician, c=CNS)

Appendices O through HH. To analyze the placement of items within the matrix more closely, the matrix was divided into 16 quadrants. The use of the 16 quadrants, rather than 4 quadrants, facilitated the identification of patterns and

distribution among organizational components. Because of the small number of completed matrices per organizational component and the variation in size of the handwritten numbers, statistical comparison of analysis of visual distance was deemed not appropriate.

Analysis consisted of comparing the percent of responses that were in each quadrant, as well as visually identifying distinct clusters or patterns within the matrix, particularly the difference of placement of the items by organizational component. In this manner, patterns by organizational component provided some interpretable contrasts.

The R & T Balance Game was used by the managers on the oncology unit to assess their own situations. As a result of sharing their completed R & T matrices, one unit manager realized that the information she needed would never be available. This realization contributed to her resigning her managerial position and resuming her role as staff RN. This scenario indicated that participants were candid in completing these matrices, and the R & T Balance Game has value in assessing organizational processes and priorities. This scenario is also a testament to the face validity of the game.

Validation of Results

As described in Chapter III, reliability of case study data was enhanced by using multiple sources of evidence, creating a case study data base, maintaining a chain of evidence, and primarily, through the development, documentation and use of data collection protocols. Internal validity was enhanced by pattern matching and building explanations, presented in Chapter VI. External validity was based on analytic generalizations in which generalizations are made about the theory derived from the case analyses and is presented in Chapter VI. Construct validity was

increased by using multiple sources of evidence, establishing a chain of evidence, and having key informants review the case study report.

Multiple sources of data were used to evaluate reliability and construct validity. Data from the NAIBQ and the R & T Balance Game provided validation of the categories derived from the interviews. One example of the value of the multiple sources of data is seen in the data about uncertainty related to patients. The interview category of "patient fluctuations" was frequently mentioned as a source of organizational uncertainty by staff RNs. On the NAIBQ, staff RNs consistently reported having less adequate information and needing more information to consider census and acuity in making decisions than did administrators. On the R & T Balance Game, staff RNs more often placed patient care items in the high need and low information (high uncertainty) quadrant. Another example of reliability and construct validity across measures included uncertainty related to finances. Differences between groups regarding the financial items were consistently noted on the NAIBQ and R & T Balance Game. Consistencies such as these across measures indicated both reliability and content validity of the measures.

Summary

The results of descriptive analysis have been reported for each type of data: organizational data, interviews, observation, and self-report surveys. Each type of data represents only a part of the total case study. To integrate the types of data, each needs to be interpreted along with the other types of data. In the following chapter, the Hospital case description and results are presented and includes an integration of the available information.

Chapter V: Case Description and Results

The case study method was chosen as a means of collecting data in order to result in a thorough description of organizational uncertainty as experienced by persons at different organizational layers. The analysis described in the preceding chapter provided descriptive information. Those data that describe the case and the results from analyses of the interviews and the self-report surveys are presented in this chapter. Interpretations and refinements about organizational uncertainty are provided in the following chapter.

Case Description

The study Hospital, which is part of a private, not-for-profit health care institution, is located in the metropolitan area of a large urban corridor. The Hospital has approximately 300 acute care beds and admits approximately 13,000 patients annually, with an average occupancy rate of 72 percent. Four competing hospitals are located within a two mile radius of the Hospital. All four are of comparable size and provide similar services, such as obstetrical, cardiac, emergency and oncological services.

The Hospital's medical center includes primary care and speciality clinics, a biomedical research center, and a medical residency program. The Hospital has close affiliations with several primary care clinics outside the metropolitan area, and also has contracts with community based clinics that provide services to low income families. Patients are referred from these clinics to the Hospital for inpatient and diagnostic services.

Table 5.1. Factors Influencing the Hospital and Two Nursing Units.

INFLUENCING FACTORS	MENTIONED BY
Community Epidemiology	a,d,m,c,n
Reimbursement Policies	a,d,m,c,n
Competitiveness	a,d,m, n,p
Health Care Costs	a,d, n
Community Demographics	a,d, n
City Regulations	a,d,m
Union Activities	a,d
Community Resources	d,m, n,p
Ecological Environment	d, n
Legal Issues/Regulations	c,n
Consumerism	n,p
Community Economics	n

Note: At least one respondent must have mentioned the influencing factor to be listed as administrators (a), ADNSs (d), managers (m), CNSs (c), staff RNs (n) or physician (p).

Factors Influencing the Hospital

Numerous factors were identified by participants as affecting the Hospital and the specific nursing units (Table 5.1). More than one participant initially responded, saying that "everything is affecting the organization." Administrative personnel, including the Hospital administrator, chief financial officer, and the director of nursing, identified competitors, insurers, unions, and patients as important factors. To managers, including the ADNSs and nursing unit managers, factors important in the environment of the organization were the same as those identified by the administration, as well as ecological environment and community health and human resources. Staff RNs mentioned some of the same elements as important in the external environment, except city regulation. Specifically, childbirth unit RNs said insurers, unions, and social problems, such as drug abuse and adolescent pregnancy, were important community factors affecting their unit. In contrast, oncology unit RNs identified competition with another cancer center in

the city and general community economics as important factors influencing the organization and their unit.

Several of the factors identified as influencing the organization or work unit were also identified as sources of uncertainty, as discussed later in this chapter. Reimbursement, federal and state legislation, and health care costs were mentioned as sources of organizational uncertainty. Not all factors influencing the organization were sources of uncertainty. In fact, of all the factors influencing the Hospital, only those factors directly related to finances and health care delivery were also sources of organizational uncertainty. The physician explained,

> "Global are the impacts of federal government and insurance carriers on the way you practice, the way you manage your patients...financial issues clearly with regard to the Hospital and clinic are much more on the front burner than they used to be, and how that impacts your management of patients in the hospital."

Staying Competitive

Based on observations at meetings and descriptions of organizational activities, there appeared to be five major ways in which the Hospital was striving to stay competitive: 1) reducing expenditures for RN staffing, 2) developing new insurance packages, 3) fostering centers for excellence, 4) creating a corporate culture of excellence, and 5) undergoing strategic planning.

In an effort to more closely monitor and contain costs, a system for determining nursing staff needs based on acuity was initiated throughout the Hospital by using a proprietary system to determine the unit staffing needs. Staff RNs were responsible for recording the acuity and then determining their staffing needs for the next shift. Although staff had received information regarding the system, specific issues about implementation continued to be discussed. Also, the

financial benefits of the system had not yet been realized according to the managers who were responsible for monitoring the staffing expenditures on their units.

To compete in the insurance market in the area, the Hospital developed its own insurance coverage plan that included both outpatient and inpatient services. However, the Hospital did not contract with local independent practitioner associations (IPAs), health maintenance organizations (HMOs), or preferred provider organizations (PPOs) to provide inpatient services. According to one administrative participant, the consequence of this decision was the movement of patients, previously loyal to the Hospital, to other plans that provide inpatient coverage along with the outpatient services. This shift of patients was not foreseen when the decision had been made not to contract with other IPAs, HMOs or PPOs in the market. The issue of providing inpatient services to patients from other insurance plans was also addressed during managers' meetings.

Another aspect of staying competitive was the ongoing development of additional centers for excellence. The Hospital developed centers for excellence in three areas and was recognized regionally for the expertise in these centers. Centers for excellence were designated clinical specialties that received resources for the development of clinical expertise, clinical resources, and advanced technology related to that specialty. The administrative decision to pursue centers for excellence was based on the regional recognition the Hospital receives for these centers for excellence. At the upper management meeting this decision was reviewed and presented to those attending.

Culturally, the Hospital had norms of acknowledging and valuing team members, sharing information, and setting community standards in their areas of excellence. One means of assuring the assimilation of the organizational cultural norms was built into the orientation of new employees, in the form of a video tape

that outlines four major areas in which all employees contribute to the overall performance and quality of the Hospital, including collaboration, quality of service, and comprehensive care. This tape was also shown at the upper management meeting as a means of keeping the managers informed of the work done in public relations and human resource departments.

The Hospital has been reformulating its strategic plan and five year objectives. This process was being accomplished with the input of lay members of the Board of Director as well as administrative members. Nursing and medical staff were surveyed regarding their views of the future of the organization and areas for needed improvement. These data were taken into consideration in the identification of issues to be addressed, and in formation of priorities and strategies. However, some skepticism was expressed by some of the staff RNs regarding the strategic planning process and the extent to which their input would be included in the final plan.

Patient and Staff Characteristics

According to those interviewed, although the Hospital provides some community charity care, the typical patient coming to the Hospital for services is middle to upper middle class, fairly well educated, has good medical insurance coverage, and is motivated to engage in selfcare. Because of the Hospital's reputation, patients also come from locations outside the state and the region. Approximately 36 percent of patients have Medicare, 10 percent have Medicaid, 18 percent are enrolled in an HMO/PPO plan, and 30 percent have indemnity insurance.

A total of 200 RN FTEs are employed to provide inpatient services in 15 nursing departments. The Hospital RN turnover rate is 10 percent. Data were

collected on two nursing units; the Childbirth Unit and the Oncology Unit. There are six labor/delivery/recovery beds and 18 postpartum beds in the Childbirth Unit. The oncology unit has 27 beds. The Childbirth Unit has 40 staff RNs, 40 percent of whom work a 0.8 FTE or greater, and the Oncology Unit has 37 staff RNs, 43 percent of whom work a 0.8 FTE or greater. Both Units have at least one clinical nurse specialist who works a .5 FTE.

An average of 125 infants are delivered per month in the Childbirth Unit. The Hospital offers consumers the option of deliveries by nurse midwives. The Childbirth Unit, particularly the labor and delivery unit, is seen as an innovator in the community, with the remodeling of the labor and delivery unit to include many state-of-the art comfort measures and technologies for patients. One locum tenens, a physician, who had practiced around the country, praised the Childbirth Unit as the best he had ever experienced. Also, the nursing staff had been asked by an editor to contribute an article to a nursing journal for an issue featuring innovations.

The typical patient who delivers at the Hospital, according to those interviewed, is one of three types: 1) well educated and professional, 2) non-English speaking (primarily Southeast Asian), or 3) a Medicaid recipient with minimal prenatal care. The average age of the mothers is 30. The average Apgar scores at one and five minutes are 8 and 9. Less than 3 percent of newborns were less than 36 weeks gestation. Only 2 percent of mothers had planned, early discharges of less than 24 hours.

The typical oncology patient, again according to those interviewed, is older middle age, well educated, well insured, and has support from the family. The oncology patients tend to fall into one of three categories: 1) admitted for less than 24 hours to receive chemotherapy, 2) a long term patient (e.g., received a bone marrow transplant), or 3) terminal. Thirty-five percent of all the deaths in the

Hospital occur on the oncology unit, and of those, 95 percent were anticipated and for which the patient received care designed for the dying patient.

Inpatient care throughout the Hospital is provided using a group practice model in which physicians work in teams. Each patient is assigned to a team of physicians, which includes residents. Physicians also work collaboratively with RNs by having regularly scheduled unit meetings, at which time cases are reviewed or practice issues discussed. Physicians, unit managers and staff attend these collaborative practice meetings. Of the two units included in this study, one unit had regularly scheduled meetings and had more participation, while the other unit did not. Nonetheless, staff RNs from both units expressed confidence in the attending physicians and in having their support in clinical practice issues. As one staff RN said, "I've never seen such collaborative relationships with physicians and nurses...the attending [physicians] respect the nursing staff."

Changes on the Nursing Units

At the time of this research study, nursing management throughout the Hospital was being restructured by consolidating responsibilities of nursing managers into fewer positions and by eliminating some of the managerial responsibilities of clinical specialists. The restructuring of the nursing management hierarchy was viewed as a flattening of the organization, and an increasing of the responsibilities of the unit managers. A different type of restructuring was also in progress at the level of direct service delivery. Based on financial considerations, a decision was made to reconfigure the nursing staff from 100 percent RNs to a combination of 80 percent RN and 20 percent LPNs or NAs. Thus, primary nursing was becoming more team nursing and required some team leading. This issue of changing from a primary nurse to a modified team approach was discussed at the

unit staff meetings.

One major change occurred on the Childbirth Unit within the past year when a group practice of obstetricians resigned from the staff of the Hospital. This drastically reduced the number of obstetricians available to do deliveries and to bring in new patients. At the time of this study, new physicians had been hired and others were in the process of being interviewed. Explanations given by the interviewees for the exit of the physicians included poor communication between physicians and hospital administration, and unacceptable financial arrangements. The primary difficulty in the oncology unit according to participants was related to staffing using the acuity system that was instituted throughout the Hospital. The nursing staff felt strongly that, by staffing according to the new acuity system, the unit was understaffed. Several interviewees mentioned that the oncology unit had special support group type meetings, and a special meeting with the nursing administrator concerning this issue. The issue remained unresolved at the time of the study.

Balance of Information and Need

Respondents rated the sufficiency of information for different items on both the R & T Balance Game and the NAIBQ and responded to interview questions concerning the mode of communication among groups from different organizational components. Together these data provide an overall description of the balance between information availability and the sufficiency of information and decision making or taking action.

Adequacy of Information and Communication Patterns

Table 5.2. Overall scores for information sufficiency from administration (A) and managers (M) according to respondents from different organizational components.

SUFFICIENCY OF INFORMATION FROM	RESPONDENT GROUP				
	Admin	ADNS	Mgr	CNS	NUR
A	2.08	1.88	2.65	2.58	3.89
M	2.08	1.92	2.25	1.84	2.95

Note: admin=administration, ADNS=associate directs or nursing services, mrg=manager, CNS=Clinical nurse specialist, nur=nurses. Items range from 1=completely sufficient to 5=not at all.

Some communication patterns are revealed by comparing groups from different organizational layers using the NAIBQ data. Information exchange appears to vary between five groups. Information from administration regarding fiscal resources was less sufficient for staff RNs than for other groups (Scheffe's test, $p<.10$), and less sufficient regarding personnel resources for RNs than all groups except managers (Scheffe's test, $p<.10$).

Table 5.2 shows the mean score for each group of respondents on the sufficiency of information from administrators and managers. In comparison to all other groups, as reflected in group means, staff RNs had the least sufficient information from the administration regarding patient needs. Of all groups, staff RNs rated the sufficiency of information from the administration as the lowest, and ADNSs rated the sufficiency of information as the highest. Staff RNs also rated the sufficiency of information from managers as the lowest, and CNSs rated the sufficiency of information as the highest. The largest differences in the sufficiency of information between the administration and managers was for CNSs. Two specific items contributed to this difference. For CNSs the greatest difference between the sufficiency of information from managers and the administration was

Table 5.3. Mean scores (standard deviations) for extent of communication between pairs of groups from different organizational components according to respondents from different organizational components.

EXTENT OF COMMUNICATION BETWEEN	RESPONDENT GROUP				
	Admin (n=3)	ADNS (n=4)	Mgr (n=5)	CNS (n=3)	NUR (n=9)
A-P	2.33 (1.15)	2.33 (0.58)	2.67 (0.58)	4.00 (0.00)	2.83 (0.41)
A-M	2.33 (1.15)	1.50 (1.00)	2.40 (0.54)	2.33 (0.57)	2.25 (0.70)
M-P	1.33 (0.57)	2.25 (0.94)	2.40 (1.14)	2.00 (1.00)	1.67 (0.71)
M-N	1.33 (0.57)	2.00 (0.81)	1.20 (0.45)	1.00 (0.00)	1.67 (0.50)
N-N	2.00 (1.00)	2.25 (0.50)	1.80 (1.30)	2.00 (1.00)	1.33 (0.50)
N-P	1.00 (0.00)	2.00 (0.82)	2.00 (0.71)	1.33 (0.58)	1.87 (0.93)
N-*	2.33 (1.15)	2.33 (0.58)	2.67 (0.58)	4.00 (0.00)	2.83 (0.40)
N-#	2.33 (0.58)	2.50 (0.58)	2.00 (0.71)	2.00 (0.00)	2.22 (0.67)

Note: administrators (A), managers (M), staff RNs (N), physicians (P), patients (*) and ancillary personnel (#). Admin=administration, ADNS=associate directors or nursing services, mrg=manager, CNS=Clinical nurse specialist, nur=nurses. Scores range from 1=completely to 5=not at all.

on the topics of consumer demands and patient needs. The CNS received much more sufficient information from the managers on these topics.

The exchange of information must occur between two individuals, or individuals from two different organizational components. The perceived extent of communication between pairs of groups within the organization is shown in Table 5.3. The greatest difference in perceptions regrding the of extent of communication is between administrators (2.33) and from CNSs (4.00) on the extent of communication between administration and physicians (A-P). The most communication seems to occur between the staff RNs and physicians (N-P), according to the high scores from all groups. No items in this section were significant using the Scheffe's test. Overall, communication between groups was perceived to occur to a adequate extent.

The adequacy of the information exchanged is shown in Table 5.4. No items

Table 5.4. Mean scores (standard deviations) for adequacy of information from different organizational layers according to respondents from different organizational components.

ADEQUACY OF INFORMATION FROM	RESPONDENT GROUP				
	Admin (n=3)	ADNS (n=4)	Mgr (n=5)	CNS (n=3)	Nur (n=9)
A	2.00 (1.00)	2.25 (0.05)	3.20 (0.84)	2.67 (1.15)	3.67 (0.87)
M	2.00 (1.00)	2.50 (0.71)	2.00 (0.71)	1.33 (0.58)	2.33 (0.50)
N	2.33 (1.15)	3.00 (0.00)	1.80 (0.84)	2.00 (0.00)	1.87 (0.60)
P	1.66 (0.58)	2.50 (0.71)	2.80 (1.64)	2.67 (0.58)	2.56 (1.01)
*	2.33 (1.15)	3.00 (0.00)	2.40 (1.14)	2.00 (0.00)	2.00 (0.50)
#	2.00 (1.00)	3.00 (0.00)	3.40 (0.89)	3.33 (0.58)	3.22 (0.67)

Note: administrators (A), managers (M), staff RNs (N), physicians (P), patients (*) and ancillary personnel (#). Admin=administration, ADNS=associate directors of nursing services, Mrg=manager, CNS=Clinical nurse specialist, Nur=nurses. Scores range from 1=completely to 5=not at all.

in this set were significant using the Scheffe's test. Most interesting is that administrators rated the adequacy of information from physicians higher than did all other groups. Staff RNs perceived the information from administration and ancillary personnel asbarely adequate. The range of adequacy of information was least when the information source was either managers (1.33 to 2.33) or patients (2.00 to 3.00). This result reflects some agreement among the groups on the adequacy from these sources. The adequacy of information can be a matter of perception. One oncology manager observed that, "Sometimes we assume that saying something will automatically make it understood or embraced."

One set of questions in the interview asked specifically about the ways in which different groups communicate. Table 5.5 shows the method of communication between groups from different organizational components as reported by all participants.

Table 5.5 identificaties where different communication methods were listed

Table 5.5. Modes of communication between different pairs of organizational groups from different organizational components according to respondents from different organizational components.

MODES OF COMMUNICATION	COMMUNICATION BETWEEN ORGANIZATIONAL GROUPS					
	PHY-MGR	ADM-MGR	ADM-NUR	MGR-NUR	NUR-PHY	ADM-PHY
Meetings	d,c,n	**A,d,c,M,n**	**A,d,m,N**	**M,c,N**	a,d,m,n	a,d **n**
Reports			**A,d N**			
Letters		n	**A N**			n
Oper Bedside		d n	**A,d N**			
Postings			n	d,M,c,N		
Notes	n			M,c,N		
One-to-one	c,n,p	d n,p		a,d c,n	c,n	a n
Phone call		d		m	n	a
Thru another	p	d,n	n			
Memos	n	n	n		n	a n
Commun book		n	d c,n			
Retreat		n				m

Note: The mode must have been mentioned by at least one respondent to be listed as administrators (a), ADNSs (d), managers (m), CNSs (c), staff RNs (n) or physician (p). PHY=physician, ADM=administration, MGR=manager, NUR=nurses. Bold indicates agreement between pairs of respondents.

by different organizational members. One to one communication included meeting someone in the hallway, having a private office conversation, or other face-to-face contact. Operation Bedside was a sanctioned time for administrators to shadow direct care givers and thus observe first-hand or participate in the delivery of care. Most noteworthy is that virtually all groups report that information was exchanged in meetings, including committee meetings. Also of interest is that staff RNs viewed everyone as communicating through memos, and listed the most diverse modes of written communication (notes, communication book, memos, posting, and letters). The reporting of similar modes of communication by the two organizational groups listed is missing in four of the six pairs. Only communication between the nurse-manager and nurse-administration were similar. As one staff RN from the oncology

unit observed, "Communication implies that it's two ways." The lack of similarity of reported modes of communication may be related to this staff RN's observation and implicit recognition of the lack of two-way communication.

Anticipating Changes and Actions

Being able to anticipate specific changes related to resources and technology within the organization has the potential to reduce organizational uncertainty. The ability to anticipate such changes varies among groups. Staff RNs were less able to anticipate revenue changes than were administrators, and less able to anticipate expenditure changes than either administrators or ADNSs (Scheffe's test $p<.10$). However, administrators were better able to anticipate reimbursement changes than either staff RNs or managers (Scheffe's test $p<.10$).

The ability to anticipate changes, the need to anticipate changes, the need to take actions, and the adequacy of information each becomes important in relation to the other. Imbalances among these factors were identified for each group in the following four separate sets of comparisons using group mean difference scores: 1) information sufficiency and the ability to anticipate changes; 2) sufficiency of information and the need to take action; 3) the ability and need to anticipate changes; and 4) the need to anticipate and the need to take action.

1) The extent to which each group needed to take actions or make decisions regarding various factors in decision making or actions varied significantly on five items. ADNSs were less able to anticipate technological changes than staff RNs or CNSs (Scheffe's test $p<.10$). ADNSs also needed to anticipate the work of others when making decisions to a greater extent than did managers (Scheffe's test $p<.10$). Administrators needed to anticipate revenue and reimbursement changes when making decisions to a greater extent than did staff RNs or CNSs (Scheffe's test

$p<.10$). CNSs, more than all other groups, needed to make decisions regarding changes in medical technology (Scheffe's test $p<.10$). Managers needed to anticipate patient acuity in decision making to a greater extent than did administrators (Scheffe's test $p<.10$).

Imbalances between the sufficiency of the information and the ability to anticipate were assessed in the areas of technology, finances, census, and reimbursement. In each area, an imbalance existed for three or more groups. With regard to technology, the largest difference was for managers; they reported having less ability to anticipate changes than the sufficiency of the information. All groups reported being less able to anticipate census changes than the sufficiency of census information. The difference regarding census changes was greatest for CNSs and ADNSs. An imbalance, or difference, also existed for all groups regarding finances, with staff RNs and CNSs having noticeably less ability to anticipate fiscal changes than the sufficiency of fiscal information. Regarding reimbursements, no imbalance between ability to anticipate and information sufficiency was found for ADNSs; all other groups had an imbalance, with managers reporting the least ability to anticipate changes in reimbursement given the sufficiency of information.

2) The imbalance between the sufficiency of information and the need to take action regarding an issue is an important factor that varied between groups from different organizational components. The analyses are limited to the areas of technology, finance, census, and reimbursement. Generally, the information available was more sufficient than the need to act on the information or to make a decision. While the differences in the sufficiency of information and need to anticipate tended to be small, the difference was greatest for managers regarding acuity. Imbalances occurred particularly in the area of census. Managers reported having more information about census changes than their need to anticipate those

changes in decision making. Many staff RNs reported in the interview that they were often responsible for scheduling staff for the following shift, and that staffing decisions were primarily based on census. ADNSs and administrators had more sufficient information regarding medical technology than their need to take action.

3) The NAIBQ data indicate that all groups had less ability to anticipate changes than their need to anticipate those changes as a part of their work. The largest imbalances occurred in the areas of manpower changes, reimbursement, census, acuity, and patient population changes. Both staff RNs and administrators generally had less ability to anticipate manpower changes than the need to anticipate these in their specific work situations. Managers and ADNSs had a greater need to anticipate reimbursement changes in their work than the ability to anticipate those needs. Staff RNs, CNSs and managers all had a greater need to anticipate census and acuity changes than their ability to anticipate those changes as part of their work. CNSs, managers and ADNSs had a greater need to anticipate patient population changes than their ability to anticipate those changes.

4) Imbalances also existed between the need to anticipate specific areas in relationship to work and the need to take action. Staff RNs had more need to anticipate technological changes, patient care policy changes, and revenue changes and less need to anticipate reimbursement changes than their need to take action on these matters. CNSs had more ability to predict patient population changes and reimbursement changes than their need to act on these matters. Managers had less need to anticipate manpower changes, and more need to anticipate technological changes than their need to take action regarding these changes. The need to anticipate changes in manpower and expenditures was greater than the need to act upon these for the ADNSs. Finally, administrators had a greater need to anticipate changes regarding patient population, census, acuity and patient care policies than

Table 5.6. Ways in which information adequacy and the urgency for action are gauged for resource and technological decisions as mentioned by respondents from different organizational component.

FACTORS IN MAKING DECISION	DECISION REGARDING RESOURCES	TECHNOLOGY
Information		
Never adequate	a,d,m,c,n	n
Use intuition/experience	a,d,m,c,n	n
Gather/have information	a, m,c,n	a,d,m,c,n
Need for Action		
Use intuition/experience	m, n	n
Needs at the time	d, n,p	m, n
Reaction of others	a,d, n	m
Affects on patient care	c,n	d, n
Financial implication	a,d, p	a, p
Consequences of no action	a,d, n	

Note: The category must have been mentioned by at least one respondent to be listed as administrators (a), ADNSs (d), managers (m), CNSs (c), staff RNs (n), or the physician(p)

their need to take action on these matters.

Adequacy and Need

A review of the R & T Balance Game matrices for each of the 20 items showed that overall, respondents felt that they had sufficient data for their needs as revealed by the high percentage of item placements in the high certainty quadrant. A difference among the organizational components on the placement of four items was noted, namely changes in expenditures, general fiscal resources, operating budget and long term strategic plans. In the matrices for each of these, there was a separation between the administrators and ADNSs as one group from the staff RNs

and CNSs as another group, in the placement of the item. While the administrative component had highly sufficient information and high need to take action (high certainty), staff RNs and CNSs had insufficient information and generally had a moderate to high need to take actions (uncertainty). Two items, market surveys related to patients using services and patient satisfaction, had unique patterns. For a large portion of staff RNs and unit managers, some degree of imbalance between the sufficiency of data and the need for actions (uncertainty) occurred for these two items. Specifically, staff RNs from the Childbirth Unit and the oncology managers had insufficient information for their high need to act regarding market surveys related to patients using their services.

In the interview, participants were asked to describe how they gauged whether the information was adequate, and how they gauged the urgency (need) to make a decision or take action regarding resources and technology. Typical resource decisions involved allocating resources, staffing, purchasing, and professional practice decision making. Typical decisions about technology involved only purchasing and professional practice decision making. Table 5.7 shows which groups mentioned different ways to gauge the adequacy of information and the urgency for decisions about both resources and technology. Interestingly, the adequacy of information and the urgency for action is gauged differently for decisions about resources and technology. All groups stated that information needed for resource decisions was gauged never to be adequate, or that adequacy was based on experience or intuition. However, only staff RNs expressed these views regarding decisions about technology. Whether the decision concerned resources or technology, almost all groups attempted to assure or assess the adequacy of the information available to them at the time of the decision by gathering information. The urgency for taking action was influenced by several

factors relevant to different groups, depending on whether the decision pertained to resources or technology.

Perceptions of and Responses to Uncertainty

Subjective information about perceptions of and responses to, uncertainty are derived from a qualitative analysis of the interviews. Five major sources of uncertainty were identified in the interviews. Organizational uncertainty had effects on individual feelings, performance, and unit management. Participants also described three major types of strategies used to deal with organizational uncertainty.

Sources of Uncertainty

Five major sources of the uncertainty identified from the interviews were 1) **Patient Fluctuations**, 2) **Surprises from Interdependencies**, 3) **Internal Processes Not Under our Control**, 4) **Personal Limitations** and 5) **External Pressures on the Organization.** Each of these sources of organizational uncertainty had specific characteristics. The sources and defining categories are listed in Table 5.8.

Patient Fluctuations was a major source of uncertainty, particularly for staff RNs, and was mentioned by all respondent groups except administrators. The almost constant changes in census and acuity of patients were the key characteristics of the source of uncertainty called **Patient Fluctuations.** For the most part, participants saw the fluctuations as normal, and as a natural consequence of providing acute care services. One staff RN from the Childbirth Unit explained, "People don't make appointments, they don't schedule their deliveries, they don't tell you they are going to have an emergency."

Table 5.7. Sources of uncertainty mentioned by respondents from different organizational components.

SOURCES OF UNCERTAINTY	MENTIONED BY
PATIENT FLUCTUATIONS	
Volume and census	d,m,c,n
Care requirements	d,m,c,n
SURPRISES FROM INTERNAL INTERDEPENDENCIES	
Interpersonal surprises	a,d,m,c,n
Gaps across unit boundaries	a, m,c,n
Lack of communication and information	a,d, n
Inter-professional valuing	n
INTERNAL PROCESSES NOT UNDER OUR CONTROL	
Unexpected things come up	a,d,m,c,n
No control over own practice	a, c,n,p
No influence over interdependencies	a,d, c,n
PERSONAL LIMITATIONS	
Beyond own expertise	d,m,c,n
Cannot forecast the future	a,d,m,c,n
EXTERNAL PRESSURES ON THE ORGANIZATION	
Economic and payment changes	a,d,m, n,p
Technology and patient care changes	a,d

Note: The category must have been mentioned by at least one respondent to be listed as administrators (a), ADNSs (d), managers (m), CNSs (c), staff RNs (n), or the physician (p).

Surprises from Interdependencies was a source of uncertainty in which interconnections between departments and among individuals affected the work of those individuals in ways that are unanticipated or highly variable. Four types of surprises were identified. "Interpersonal surprises" stemmed from the unreliability of the reactions or behaviors of other individuals. Human nature, staff morale, and personnel crises were included as interpersonal surprises that contributed to uncertainty. "Interpersonal surprises" was the only type of surprise that was mentioned by at least one respondent from each group.

"Gaps across unit boundaries," another type of **Surprise**, occurred because of the lack of role clarity, discrepant agendas, or lack of perceived assistance from other departments. "Lack of communication and information," also a type of **Surprise**, was the perceived insufficiency of available information, or insufficiency of communication of information. Not having all the information, not having questions answered, lack of being educated about changes, and lack of computerized information all contributed to the lack of communication and information that then created **Surprises.**

"Interpersonal valuing" was the lack of appreciation by other professionals of the work done and also contributed to uncertainty. Only staff RNs saw the lack of being valued as a source of uncertainty. An oncology staff RN explained, "...there are so many other people interfacing who have no concept of what your job is...it's inefficiency of other departments and their inability to understand the impact it has on us."

The third source of uncertainty was **Internal Processes not Under our Control** referred to the lack of ability on the part of individuals to determine their own actions due to either lack of sanctioned authority to influence others, or to anticipate situations. Three characteristics of **Internal Processes** were identified in the interviews. First, members for all organizational levels expressed that at times they had "no control over their own practice," in other words,they perceived a lack of professional self-determination. One staff nurse reflected on this: "And I began to realize that even though I am a nurse employee and have my own nursing career to keep me employed, that I really am dependent on the patient load that is generated by physicians."

Another category was "not having influence over interdependencies," which was a perceived lack of empowerment to affect changes in others who have an

impact on their own work. An example was the lack of control by the staff RNs over the number or timing of patient admissions. For a manager and administrator, not having influence over interdependencies included an ongoing lack of resolution of problems. Also, "unexpected things happened" over which members had no control. "Unexpected things" consisted of events not within the normal range of occurrences, or that could not be anticipated. The unpredictability was described by one manager as, "Where any one of us come into work and you think you are going to do X, Y, Z and you do 1, 2, 3."

Personal Limitations was the fourth source of uncertainty and was the inability to respond to or anticipate situations due to an individual's lack of professional knowledge or expertise. **Personal Limitations** was characterized by two factors. The first factor was being "beyond own expertise" in a situation that called for professional knowledge or skills beyond those currently held by the individual. The second factor, "cannot forecast the future," was a state in which, due to the lack of personal ability or lack of sufficient data, the individual could not anticipate events, responses, or situations. One staff RN explained,

> "You really can't accurately forecast the future. If something falls out of a pattern, if somebody or something falls out of a pattern of what's supposed to happen, then you really can't say. You can't really forecast with any degree of certainty what's going to happen."

External Pressures on the organization, another source of uncertainty, consisted of forces external to the organization that were perceived as having an affect on the actions or decisions of organizational members. The external forces were of two types: "economic, regulatory and payment system changes," and "technological and patient care changes." The economic changes consisted of new or different regulations or requirements that affected the fiscal welfare of the

organization. The "technological changes" contributing to uncertainty were new scientific knowledge, or different modes of caring for patients.

Effects of Uncertainty

Uncertainty seemed to have an emotional effect as well as a behavioral effect on performance (Table 5.9). Emotional effects consisted of personal feelings of negativity, or positive affect related to the uncertainty or the situations created by the uncertainty. "Feeling stressed," the negative affect, encompassed frustration, interpersonal tension, and feeling unsure of self. According to one staff RN, "Uncertainty and stress go hand in hand." A CNS was also candid in saying, "It's really scary for me. What if..." The positive affect, "enjoy some parts," consisted of a positive appraisal of the challenges resulting from or associated with uncertainty. Staff RNs were the only group that did not mention "enjoying some parts" of the uncertainty, whereas administrators were the only group that did not mention "feeling stressed."

Individual Performance, the ways in which individuals were able to carry out their work responsibilities, was also affected by uncertainty. "Time management and task accomplishment" affected all groups in that difficulties in planning work, being disorganized, and having to re-start tasks all occurred. Also affected was "decisions making" such that decisions were more cautious, or more carefully inclusive of more information. "Patient care decisions" were another characteristic of **Individual Performance** that was affected. Uncertainty, especially the unreliability of working because of census fluctuations, had a personal effect on staff RNs. As a result of fluctuations in patient care requirements and unpredictable admissions, individual staff RNs were not able to anticipate their workload or schedule. For the managers, the fluctuations affected their ability to be organized

Table 5.8. Effects of Uncertainty mentioned by respondents from different organizational components.

EFFECTS OF UNCERTAINTY	MENTIONED BY
AFFECTS FEELINGS	
Feeling Stressed	d,m,c,n
Enjoy Some Parts	a,d,m,c
AFFECTS INDIVIDUAL PERFORMANCE	
Time management/task completion	a,d,m,c,n
Decision making	d, c,n
Patient care	n
Affects paycheck	n
AFFECTS UNIT/ORGANIZATIONAL MANAGEMENT	
Staffing/scheduling	d,m, n
Assignment/workload	n

Note: The category must have been mentioned by at least one respondent to be listed as administrators (a), ADNSs (d), managers (m), CNSs (c), staff RNs (n), or the physician (p).

and accomplish tasks. Decisions regarding staffing and patient care were most affected by the uncertainty stemming from fluctuations in patient admissions or condition.

Strategies

Several strategies for dealing with organizational uncertainty were identified from the stories and responses to a question asking what participants "can do or do" about the uncertainties they experience. Three types of strategies were used across all organizational levels to deal with uncertainty: **Open Up Communication, Go with It,** and **Proactive Positioning.** In Table 5.10, the strategy domains and categories are listed.

Open Up Communication was a strategy that included an increase in the

Table 5.9. Strategies Used to Deal With Uncertainty mentioned by respondents from different organizational layers.

STRATEGIES	MENTIONED BY
OPEN UP COMMUNICATION	
Share information	a,d,c, n
Support one another	a, n
GO WITH IT	
Adjust attitude/expectations	a,d, c,n
Adapt to changes	d,m,c,n,p
PROACTIVE POSITIONING	
Access expertise	d, n
Being assertive	m, n
Build-in systems	a, m,c,n
Assess and plan	a, m, n,p

Note: The category must have been mentioned by at least one respondent to be listed as administrators (a), ADNSs (d), managers (m), CNSs (c), staff RNs (n), or the physician (p).

exchange of information and the support of peers. "Sharing of information" as a means of increasing the exchange of information included gaining, seeking out or providing information to other professionals or patients. One ADNS said,

> "If you are part of the information flow, you usually are able to predict better. And those who depend upon you, if you're able to give them certain kinds of information, in turn can predict better."

"Support of one another," as a means of opening up communication, consisted of the development of or the existence of working relationships characterized by rapport and caring. An administrator explained the value of supporting one another in the face of uncertainty:

> "And if you create a caring atmosphere, that's very nourishing, and it will take any form of uncertainty and not be overwhelmed by it. So, you know, you

overcome all odds if you know that there is someone there to give you support and someone is understanding of what you're about."

Going with It was another strategy for dealing with uncertainty; it consisted of altering the perception of the situation, or responding to situations with new, flexible, or alternative behaviors. "Adjusting attitude or expectations," as one means of **Going with It**, reflected having or acquiring an acceptance of situations or conditions of uncertainty. In contrast,"'adapting to changes" consisted of behavioral responses to situations or conditions by being flexible, reprioritizing, or taking advantage of the situation.

The third type of strategy was **Proactive Positioning**, which included taking actions to enhance the ability to anticipate or respond to situations. **Proactive Positioning** had four characteristics: "access expertise," "assess and plan," "be assertive," and "build in systems." By locating and acquiring professional knowledge from either the scientific literature or other experts, the participants were "'accessing expertise.'" "Assessing and planning'" encompassed monitoring situations, evaluating the status of situations, and collecting information necessary to formulate a plan designed to provide optional courses of action. Staff RN's assessment of patients and administrators' carrying out the strategic planning were ways of "assessing and planning." A few nurses mentioned the need to "be assertive" in order to get what they needed when the situation had elements of uncertainty. "Building in systems" was the existence or development of organizationally sanctioned plans that were intended to minimize sources or consequences of uncertainty. Specific systems, such as being a self-staffed unit and having labor patients calling the hospital before leaving home, were designed and implemented to buffer the staff RNs and to try to make work-life more predictable.

Table 5.10. Factors which make decisions regarding resources and technology risky decisions as mentioned by respondents from different organizational components.

FACTORS THAT MAKE DECISIONS RISKY	DECISION REGARDING RESOURCES	DECISION REGARDING TECHNOLOGY
Financial consequences	a,d,m,c,n	a,d, c,
Personnel issues	d, n	d,m,c,n
Patient care/safety	d, c,n	d, n
Lack information	a, c,n	d,m, n
Judgment error	a, n	d, n
Clinical opinion		a,d, n
Lack technological expertise		m, n

Note: The category must have been mentioned by at least one respondent to be listed as administrators (a), ADNSs (d), managers (m), CNSs (c), staff RNs (n), or the physician (p).

Risky Decision Making

Regardless of the strategy adopted to deal with the uncertainty, some decisions seemed risky to the individual. Participants were asked what makes decisions regarding resources and technology risky. Identified factors are shown in Table 5.11. The possibility of adverse financial consequences was mentioned by the most groups for decisions regarding both resources and technology. While many of the same factors for both decisions were mentioned by staff RNs, administrators mentioned different factors for decisions about resources and for technology. Decisions regarding medical technology were uniquely affected by clinical opinion and expertise of practitioners regarding the technology. Implicit in some statements regarding patient safety and clinical opinion was an evaluation of riskiness based on a consideration of benefits, consequences, and probable outcomes, as demonstrated in this quote from a staff RN:

> "Well, [what] you have to balance, is the information you're going to get by doing this technology thing, this intervention; is the information worth the risk

of doing it? Is there a potential risk to the mom or the baby? And, yes, there might be, but the end result is...it will prevent something that is more risky to them."

Summary

Data were collected in one hospital from four administrators, four assistant directors of nursing, four managers, three clinical nurse specialists, nine staff RNs, and one physician. The Hospital was a medical center with an administration committed to creating an environment in which quality health care could be provided, and where staff RNs were proud to work. Nonetheless, organizational uncertainty was experienced at each organizational component.

Data from the interviews suggested that the normal fluctuations in admission and conditions of patients, surprises from internal interdependencies, lack of control over internal processes, personal limitations, and external pressures all were sources of uncertainty for organizational members from different organizational components. Uncertainty seemed to affect emotions, individual performance, and to a lesser extent, managerial considerations. Also, organizational members used a variety of strategies for coping with the uncertainty in their jobs, specifically they learned to adjust by going with it, opening up communication, or taking a proactive position.

Results from the NAIBQ suggest that imbalances between information and need for the information existed for members of different organizational groups. In reviewing the data from the R & T Balance Game, very few patterns of information and decision needs were discernable within organizational components. Notable exceptions involved finances, patient acuity and consumer demands.

In the next chapter, an interpretation of the data focuses on imbalances and themes within the case. A definition of uncertainty that reflects the data is proposed and defining characteristics are presented. Finally, various perspectives on uncertainty are critiqued based on the case and the definition of uncertainty.

Chapter VI: DISCUSSION OF ORGANIZATIONAL UNCERTAINTY

In the first section of this chapter a discussion of the case is based on an integration of data from the different sources. From the case discussion, four themes concerning uncertainty were identified, specifically related to a baseline level of uncertainty, unpredictability of patterns, interdependence among individuals and organizational components, and personal limitations. A revised definition of organizational uncertainty is offered. The chapter concludes by reexamining definitions and theories presented in Chapter II. Most importantly, throughout the chapter, hypotheses that link organizational uncertainty to organizational components and processes are identified and illustrated with reference to the case.

Case Discussion

To understand uncertainty as experienced by individuals from different organizational components, an overview and summary of the case is presented. Specific findings from the case study suggest hypotheses about different aspects of organizational uncertainty.

Employees at the Hospital were experiencing changes and stressors. Changes included reorganization of managerial personnel, development of new programs, and regulatory changes. Also a new strategic plan was being developed, an acuity-based staffing system was being implemented, the nursing staffing model was being revised, and physicians were being hired to one of the speciality services. Despite these changes and challenges, participants viewed the Hospital as an "exceptional place to work." Fluctuations in patient acuity and volume generated considerable uncertainty, particularly for participants on the interpersonal level and at external boundaries of the organization. Technological changes, both the

knowledge of interventions and the equipment used in diagnosis and treatment, generated uncertainty. Specific systems, such as being a self-staffed unit, generated labor less uncertainty as reflected in the interview and the quantitative data.

Uncertainty was evident within each organizational component included in the study. For administrative personnel, uncertainty was more of a macro type. That is, uncertainty for administrators stemmed from the hospital's environment, competitors, and the market. In the upper management component, as seen in the responses of ADNSs, uncertainty was related to fluctuations in patient acuity and census, the hospital's environment, and limits they personally experienced. For front-line nursing unit managers, uncertainty centered on patient related fluctuations and personnel issues. Staff RNs experienced uncertainty primarily regarding the population base, as well as all other areas except patient care technology.

The extent of perceived communication was at least moderately high, as reflected in the NAIBQ data, for most participants from different organizational components due to newsletters within the organization, scheduled meetings and invitations to raise questions at meetings. Communication received conscious attention by administrators and unit mangers. NAIBQ data suggest that participants did not have perfect information for all needs. Unfortunately for those attempting to increase organizational communication, the R & T Balance Game results highlight the individual nature of informational needs. On the R & T Balance Game, almost all participants had different "balance" points for each of the items. Imbalances existed for members from each organizational component between the sufficiency of information and their ability to anticipate needed actions.

Imbalances between information and needs occurred regarding different topics for different organizational components. The pervasiveness of the

imbalances suggests that, as reported by the participants, some uncertainty was present at all times throughout the organization. The extent to which organizational uncertainty was specific for each individual was related to the specific requirements of the position, as well as to the personal limitations in acquiring and processing information. From this discussion, a hypothesis is suggested:

H1: *The degree of organizational uncertainty is related to the degree of imbalance between sufficiency of information deemed necessary and the situational need to make decisions or take actions.*

This imbalance, however, was not the only factor influencing the degree of uncertainty. Commercial insurance companies, federal government and providers contributed to organizational uncertainty through their effect on fiscal matters. Participants from all organizational components were cognizant of their limited control over the influence of these players. In addition, the participants were responsible for some aspect of the financial impact of their decisions despite having insufficient information regarding the impact of those decisions. Co-workers with variable interpersonal and technical skills further contributed to uncertainty experienced by participants. Personnel from other departments also had the potential to generate situations with unpredictable outcomes, thus contributing to uncertainty.

Patients also were major players in the organization. Patients were important as individuals with biophysical and psychological conditions and responses to treatment, and as a market with collective preferences and needs. The variations in the response to treatment and the fluctuations in the patient census contributed to organizational uncertainty. Across all components of the organization various aspects of patients that were unpredictable created an

imbalance between the information sufficiency and the situational need to make decisions. In this manner, patients contributed to the uncertainty experienced across organizational components. Also, components of the organization interact and influence one another (Morgan, 1986). In this way, organizational uncertainty is related to the actions of several different players involved with the organization.

Resource uncertainty, the imbalance between information insufficiency and need related to resources, was most often discussed in relationship to accessibility of information from others. Essentially, resource uncertainty was an inability to rely upon others for complete, accurate and timely information especially related to budgets, finances or availability of personnel. Similarly, technological uncertainty was related to the reliability and decision making of others or self regarding patient care and medical technology.

Interview data suggested that sources of organizational uncertainty grouped around factors, such as the degree of interdependence among organizational components. Within the case description, themes can be identified concerning sources of uncertainty. Evident in each organizational component were the elements of a baseline level of uncertainty, an unpredictability of patterns, a degree of uncertainty stemming from interdependence with others, and a personal limitation on abilities to interpret the organizational world.

Themes Concerning Organizational Uncertainty

Four themes concerning organizational uncertainty were extracted from the interview data. The themes centered on a baseline level of uncertainty, pattern unpredictability, interdependence, and personal limitations. The themes reflect broad issues and as such are not intended to describe mutually exclusive categories

Table 6.1 Primary Effects of and Responses Related to Themes Concerning Uncertainty.

THEMES ABOUT UNCERTAINTY	THEME RELATED PRIMARY EFFECTS	THEME RELATED PRIMARY RESPONSES
Baseline	Feeling of anxiety, stress or being overwhelmed	Standardizing procedures, adaptation, and flexibility in planning
Pattern Unpredictability	Indecision in making decision or taking action	Searching for information and options, adjusting to current information
Interdependence	Mistrusting, lack of control over actions of others	Being supportive of one another, formalization of relationships
Personal Limitations	Feelings of frustration or excitement	Personal coping strategies, gaining professional education, additional information search

or types of uncertainty. The existence of concurrent processes and sources of uncertainty precludes development of a linear model of organizational uncertainty as found at the Hospital. The primary effects of uncertainty on individuals and the primary methods used to cope differed by themes are summarized in Table 6.1. Inherent in each theme about uncertainty were the dimensions of insufficiency of data and situational needs related to both resources and technology. Distinctions between the themes are related to the differences in the sources of insufficiency of information and the type of actions or decisions needed.

Baseline Level of Uncertainty

While uncertainty has been described in the literature as associated with particular decisions or external events, participants said that uncertainty was part of the business and saw "uncertainty as kind of daily life." Participants reported that some aspect of uncertainty was present to some extent in all aspects of organizational life, and that living with uncertainty was a prerequisite to working at the Hospital. This uncertainty, which was a fact of life in the organization, was considered a constant or a baseline. The baseline level of uncertainty in health care organizations seems to arise predominantly from the continuous fluctuations in patient acuity and census. The fluctuations can be viewed as either an environmental element (Lachman, 1989), or as an internal variance impacting the technical core.

Studies have distinguished uncertainty as one characteristic of the organizational input from variability and instability as characteristics of the input (Overton, Schneck & Hazlett, 1977; Alexander & Bauerschmidt, 1987; Leatt & Schneck, 1981). All three characteristics were found to influence the work of the technical core. However, from the perspective of the participants, variability and instability were also characteristics of the input which contributed to their uncertainty. Fluctuations in patient acuity, as a source of uncertainty, consisted of the variability and the instability of patient conditions. These two characteristics of the input altered the information insufficiency and the situational needs, and thus contributed to the uncertainty they experienced.

Another indication of the existence of a baseline level of uncertainty was the reports in the interview that information was never adequate for a variety of decisions. Specifically,

H2: *The level of baseline organizational uncertainty will vary by individual, work unit and dominant source of organizational uncertainty.*

A baseline level of uncertainty can be thought of as residual uncertainty which gets transformed into risk by the organizational members (Stinchcombe, 1990).

For some participants, uncertainty contributed to the feeling of being stressed, as feeling overwhelmed, or anxiety. For other participants, a baseline level of uncertainty contributed to the enjoyment of the job, in that variety in the work, and the need to be alert and vigilant arose from uncertainty. In response to an uncertainty which was present at all times, participants learned to live with the uncertainty and came to accept, almost expect, some amount of uncertainty as part of their work life. A relationship exists between organizational uncertainty and emotions:

H3: *The experience of organizational uncertainty positively and negatively influences psychological status of organizational members.*

While steps were taken within the organization to reduce reliance on individuals, i.e., committees made decisions, reports were regularly scheduled, in an effort to minimize the uncertainty generated from making isolated decisions, participants conveyed a general sense that total elimination of uncertainty was unrealistic. The best that could be attained in a hospital would be a reduction of uncertainty to a comfortable level, and a reduction which did not negatively influence their decisions. Thus, the argument emerged that:

H4: *The level of efforts to reduce organizational uncertainty corresponds to the degree of discomfort experienced, and the degree to which decisions are affected by the uncertainty.*

To minimize the effect of fluctuations in patient acuity and census, systems were designed to buffer the staff RNs. Interestingly, these systems designed to buffer the technical core tended to be designed and implemented by the staff RNs rather than upper management or the administration. Procedures used to buffer the technical core (Thompson, 1967) were predominantly designed to attenuate the fluctuations inherent in the baseline level of uncertainty. The development of specific structural mechanisms added to the sense of control over the uncontrollable fluctuations and maximized gaining access to necessary information. Examples of standardization included the unit specific policies for flexible staffing, and having maternity patients call the hospital before leaving home.

H5: *To reduce organizational uncertainty, strategies for buffering the technical core are more likely to be implemented by the technical core than by administration; and these strategies are source-specific.*

Contrary to the organizational literature (Thompson, 1967), the development of these standardizations was carried out by the nursing staff, in other words, the technical core. Despite the increase in standardization, flexibility and adaptation to the overall situation was necessary.

H6: *To reduce organizational uncertainty, members adopt psychological and attitudinal perspectives which increase their perception and awareness of alternative decisions or actions.*

The dimensions of information insufficiency and situational needs regarding both resources and technology were evident in the baseline theme. Patient fluctuations created an imbalance between information and situational needs and was the source of the highest uncertainty across the different data sources. Wide

ranges in patient census and acuity made resource information valuable for only a short time, particularly for staff RNs and unit managers. Thus, the daily operational decisions, particularly staffing, frequently were made with inadequate information. The patients' physiologic and psychological responses to treatments, and the rapidity of innovations in medical technology further contributed to technological imbalances between information and situational needs. The baseline level of uncertainty was related to the degree of imbalance, giving additional credence to Hypothesis 1, which stated a relationship between uncertainty and the degree of imbalance.

Predictability of Patterns

Another theme concerning uncertainty included the notion of patterns and normalcy upon which predictions could be made. One staff RN defined uncertainty as "if something falls out of a pattern of what's supposed to happen." Another RN mentioned an irregular pattern as uncertainty. Uncertainty related to pattern unpredictability was mostly a technological uncertainty, since the patterns and the situations predominantly originated with the patient. Uncertainty emanating from an irregularity in an otherwise predictable pattern required that participants know what to do, and how to respond. Thus, the irregularities in patterns or departures from normalcy affected decision making. Although pattern predictability affects the predictability of outcomes, pattern predictability is not an assessment of outcomes. Participants, when asked, voiced the view that they knew what would happen, given a course of action or a known pattern.

The dimensions of information insufficiency and situational needs were relevant to pattern uncertainty. While monitoring the pattern provided information, the information was insufficient for the decisions related to the "new" pattern. The

unpredictability of the pattern also affected the situational needs for members. Because patterns provided information and defined the situation, uncertainty stemming from the unpredictability of patterns was more closely related to situational needs than to information insufficiency.

H7: *Organizational uncertainty increases as insufficiency of information increases due to pattern changes, and as situational needs change in accordance with the pattern unpredictability.*

Pattern unpredictability affected participants in that task accomplishment became delayed and patient care decisions became difficult. With regard to patient care and task accomplishment, pattern unpredictability can be viewed as a source of technological uncertainty. When a pattern was erratic or abnormal, participants faced some indecision. Several strategies to reduce pattern unpredictability were used. Participants maintained and accessed clinical or other expertise to improve knowledge of patterns, adapted to changes in patterns, and gathered information related to the pattern. To some extent the ability to perceive and interpret patterns related to either patients' trajectories or organizational strategies was based on having experience and expertise with the patients and the organization. Strategies included altering or delaying actions, or monitoring the situation by waiting and accumulating ongoing information about the pattern until a course of action was clearly preferable. The reduction of organizational uncertainty related to pattern unpredictability is likely to occur from at least one strategy:

H8: *Organizational uncertainty related to pattern unpredictability is reduced by identifying alternative courses of action based on professional and personal experience with pattern changes.*

Identification of alternative courses of action could not occur if members had not adopted different expectations of themselves and of the work environment as proposed in Hypothesis 6.

Unpredictability of patterns was seen across all organizational components. For example, the administration saw patterns in the development of selective contracting, and changes in that pattern created uneasiness regarding decisions related to bidding for those insurance contracts. To continue with the example, the altered pattern of contracting changed the patterns for unit managers regarding surveillance of physician's admissions for appropriateness. The example illustrates that patterns external to the organization may effect uncertainty across organizational components.

Nursing theorist Margaret Newman hypothesized that patterns are an important aspect of human health (1986). She defined pattern as having movement, diversity and rhythm. The pattern unpredictability found at the Hospital encompassed at least the characteristics of movement and diversity. Participants could not predict the direction of the movement of some patterns, i.e., the desirability of nurse midwife deliveries. The diversity, i.e., chemotherapy patients' temperature changes, or other patterns precluded anticipating the position in the pattern at a given time in the future.

The identification of pattern unpredictability as one theme concerning uncertainty is also consistent with a cognitive or process approach to understanding uncertainty (Duncan, 1972; Jauch & Kraft, 1986). If uncertainty is an interpretation, then some interpretative scheme is necessary. In a complex environment, with multiple sources of information and the need for rapid decision making, the reliance on patterns would be an efficient means of interpretation.

Interdependence

Providing care requires the coordination of efforts of members from diverse departments within the organization. Members are relied upon to cooperate in the coordination of work necessary for providing care. In an acute care setting, events may rapidly develop which require an immediate response of a team, thus accentuating an interdependence. Uncertainty emanating from interdependencies was really an issue of "people interfacing who have no concept of what your job is", as one RN put it. Implicit in this statement was the notion that an insufficient understanding existed about the work of those with whom coordination was expected. The lack of understanding resulted in both unreliability and unpredictability of interactions and subsequently a lack of trust.

Although the R & T Balance Game and NAIBQ did not measure interdependence, interdependence can be inferred from the imbalances between information inadequacy and action needs in areas that involved other departments or individuals. A different type of interdependence existed between the organization and constituents in its task environment, specifically, payors, Medicare, Medicaid, lego-political bodies, and patients, as exemplified by the financial relationships.

The interdependence between the organization and its constituents was an issue for the administration, yet these interdependencies had an effect on direct care givers, in particular on medical and nursing care decisions and priority setting. Interdependence had the most visible effect on patient care, via decisions regarding patient care. While interdependence is easily recognizable among hospital departments, interdependencies that existed at the organizational boundary also could be seen throughout the organization. The difficulties in establishing a contract for providing maternity services to patients from community clinics (the

uncertainty in interdependence between the Hospital and clinics) became difficulties for unit managers and staff RNs in anticipating interdependencies with other agencies providing social services to the same patients. With regard to interdependence, resource uncertainty (skill and motivation of personnel) and technologic uncertainty (which services to provide) are intertwined.

One explanation for the importance of interdependencies is the highly sequential and reciprocal nature of the internal interdependencies (Thompson, 1967). The relationship predicted by Thompson between interdependencies and uncertainty is discussed more fully below as a theoretical consideration. Alternatively, interdependence can be viewed as a consequence of providing a service that requires interaction between provider and patient (McCallulm & Harrison, 1985). Regarding interdependencies, again the data suggest the importance of the following hypothesis, which states a relationship between uncertainty and the interaction among organizational components.

H9: *Organizational uncertainty increases as the extent of interaction among components increases and as the extent to which those interacting components lack mutual trust.*

Kanter (1977) in discussing uncertainty, which she defined as the reliance on personal discretion, hypothesized a direct relationship between the degree of uncertainty and the reliance on personal trust. In a health care organization, all clinical judgments and interventions can be viewed as decisions based on personal discretion; in other words, uncertainty. In the interview data, interdependence also was described in relationship to a lack of trust in professional abilities and in personal competence, as hypothesized by Kanter (1977). The personal discretion of clinicians, both RNs and MDs, added to the complex relationships among

individuals who needed each other for accomplishing their tasks.

Kanter (1977) further suggested that alignment of mid-level mangers with the powerful top administrators was one mechanism to decrease uncertainty, since individuals with power have control over resources. In the Hospital, only a few participants mentioned alignments, specifically related to implementing programs. Such alignments might be interpreted as the creation of interdependencies to maximize access to resources or information about resources, and thus to reduce resource uncertainty.

However, decreased uncertainty as perceived by staff RNs was associated with increased independence, particularly of unit components, rather than centralized decision making as predicted by Thompson (1967). The difficulties faced by unit managers in implementing the acuity based staffing system could be interpreted as resulting from the tension between interdependence between departments and the hospital as a whole, and the need for some degree of independence for the nursing units. Considering the interaction among organizational components, the following can be predicted:

H10: *The degree of organizational uncertainty is related to the degree of discretion permitted by the work unit or the organization.*

The effects of uncertainty concerning interdependence were different from other effects. Non-trusting attitudes resulted from the unreliability and unpredictability of others. To overcome or compensate for uncertainties arising from interdependence among organizational components, team esprit and interpersonal caring were nurtured within the units and in the organizational culture. To reduce the unreliability of interactions across departments, formalization occurred. That is, those who experienced the uncertainty stemming

from interdependence created methods for reporting information to one another. Other strategies to reduce uncertainty related to issues of interdependence included building in systems to standardize coordination of efforts, formalizing actions and expectations, occasionally being assertive, and supporting one another.

H11: *Organizational uncertainty is reduced by increased coordination and formalization of relationships within and across layers of the organization.*

Hypothesis 11 is an extension of work concerning uncertainties inherent in the patient, and the need for coordination of work (Argote, 1982; Alexander & Bauerschmidt, 1987; Alexander & Randolph, 1985). Together Hypotheses 10 and 11 reflect the diverse and paradoxical strategies used to reduce organizational uncertainty.

The situational needs of uncertainty related to interdependence most often were related to resources, i.e., supplies from others or emotional support. But the information insufficiency most often was related to technology, i.e., variations in professional practice or diagnostic test results. The riskiness of technological decisions was affected by interdependence, specifically, the personnel issues. Thus, uncertainty concerning interdependence was exemplified by imbalances between information insufficiency and situational needs for both resource and technology decisions.

Personal Limitations

The fourth theme concerning uncertainty pertains to personal limitations on being able to predict or anticipate what would happen. Personal limitations were related to lack of information, and a limited ability to see into the future, such that "unexpected things happen" and individuals "cannot forecast the future." The

personal limitations contributing to uncertainty might more aptly be called human limitations. Despite seeking or having information and carefully assessing risk, interdependencies and pattern unpredictability strained rational decision making capabilities of individuals, such that:

H12: *Organizational uncertainty is related to an inadequate ability to make decisions based on the perception and interpretation of information deemed relevant to the position and work of the organization.*

The effects of personal limitations were seen most directly through decision making. Needing to make decisions with insufficient information resulted in feeling unsure of oneself. Personal limitations also led to specific effects and responses. When individuals felt that they could not anticipate their work world, they felt either frustration or excitement. The emotional response to uncertainty, as stated in Hypothesis 3, also applies to personal limitations. In addition:

H13: *Organizational uncertainty is reduced by increasing the members' level of self-confidence and professional competency within the organization.*

The strategies used in relationship to uncertainty related to personal limitations focused on adjusting to human limitations and limitations resulting from insufficient information. Since the personal limitations were connected to insufficient information of some sort, the individual's natural response was to seek the specific information. More specifically, taking advantage of the opportunities which arose and developing an attitude of acceptance were coping strategies. Participants responded to organizational uncertainty by developing an accepting attitude and by coping with their own limitations. For example, staff RNs sought

special education to improve their skills.

Uncertainty related to personal limitation was evident across all organizational components and encompassed the dimensions of information insufficiency and situational needs. While the dimension of information insufficiency was clearly present in personal limitations, the situational needs that contributed to the personal limitations were more personal in nature. In particular, the need for participants to reduce their own anxiety or concerns was a situational need in some instances. For example, one staff RN wanted information from administration regarding the fiscal soundness of the organization although this information would not alter her decision to work at the Hospital. This shows that individuals wanted some information about the context of their work although no decisions or actions were required of them.

Limitations on Uncertainty

Two boundaries on uncertainty were perceived by organizational members. One boundary was time. Time frames altered the awareness of uncertainty. Trends were more certain and predictable than were more immediate changes and fluctuations. The time frames within which there was some certainty varied by organizational level, with staff RNs having time frames for predictability that tended to be weeks or months. In contrast, administrators' time frames for predictability were daily and one year.

The existence of time boundaries on uncertainty and the different range on the time frames for different individuals in the organization is to be expected since different parts of the organization respond over different time spans (Stinchcombe, 1990). For example, staff RNs and unit managers responded to fluctuations in patient census within hours, whereas administrators responded to trends in census

over a period of months. Information is never perfect but each individual has a notion of what is optimal and necessary given the situation. The value of information is a matter of length of time for which the information will be accurate and the time within which information is obtainable. In Chapter 2, the temporal force was discussed as a characteristic of information. The relationships between time and uncertainty can be stated as:

H14: *The degree of organizational uncertainty corresponds to the degree of decrease in the length of time for which a set of situational needs is relevant, or for which the available information is accurate and relevant.*

The second boundary on organizational uncertainty was variance. One aspect of the knowable and predictable world is the limitations of reasonable and extreme variations. An example of a limit on the variations is the number of beds on the units. However, the number of discharges and admissions to those beds can vary widely. The often told "horror stories" within any organization are stories of extremes and rarely experienced events. Staff RNs and managers detailed such stories in their interviews. These stories were examples of different ranges of variation they experienced. Such stories of unusual admission rates, high death and birth rates within a short time, and of heroic or dangerous performance all assist in creating a boundary around uncertainty within that organization.

The organizational member develops a mental image of the range within which to expect variation. This learned range of variation becomes an assumed limit on uncertainty within that work site. The telling and interpretation of such stories also may constitute an organizational interpretation process. At the Hospital, critical events were known to individuals from all levels. The shared knowledge thus provided some uniformity to schemes for interpretation of

uncertainty concerning events.

At the organizational level probabilities associated with defined risks were not perceived as probabilities, but are perceived as variance. That is, a particular "average" is expected and a range of toleration around that "average" is developed. For example, the average number of deliveries per month is 120 but that may range from 110 to 130. That translates into 4 deliveries per day, or more than one per shift. The probability could be 90 percent that one delivery will occur on any one shift, but the variance (or range, more precisely) could be from 5 to 0 deliveries per shift. The decisions regarding staffing in acute care settings have been based on the probabilities, or the average, not the uncertainty, which is based on the variance, or in other words, the fluctuations. The change to acuity based staffing can be interpreted, in part, as a shift to staffing based on a variance. In this way, such a system may reduce uncertainty.

Small variances experienced at the unit and clinician levels can alter the perceived balance between information insufficiency and situational needs. Changes within the range of variance create new or different requirements for decisions and actions. For this reason, previous definitions of uncertainty which centered on assignment of probabilities were incomplete. High variances may originate from simultaneously experiencing different sources of uncertainty. As discussed regarding the different themes, organizational uncertainty decreases the sense of control members have over practice and work. In professional organizations, the lack of control over practice is an important effect of organizational uncertainty on individuals. An additional hypothesis is suggested:

H15: *The greater the organizational uncertainty due to the diversity or number of sources, the greater the perceived lack of control over performing one's work role.*

Revised Definition of Organizational Uncertainty

Organizational members have expectations about what might occur in given situations but they also are cognizant of the tentativeness inherent in all situations. In addition, factors which have the potential to alter the expectations or the chain of events in the situation generally are not under the direct control of the individual. The inherent tentativeness becomes exaggerated as the variance in the pattern becomes greater, making impossible the formation of new expectations about some element of the situation which is particularly germane to the member's work. In other words, organizational uncertainty is an awareness that a pattern, plan or trajectory could be altered from an expected course due to factors beyond the control of the individual, and that some relevant aspect of the potentially 'new' pattern, plan or trajectory cannot be specified due to either insufficient information or large variance in potential patterns. In short, the degree of organizational uncertainty is related to the degree to which the variance in the situation deviated beyond a range considered normal, such that probabilities cannot be assigned.

This definition intentionally does not focus on outcomes. Unknown outcomes are a consequence of organizational uncertainty, not an inherent characteristic or dimension of uncertainty. Nor does the definition focus on the assignment of probabilities, which, according to Knight (1929), is more appropriately called risk and was not reflected in the data. The revised definition stems from the experience of uncertainty rather the *a priori* dimensions as proposed in Chapter 2. Also, the definition is broad enough to encompass the themes concerning uncertainty described above. The diverse sources of uncertainty reflected in the themes concerning uncertainty were consistent with the suggestion that uncertainty has multiple sources in health care (Strauss et al, 1985).

Theoretical Considerations

Existing theories and work regarding uncertainty can be reexamined in light of the expanded understanding of organizational uncertainty gained from the case study. Definitions of uncertainty, interdependence and buffering of the technical core, as well as organizational factors influencing insufficiency of information and gender, all need to be considered in light of the study results.

Definitions and Types of Uncertainty Revisited

In Chapter II, definitions and characteristics of uncertainty from the organizational literature focused on the interpretation of current events and the prediction of future events. The types of uncertainty as described by Milliken (1987), namely state, effects and response uncertainty, did not convey the entire scope of uncertainty for the participants at the Hospital. Participants viewed the state of events, the effects of actions and the responses of others as never totally knowable. In essence, participants expected imperfect knowledge about the state of the environment, the effects of their actions and responses to those actions. The participants seemed not to be concerned about these types of uncertainty and conveyed a confidence in knowing what actions would lead to which types of outcomes, in a generic sense. In essence, state, effect and response uncertainty contributed to the baseline level of uncertainty they experienced and seemed to expect as part of working in a health care organization.

Participants at the Hospital did not consciously divide their world and experiences into environmental, resource and technological uncertainty; although upon query, participants did identify sources of uncertainty from each of these areas.

Implicit in the definitions of uncertainty offered by participants were the state, effect, and response types of uncertainty predicted by Milliken (1987). However, the participants' expression of these types of uncertainty were slightly different as reflected in their definitions of uncertainty. The most common definition of uncertainty was "not knowing what's happening", which corresponds to state uncertainty. Another definition was, in the words of one participant, "Taking some action that you're not sure will work." This definition could be interpreted as response uncertainty, as might those definitions that focused on a perceived lack of control over the future. Some participants defined uncertainty as not knowing how to respond to others. From the perspective of the participants, uncertainty had a more personal connotation than implied by types described by Milliken.

Other types of uncertainty discussed in Chapter II were resource and technological uncertainty. These were presented as being composed of two dimensions, information insufficiency and situational needs. The usefulness of these two dimensions in explaining different sources and effects of and responses to uncertainty suggest some validity to the conceptualization of organizational uncertainty as having these two dimensions. Also, resource uncertainty and technologic uncertainty were pervasive throughout the discussion of themes concerning organizational uncertainty. Interestingly, the distinction between resources and technology was not clearly denoted in the experience of the participants as implied by theoretical statements of Thompson (1967) and others.

Interdependence and Buffering Revisited

As discussed in Chapter II, in loosely coupled organizations members from different organizational components perceive different information and have different cognitive interpretative schemes and situational needs. Also loose

coupling of work units and organizational layers is needed for having the flexibility in responding to uncertainties, such as fluctuations in patient acuity and census. However, loose coupling decreases information exchange, and interpersonal and interdepartmental trusting, which in turn increases the organizational uncertainty, related to interdependencies.

Thus, a paradoxical situation exists within the organization; flexibility and interdependence are needed to respond to the baseline level of uncertainty and pattern unpredictability, yet formalization and routinization are needed to reduce uncertainty related to interdependence. The solution to the paradox in the Hospital was to develop closer relationships without increasing interdependence. For example, the response to interdependence, "support one another," was a result of loose coupling between individuals.

The diversity of strategies described by the participants suggests that multiple strategies are necessary for managing organizational uncertainty and sometimes are used simultaneously. While development of procedures was seen as one strategy for reducing uncertainty, flexibility in both attitude and decision options was an important and prevalent strategy for dealing with the organizational uncertainty. In an organization where change is normal and constant, and fluctuations occur hour by hour, formalization and standardization lags behind the changes. Thus, having flexibility in the selection of management response strategies with the immediate uncertainties is paramount.

Thompson (1967) predicted that the technical core is buffered from environmental influences by the administrative core. At the Hospital, those providing the services were not "buffered" by the administration from the environment, in the sense of being protected from the environmental influences (Meyer & Scott, 1983). RNs and the MD were not only highly cognizant of changes

in the economic and political environment of the organization, but in fact, were required to alter their practices in some ways because of such changes. In addition, many of the strategies for coping with organizational uncertainty were designed and implemented by unit managers and staff, rather than by the administration. Buffering of the technical core from the environment by the administration was not reported by the participants. Based on Hypothesis 10, the level of participation by the technical core in creating and implementing buffering strategies can be predicted. However, strategic planning occurring at the Hospital could be interpreted as part of preparing to protect the technical core from the turbulence and competition in the hospital's environment. Thus, buffering occurs at different components within the organization, but the focus and mechanisms used differ.

Rationality in decision making presupposes having adequate information for the decision. The quantity and relevance of information necessary for a decision was often perceived by the participants as lacking. Thus, the assumption of rationality which underpins the buffering hypothesis of Thompson is called into question.

Gender

The majority of the participants (85 percent) were female. In fact, the only males were the physician, the hospital administrator, the chief financial officer, and one staff RN. This distribution of men and women within the hierarchy of acute care facilities is fairly common and has relevance to the description of organizational uncertainty revealed in the case study and in particular to the strategies used to deal with organizational uncertainty.

Research on the influence of women workers on the organization (Kanter, 1977; Lunneborg, 1990), on women as learners (Belensky, Clinchy, Goldberger &

Tarule, 1986), and on women's ethical development (Gilligan, 1982) all suggests that women are more attentive to interpersonal processes than are men. Data from the Hospital regarding the extent to which relationships were an important factor in uncertainty raises the question of whether the predominance of women in health care organizations affects perceptions and thus the experience of organizational uncertainty in health care organizations.

The traditional focus in the organizational literature on the development of standardization, routinization and formalization would seem to present only partial solutions to the uncertainties experienced by the organizational participants in the Hospital. That structural strategies were balanced with interpersonal and intrapersonal strategies is more consistent with a feminine approach to problem solving and decision making.

Summary

The chapter began with a summary of the case based on an integration of data from the different sources. An interpretation of the data was presented, hypotheses were suggested and illustrated using the case data. From the case summary, four themes related to uncertainty were identified and then discussed in detail. Additional hypotheses were derived from the discussion of each theme. Next, two major constraints on the experience of organizational uncertainty, specifically time and variance, were presented. A revised definition of organizational uncertainty was offered. The chapter concluded with a discussion of theoretical considerations based on the definitions, types and theories presented in Chapter II.

Chapter VII begins with a listing by source, effects, strategies and types of

uncertainty of the hypotheses generated in this chapter. Limitations of the study are acknowledged. Both practice and research implications are discussed. The chapter summarizes the study and the major findings.

Chapter VII: SUMMARY AND CONCLUSION

The purpose of this research was to describe organizational uncertainty as experienced by individuals from various components within one acute care hospital. From a review of organizational literature, a conceptual framework was developed in Chapter II, and the framework guided the selection of the research methodology. The case study method was described in detail in Chapter III. The analysis plan was explained in Chapter IV, and results of the analysis were presented in Chapter V. In Chapter VI, a summary of the case findings was presented, and four major themes regarding organizational uncertainty were discussed. In addition, further theoretical considerations were discussed. Throughout Chapter VI, hypotheses were stated and illustrated using the case data.

This chapter presents the hypotheses generated in the previous chapter, grouped by sources and effects of, and strategies used to reduce uncertainty. Next, limitations of the study are acknowledged. Based on the study results, both practice and research implications are identified. The chapter concludes with an synopsis of the study and the major findings.

Summary of Hypotheses

One purpose of this study was to identify different factors pertinent to the experience of organizational uncertainty. In the preceding chapter, numerous hypotheses were proposed based on factors evident in the data from the case study. Those hypotheses are listed below, and grouped by statements regarding dimensions of organizational uncertainty, sources of uncertainty, effects of uncertainty, strategies to reduce uncertainty, and uncertainty regarding organizational members.

Hypotheses regarding dimensions of organizational uncertainty

H1: *The degree of organizational uncertainty is related to the degree of imbalance between sufficiency of information deemed necessary and the situational need to make decisions or take actions.*

H2: *The level of baseline organizational uncertainty will vary by individual, work unit and dominant source of organizational uncertainty.*

H7: *Organizational uncertainty increases as insufficiency of information increases due to pattern changes, and as situational needs change in accordance with the pattern unpredictability.*

H12: *Organizational uncertainty is related to an inadequate ability to make decisions based on the perception and interpretation of information deemed relevant to the position and work of the organization.*

H14: *The degree of organizational uncertainty corresponds to the degree of decrease in the length of time for which a set of situational needs is relevant, or for which the available information is accurate and relevant.*

Hypotheses regarding sources of uncertainty

H8: *Organizational uncertainty related to pattern unpredictability is reduced by identifying alternative courses of action based on professional and personal experience with pattern changes.*

H9: *Organizational uncertainty increases as the extent of interaction among components increases and as the extent to which those interacting components lack mutual trust.*

H10: *The degree of organizational uncertainty is related to the degree of discretion permitted by the work unit or the organization.*

Hypotheses regarding effects of uncertainty

H3: *The experience of organizational uncertainty positively and negatively influences psychological status of organizational members.*

H15: *The greater the organizational uncertainty due to the diversity or number of sources, the greater the perceived lack of control over performing one's work role.*

Hypotheses regarding strategies to reduce uncertainty

H4: *The level of efforts to reduce organizational uncertainty corresponds to the degree of discomfort experienced, and the degree to which decisions are affected by the uncertainty.*

H5: *To reduce organizational uncertainty, strategies for buffering the technical core are more likely to be implemented by the technical core than by administration; and these strategies are source-specific.*

H6: *To reduce organizational uncertainty, members adopt psychological and attitudinal perspectives which align their increase their perception and awareness of alternative decisions or actions.*

H11: *Organizational uncertainty is reduced by increased coordination and formalization of relationships within and across layers of the organization.*

H13: *Organizational uncertainty is reduced by increasing the members' level of self-confidence and professional competency within the organization.*

Within the literature on organizational uncertainty hypotheses are implied concerning uncertainty and different aspects of the organization. The implicit hypotheses can be compared to those stated above. Having identified specific factors pertaining to organizational uncertainty, understanding connections among the factors aided in understanding whether a particular factor was relevant to uncertainty. The hypotheses set out above, which were derived from the results of the case study, make explicit only those relationships which were evident within the case.

Limitations of the Study

While the definition of organizational uncertainty derived from the case data may have intuitive appeal and seem applicable to other organizations, the results cannot be generalized beyond the one hospital studied. Confidence in the

generalizability of the results would be strengthened by further research, drawing upon a larger sample of organizations, nursing units, and individuals. In future studies, the inclusion of individuals from similar organizational levels but from different departments would add to the generalizability of the findings. In other words, a broader representation of organizational members would enrich the data on uncertainty.

At the time of data collection, the Hospital was undergoing major internal changes. Some data in the interviews reflected these changes, although a systematic assessment of the change, as described by Seashore, Lawler, Mirvis and Cammann (1983), was not included in this study. The extent to which those changes were unique to the Hospital is unknown. Thus, some factors associated with organizational uncertainty at the hospital may not be found at other hospitals. Replication of the study could clarify this issue.

Participants described examples in which their decision making was influenced by the uncertainty they experienced. These stories were examined for data regarding only sources and effects of uncertainty. The study was not designed to identify relationships between organizational uncertainty and any organizational outcomes, such as patient outcomes. The results suggest that organizational uncertainty had an effect on decision making, but the impact of the different decisions cannot be known through this study.

Implications and Recommendations

From the results of the study of organizational uncertainty in an acute care hospital, several implications for nursing and hospital administration become apparent. Also, future research can be informed by this study.

Practice

From the results, five major implications for administration of hospitals and nursing services are cautiously drawn below. First, across all organizational layers, members seemed to expect some amount of uncertainty as part of their life within the organization. The total elimination of organizational uncertainty is not only unrealistic, but perhaps undesirable. Experiencing organizational uncertainty contributed to some efforts to make organizational systems more efficient and to the professional development of individuals. In short, in moderation organizational uncertainty may be viewed as healthy for the organization.

Second, patient care decisions of members from each organizational layer seem to be affected by organizational uncertainty. In particular, effects of uncertainty on care providers can have consequences for patient care via decision making. The results suggest that nursing practice is influenced by the organization as a practice setting. Unit independence, formalization of relationships among departments, and methods to communicate information need to be considered as ways to minimize the potential effect of organizational uncertainty on patient care outcomes.

Third, the insufficiency of information of different organizational members needs to be carefully considered. The lack of an agreement on the NAIBQ across organizational components regarding the degree of uncertainty for different items cannot be ignored. The diversity of perceived informational needs reflected in the lack of agreement underscores the difficulty in providing sufficient information to organizational components and across the organization as a whole. Decreasing the information insufficiency requires efforts from all organizational members and may require creative methods of making a broad base of information accessible. The hospital studied had minimal computerization of information. While some of the

organizational uncertainty related to interdependence might have been diminished by computerized systems, the range of individual perceptions of the need for information is likely to remain.

A fourth issue concerns the personal ways in which organizational uncertainty is experienced. An unanticipated, but not surprising, finding was the emotional element associated with organizational uncertainty. Stress, anxiety, and frustration, as well as excitement, were associated with uncertainty in the minds of the participants. That emotions may be involved suggests that attention to psychological process as well as rational process may be required to attenuate the effects of organizational uncertainty. That the emotional effect of organizational uncertainty seemed to vary with organizational layers, attention may need to focus on both gender issues and role expectations in different organizational layers.

Fifth, interdependencies are critical in the creation and reduction of organizational uncertainty. Whether interdependencies that are necessary for providing health care contribute to uncertainty or to synergies within the organization depends upon structural arrangements and interpersonal relationships.

One additional practical issue stems from the trend in health care organizations and in nursing departments, in particular, to establish a shared or self-governance body. The additional managerial type responsibilities that accompany such innovations have the potential to alter markedly both the situational needs and the information insufficiency for staff RNs.

Research

Results from this study can be used to set forth a research agenda for the study of organizational uncertainty in an acute care hospital. The specific recommendations concern the development of theory and of reliable measures, and

the uniqueness of health care organizations.

First, further theoretical development of the concept of organizational uncertainty is needed. Explication of additional relevant variables and their inter-relationships would contribute to a model of organizational uncertainty which includes causal paths to different organizational outcomes. To hypothesize about the effects of uncertainty on patient outcomes, studies are needed which specify the processes by which decision making, as it occurs in daily organizational life, is affected by uncertainty. Also, linkages between clinical and administrative decisions and between managers' decisions and patient outcomes need to be explicated. Repeating this study in other acute care hospitals organizations with different administrative styles, missions, and strategic plans would provide insights into the relationship of organizational uncertainty with other organizational variables. The concepts of pattern identification and pattern unpredictability may be useful to future studies of organizational uncertainty.

Second, a valid and reliable measure of organizational uncertainty is needed. Current measures of uncertainty do not encompass the factors identified in this study, are not designed to be used throughout the organization, and vary among studies. Having a standardized measure of organizational uncertainty would be helpful in testing the hypotheses set forth in Chapter IV. Additional research is needed to clarify the relationships between uncertainty and patient outcomes, and the effectiveness of strategies used to deal with uncertainty identified in this study.

The last research recommendation is to identify the extent to which organizational uncertainty as experienced in acute care hospitals differs from organization uncertainty as experienced in other types of service organizations. As mentioned in Chapter II, the professional and bureaucratic nature of the health care organization presents some caveats for studying and interpreting organizational

phenomena. Understanding the extent to which organizational uncertainty is business or industry specific would contribute to the development of an overall theory of organizational uncertainty.

Conclusion

The purpose of this case study was to describe organizational uncertainty as experienced by individuals across different organizational components within an acute care hospital. A definition of organizational uncertainty was developed, which included the dimensions of insufficiency of information and situational needs for decision making. Imbalances between these dimensions were viewed as contributing to uncertainty regarding resources and technology. Both quantitative and quantitative case study data were used to isolate factors associated with organizational uncertainty in one acute care hospital.

Specific sources of uncertainty, effects of uncertainty, and strategies used to reduce uncertainty were identified in interviews with participants. Strategies to reduce or moderate organizational uncertainty encompassed both personal and organizational strategies. Organizational uncertainty affected individual decision making and feelings. Four themes regarding organizational uncertainty were identified related to sources of organizational uncertainty. Throughout the discussion of the results, the relevance of the dimensions of information insufficiency and situational needs for decisions or actions was evident. Numerous hypotheses were stated based on evidence from the case study.

One key finding was that the high degree of interdependence among organizational components and departments contributed considerably to organizational uncertainty. Strategies to reduce uncertainty related to

interdependencies often were developed by the component experiencing the uncertainty, rather than by the administrative core. Furthermore, the results suggest that uncertainty within one organizational component may be experienced by individuals across different organizational components. Thus, this case study augments and challenges some of the existing literature about organizational uncertainty and provides a foundation for further knowledge and management of organizations.

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Appendix A

PERCEPTIONS OF UNCERTAINTY-INTERVIEW

I have some questions about your individual and collective perceptions of the environment of the organization and the functioning of this institution.

1. Overall, how accurately do feel you are able to predict or anticipate what will happen in your job?

What affects your ability to make accurate predictions related to your job?

In what ways does your "predictive ability" affect your decisions and actions?

2. What aspects of your work have the highest degree of uncertainty?

What contributes to the uncertainty?

What can you, or do you do, about uncertainty?

In your position, how would you define uncertaity?

3. What in particular can you not count on in doing your job?

How does the lack of that affect your decisons and actions?

4. In the past three to six months, has there been an important committee, or task force convened to focus on an aspect of either the hospital's resources or patient services?

Thinking about that committee, what triggerd its formation?

In what ways, if any, might the report/work of that committee affect your decisions or actions related to [the issues being addressed by that group].

5. The next set of questions focuses on "resources" and your job.

What would be an example of a typical situation in which you needed to make a decision or take actions about resources?

How do you gauge if the information you have is adequate?

How do you gauge the urgency for making a decision or taking action?

To what extent is the need for information about resources situation specific, time frame specific?

What mades decisions or actions involving resouces "risky"?

6. The next set of similar questions focuses on patient services technology and your job.

What would be an example of a typical situation in which you needed to make a decision about technology related to patient services?

Again, how do you gauge if the information you have is adequate?

And, how do you gauge the urgency for making a decision or taking action?

To what extent is the need for information about patient services technology situation specific, and time specific?

What mades decisions and actions involving technology "risky"?

7. What, if anything, in particular in the community is currently affecting this organization?

What major factors are generally considered in making decisions about those issues?

8. How would you describe or characterize the patients/consumers served by this organization?

What types of difficulties are most often experience in providing or planning for their care?

9. In what ways is information routinely (if at all) exchanged between:

a) the hospital admininstration and nursing management?

b) the hospital adminstration and the maternity unit?

c) the maternity unit management and the nursing staff?

c) the nursing staff and medical staff on the maternity unit?

d) the medical staff and the hospital adminstration?

e) the medical staff and nursing mangement on the maternity unit?

Appendix B

NAIB QUESTIONNAIRE

The following questions deal with topics related to your work and your perceptions of your work environment. Your responses will be anonymous.

1. Considering decisions or actions that are normally part of you work, how sufficient is the information you have regarding each of the following? Please feel free to add other types of information important to your work.

1=Completely Sufficient
2=Fairly
3=Somewhat sufficient
4=Barely sufficient
5=Not at all sufficient
9=Not relevant

Medical Staffing	1	2	3	4	5	9
RN staffing	1	2	3	4	5	9
Other staffing	1	2	3	4	5	9
Operating budget	1	2	3	4	5	9
The information received from other parts of the hospital	1	2	3	4	5	9
Patient satisfaction	1	2	3	4	5	9
New medical equipment	1	2	3	4	5	9
Payor sources	1	2	3	4	5	9
Types of services available for your patients	1	2	3	4	5	9
Daily census fluctuations	1	2	3	4	5	9
Current patient acuity	1	2	3	4	5	9
Other,_____	1	2	3	4	5	9
Other,_____	1	2	3	4	5	9
Other,_____	1	2	3	4	5	9

2. To what extent would you say there is communication between the groups specified in each of the following pairs regarding the provision of patient services ?

1=To a great extent
2=To a fair extent
3=To some extent
4=To a small extent
5=Not at all
9=Can't judge

Between administration and your nursing unit management	1	2	3	4	5	9
Between physicians and your nursing unit mangement	1	2	3	4	5	9
Between RNs on your unit and your nursing unit management	1	2	3	4	5	9
Between RNs on your unit and admitting physicians	1	2	3	4	5	9
Among staff RNs on your unit	1	2	3	4	5	9
Between RNs on your unit and ancillary personnel	1	2	3	4	5	9
Between RNs on your unit and patients on your unit	1	2	3	4	5	9
Between hospital administration and admitting physicians	1	2	3	4	5	9

3. In your opinion, how sufficient is the information you receive from administrative personnel regarding each of the following?

1=Completely Sufficient
2=Fairly
3=Somewhat sufficient
4=Barely sufficient
5=Not at all sufficient

General fiscal resources	1	2	3	4	5
General personnel resources	1	2	3	4	5
Consumer demands	1	2	3	4	5
Patient needs	1	2	3	4	5

4. In your opinion, how sufficient is the information you receive from managers of nursing units regarding each of the following?

1=Completely Sufficient
2=Fairly
3=Somewhat sufficient
4=Barely sufficient
5=Not at all sufficient

General fiscal resources	1	2	3	4	5
General personnel resources	1	2	3	4	5
Consumer demands	1	2	3	4	5
Patient needs	1	2	3	4	5

5. To what extent are you able to anticipate each of the following?

1=To a great extent
2=To a fair extent
3=To some extent
4=To a small extent
5=Not at all

Work problems and needs of your co-workers	1	2	3	4	5
Revenue changes	1	2	3	4	5
Manpower changes	1	2	3	4	5
Patient population changes	1	2	3	4	5
Work flow changes	1	2	3	4	5
Medical technology changes	1	2	3	4	5
Census changes	1	2	3	4	5
Patient acuity changes	1	2	3	4	5
Reimbursement changes	1	2	3	4	5
Expenditure changes	1	2	3	4	5
Patient care policy changes	1	2	3	4	5

6. Considering the decisions or actions that are normally part of your work, to what extent do you feel you need to be able to anticipate each of the following?

1=To a great extent
2=To a fair extent
3=To some extent
4=To a small extent
5=Not at all
9=Not relevant

Work problems and needs of your co-workers	1	2	3	4	5	9
Revenue changes	1	2	3	4	5	9
Manpower changes	1	2	3	4	5	9
Patient population changes	1	2	3	4	5	9
Work flow changes	1	2	3	4	5	9
Medical technology changes	1	2	3	4	5	9
Census changes	1	2	3	4	5	9
Patient acuity changes	1	2	3	4	5	9
Reimbursement changes	1	2	3	4	5	9
Expenditure changes	1	2	3	4	5	9
Patient care policy changes	1	2	3	4	5	9

7. To what exent do you have to take into account the work needs of others in your routine activitiess? (circle one)

Very great amount	Great amount	Fair amount	Not much	Not at all
1	2	3	4	5

8. To what extent are most of the people you work with able to anticipate your work problems and needs? (circle one)

To a very great extent	Great extent	Fair amount	Not much	Not at all
1	2	3	4	5

9. How adequate for your work needs is the information you normally receive from each of the following?

1=Completely
2=Fairly
3=Somewhat
4=Barely
5=Not at all
9=Not relevant

Admitting physicians	1	2	3	4	5	9
RNs on this unit	1	2	3	4	5	9
Your nursing unit management	1	2	3	4	5	9
Patients on this unit	1	2	3	4	5	9
Administrative personnel	1	2	3	4	5	9
Ancillary personnel	1	2	3	4	5	9

10. Considering the work you normally do, to what extent do you feel you must make decisions or take actions regarding or related to each of the following?

1=To a great extent
2=To a fair extent
3=To some extent
4=To a small extent
5=Not at all
9=Not relevant

Work problems and needs of your co-workers	1	2	3	4	5	9
Revenue changes	1	2	3	4	5	9
Manpower changes	1	2	3	4	5	9
Patient population changes	1	2	3	4	5	9
Work flow changes	1	2	3	4	5	9
Medical technology changes	1	2	3	4	5	9
Census changes	1	2	3	4	5	9
Patient acuity changes	1	2	3	4	5	9
Reimbursement changes	1	2	3	4	5	9
Expenditure changes	1	2	3	4	5	9
Patient care policy changes	1	2	3	4	5	9

11. Overall, to what extent can you predict the outcome of your decisions or actions taken at work? (Circle one)

Very great amount	Great amount	Fair amount	Not much	Not at all
1	2	3	4	5

12. Overall, how certain are you of the effects of your decisions or actions? (Circle one)

Very great amount	Great amount	Fair amount	Not much	Not at all
1	2	3	4	5

13. Overall, how adequate is the information you usually have for the situations you face in your work? (Circle one)

Completely	Fairly	Somewhat	Barely	Not at all
1	2	3	4	5

14. For each of the following statements, indicate how much you disagree or agree with the statement.

	Strongly disagree				Stronly agree
It is unclear to me exactly what I should do in order to perform my job better.	1	2	3	4	5
I really get little useful information about performance standards within my department.	1	2	3	4	5
Information about how my performance will be evaluated has been directly communicated to me.	1	2	3	4	5
People around here give pretty consistent information about what we can do to perform better in our jobs.	1	2	3	4	5

15. How long have you been an employee at this hospital? _____

16. How long have you been in your current position? _____

17. What is your current title? _____

18. What is you highest educational degree? _____

19. How old are you? _____

20. Are you male _____ or female _____ ?

Appendix C

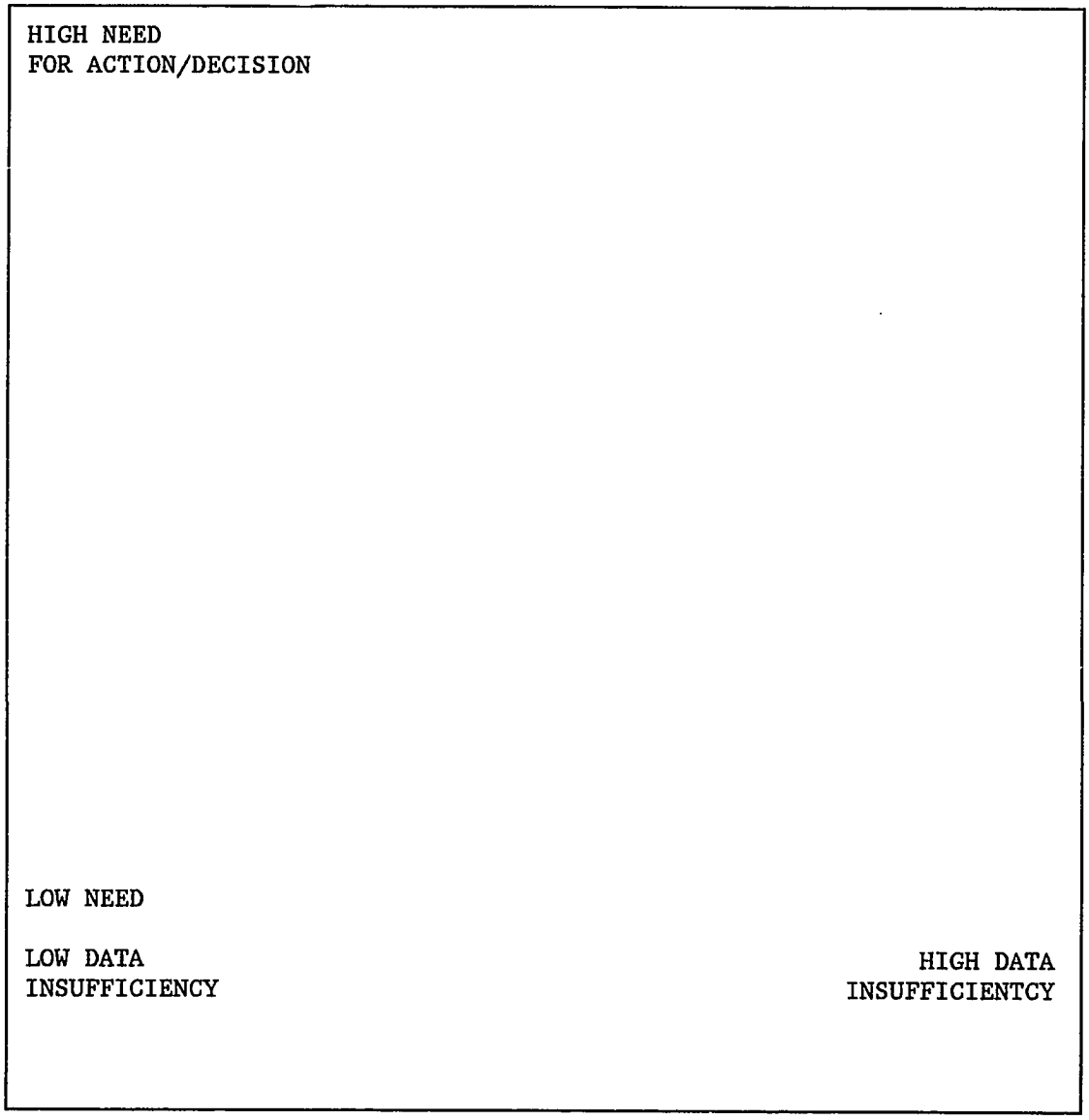
R AND T BALANCE GAME

Read the following list of items. For each of the items on the list below place the number corresponding to the item on the matrix (on the next page) in the one position that best reflects the degree of data insufficiency and degree of need for action.

1. Changes in expenditures
2. RN staffing for your unit
3. Qualifications of professionals on your unit
4. New patient related equipment on your unit
5. Types of patient insurance or coverage
6. RN turnover (related to your unit)
7. MD turnover (related to your unit)
8. General fiscal resources
9. Long term, stategic plans for your unit
10. Operating budget for your unit
11. Types of services provided by your unit
12. Number of patient beds on your unit
13. Market surveys related to patient using your services
14. Number of new patient services
15. Satisfaction of patients using your services
16. Affliations or contractual arrangements of concern to your unit
17. Level of patient acuity on your unit
18. Daily census of your unit
19. Patient care policies on your unit
20. Staff policies on your unit

The horizontal line represents a continuum of how inadequate or insufficient the information you have is regarding the item. The "High Data" end of the continuum reflects that the data are highly sufficient or adequate for the situational needs you normally experience. The vertical line represents a continuum of how strongly you feel that you must take some action or make a decison regarding the item. The "High Need" end of the continuum reflects that there is a very high need in the situations you normally experience to take some action or make a decision.

Please place the item number (from the previous page) in the position that best reflects the degree of data sufficiency and degree of need for action for that item.



Appendix D

COMMUNICATION ABSTRACTION FORM I

Mode	Date	From	To	Message	Impressions

Appendix E

COMMUNICATION ABSTRACTION FORM II

1. How many new hospital-wide policies related to patient care were written and enacted in the past six months:_____

   Please identify the three most important of those policies:

   1. _____
   2. _____
   3. _____

2. How many memos during the past six months were sent from administration to unit managers related to changes in patient care services? _____

3. How many meetings during the past six months were held between administration personnel and unit managers ? _____

4. How many meetings during the past six months were held between supervisors and unit managers? _____

5. How many memos and reports have been sent during the past six months to unit managers related to budget changes? _____

6. How many memos and reports have been sent during the past six months to unit managers related to manpower changes? _____

7. How many memos during the past six months have been sent from the maternity to administration regarding unit resource needs? _____

8. How many memos during the past six months have been sent from the maternity unit to administration regarding unit patient services? _____

9. How many memos have been sent to or posted for RN staff regarding unit resource allocations? _____

10. How many memos have been sent to or posted for RN staff regarding changes in patient services? _____

11. How many meetings have been held between the maternity unit manager and maternity staff RNs over the past six months? _____

12. How many meetings have been held between the maternity unit manager and delivering physicians over the past six months? _____

Appendix F

COMMUNITY DESCRIPTION FORM

Community is defined as the metropolitan area for the participating hospitals. Statistics are for the 1988 county in which the hospitals are located.

Population Description

1. Total Population: _____
2. Age distribution (percent of population):
   - Under 18 _____
   - 18-25 _____
   - 25-65_____
   - Over 65 ____
3. Per capital income:_____
4. Unemployment Rate: _____
5. Mortality rates (county):
   - leading cause of death: _____ rate: _____
   - second cause of death: _____ rate: _____
   - third cause of death: _____ rate: _____
6. Birth rate: _____
7. Premature births per 1000: _____
8. Maternal deaths per 1000: _____
9. Number of acute care hospitals in metropolitan area: _____
11. Total number of acute care beds in metropolitan area: _____
12. Number of hospital maternity units in metropolitan area: _____
13. Total number of maternity beds in metropolitan area: _____

Appendix G

HOSPITAL DESCRIPTION I

The following questions pertain to this hospital. Some of the questions concern basic information. Other questions are specific and may require that you refer to available documents or consult with others. Your assistance is greatly appreciated in gathering the most accurate data possible.

1. Total Number of acute care beds in hospital: _____

2. Average occupancy rate per month during past year: ____

3. Total number of employees (professional and support): _____

4. Total number of patients admited last year: _____

5. Would you say the number of admissions was:

More than expected ___ As expected _____ Lower than expected ____

6. Which one of the following best describes the corporate stucture of this institution?

HMO ____ IPA _____ PPO _____

FFS _____ Divisional _____ Other _____

7. Which one of the following best describes this institution's corporation type?

Private-for-profit _____ Community not-for-profit _____

Private Not-for-Profit _____ Sole propietary _____

8. Total number of departments within the acute care facility: _____

9. Number of nursing departments within the acute care facility: _____

10. Number of medical departments within the acute care facility: _____

11. Number of organization levels between CEO and highest nusing position:_

12. Number of organization levels between CEO and staff RN: _____

13. Total current fiscal year operating budget: _____

14. Please indicate the percent of total current year revenues expected from each of the following sources (total from all sources equals 100%):

Federal reimbursements _____ State reimbursements _____

Federal grants, contracts _____ State grants, contracts _____

National based third party _____ Locally based third party _____

Community donations _____ Financial investments _____

15. Please indicate the percent of total past year revenues generated from each of the following sources (total from all sources equals 100%):

Federal reimbursements	_____	State reimbursements	_____
Federal grants, contracts	_____	State grants, contracts	_____
National based third party	_____	Locally based third party	_____
Community donations	_____	Financial investments	_____

16. Each institution has a variety of affiliations and contracts. Please indicate the number of affiliations or contractual arrangements this institution has with each of the following type of payor source or provider arrangement:

HMO _____ IPA _____ PPO _____

FFS _____ Religious _____ Medicare _____ Medicaid _____

School of Nursing _____ School of Medicine _____

Other _____ Please specify, _____

17. How many task force or committee reports related to strategic planning regarding finances or manpower have been made available to you in the past year? _____

18. How many task forces or committee reports related to strategic planning regarding provision of patient services have been made available to you in the past year? _____

Appendix H

HOSPITAL DESCRIPTION II

The following questions are designed to collect information regarding this hospital. Some of the questions concern basic information. Other questions are specific and may require that you refer to available documents or consult with others. Your assistance is greatly appreciated in gathering the most accurate data possible.

1. Which of the following health care services are provided by this organization: (check all that apply)

Acute care inpatient _____ Outpatient clinics _____

Long term care _____ Short stay surgery _____

Other _____

2. How many new patient related programs were initiatated in the past year: _____

3. This number of new patient programs was:

more than planned ____ as planned _____ fewer than planned ____

4. Were specialized health professionals hired from outside of the organization for any of these programs? Yes _____ No _____

5. How many patient related programs were discontinuted in the past year:___

6. This number of discontinued or reduced patient programs was:

more than planned _____ as planned _____ fewer than planned ____

7. Were any health professionals laid off as a result of any program discontinuation?

Yes _____ No _____

8. Total Number of RNs employed for acute care: _____

9. Total number of RN FTEs in acute care: _____

10. Annual RN turnover rate (percet of all RNs) for acute care:_____

11. Annual manager turnover rate (percent of all managers) for acute care:___

12. How many task force or committee reports related to strategic planning regarding finances or manpower have been made available to you in the past year? _____

13. How many task forces or committee reports related to strategic planning regarding provision of patient services have been made available to you in the past year? _____

14. Please list the three most important pieces of patient care related equipment purchased in the past year which required administration level approval. For each item listed, please indicate how similar the new equipment was compared to any similar equipment in use at the time of the purchase.

Equipment List	How Similar 1=identical to current equipment 2=similar to current equipment 3=different from equipment 4=totally unfamilar equipment
a _____	_____
b _____	_____
c _____	_____

Appendix I

HOSPITAL DESCRIPTION III

The following questions are designed to collect information regarding this hospital. Some of the questions concern basic information. Other questions are specific and may require that you refer to available documents or consult with others. Your assistance is greatly appreciated in gathering the most accurate data possible.

1. How many marketing surveys, feasibility studies or other surveys conducted have been conducted in past year? _____

2. How many task force or committee reports related to strategic planning regarding finances or manpower have been made available to you in the past year? _____

3. How many task forces or committee reports related to strategic planning regarding provision of patient services have been made available to you in the past year? _____

3. How many changes in past year were made in long term strategic plans? ____

4. How many changes in past year were made in short term strategic plans? ___

5. What percent change has there been in projected current-year budget during the past two quarters, based on most recent budget data? _____

6. Would you say the budget change was:

More than expected ____ As expected ____ Less than expected ____

7. What percent change has there been in projected revenue during the past two quarters, based on the most recent budget data? _____

8. Would you say the change in projected revenue was:

More than expected _____ As expected ____ Less than expected ___

9. What percent change has there been in projected in costs/expenses during the past two quarters, based on the mose recent budget data? ____

10. Would you say the change in projected costs/expenses were:

More than expected _____ As expected _____ Less than expected ____

11. What percent of patients have as the primary payment source each of the following, using data over the past two quarters? (total= 100%)

Third Party _____ Champus _____

Medicaid _____ Private _____

Other _____

12. What percent of maternity patients have as the primary payment source each of the following, using data over the past two quarters? (total= 100%)

Third Party _____ Champus _____

Medicaid _____ Private _____

Other _____

13. Some institution have policies which establish either caps or quotas on providing services to different patient populations. Which of the following reflect the policies of this institution? (check all that apply)

_____ Have neither caps nor quotas on admitting any patients

_____ Have neither caps nor quotas on admitting any maternity patients

_____ Have caps on admitting patients with specific payor sources

_____ Have caps on admitting maternity patient with specific payor soruces

_____ One of the caps applies to maternity patients with Medicaid or uninsured

_____ Have quotas on admitting patients with specific payor sources

_____ Have quotas on admitting maternity patients wtih specific payor sources

_____ One of the quotas applies to maternity patients with Medicaid or uninsured

Appendix J

MATERNITY UNIT DESCRIPTION I

The following questions are designed to collect information regarding this hospital unit. Some of the questions concern basic information. Other questions are specific and may require that you refer to available documents or consult with others. Your assistance is greatly appreciated in gathering the most accurate data possible.

1. What has been the average number of deliveries per year, over past five years? _____

2. How many beds of each type of room are available on this unit?

   Labor only beds _____ Postpartum beds _____

   Delivery suites _____ Nursery beds _____

   Labor/delivery/recovery beds _____

   Labor/delivery/recovery/postpartum beds _____

3. What was your daily average occupancy rate last year? _____

4. What is your average daily maternity unit census (excl. infants)? __

5. How many unscheduled patients per week are seen that are not admitted to the unit (e.g. for NST or observation)? _____

6. What is the highest level of L & D care offered by this unit?

   Level I _____ Level II _____ Level III _____

7. What is the highest level of newborn care offered by this unit?

   Level I _____ Level II _____ Level III _____

8. Please check all services provided by maternity unit nurses:

   Prenatal education _____

   Infertility education _____

   Home visits to new parents _____

   Home visits to premature infants _____

   Premature infant and parents related _____

   Lactation consultation _____

   Nurse midwife deliveries _____

   Clinical nurse specialist _____

   Other _____

   Please describe, _____

9. What is the total number of maternity nursing employees? _____

10. Please indicate how many nurses of each type work on this unit:

Clincial specialists	_____	LPN/LVNs	_____
Staff RNs	_____	Nursing Assistants	_____
Charge nurses	_____		

11. Please indicate the number of FTEs for each type of nurse:

clincial specialists	_____	LPN/LVNs	_____
Staff RN	_____	Nursing Assistants	_____
Charge nurses	_____		

12. What percent of RNs work .8 FTE or more? _____

What percent of RNs work .5 FTE or less? _____

13. How many RN FTEs are currently vacant? _____

14. What was the turnover rate (percent of all maternity RNs) on this unit last year? _____

15. What percent of maternity RN staffing was agency during the past six months? _____

16. What other professionals are on staff of this unit?

a) _____ Total Number: _____

b) _____ Total Number: _____

c) _____ Total Number: _____

17. Which of the following limit the accessibility of your services to all potential maternity patients? Please check all that apply:

Physicians' clinical practice _____

Physicians' accptance of patients _____

Hospital payment policies _____

Level of care available _____

Geographic location of maternity unit _____

No limits on accessibility of services _____

Other, _____ _____

18. How many task force or committee reports related to strategic planning regarding finances or manpower have been made available to you in the past year? _____

19. How many task forces or committee reports related to strategic planning regarding provision of patient services have been made available to you in the past year? _____

Appendix K

MATERNITY UNIT DESCRIPTION II

The following questions are designed to collect information regarding this hospital unit. Some of the questions concern basic information. Other questions are specific and may require that you refer to available documents or consult with others. Your assistance is greatly appreciated in gathering the most accurate data possible.

1. What percent change has there been in the maternity current-year budget during the past two quarters, based on most recent budget data?
2. Does the current year budget change reflect:
   an increase? _____ or a decrease? _____
3. Would you say the budget change was:
   More than expected _____ As expected _____ Less than expecte ____

4. How many long-range strategy changes related to patient services have occured in past year? _____
5. How many hospital wide changes related to nursing affecting this unit occured in the past year? _____
6. How many committees or task forces currently are doing work related to either long-term or short-term strategy planning for this unit? ____
7. How many committees or task forces currently doing work related to either long-term or short-term strategy planning for this unit have maternity personnel representation? _____
8. How many task force or committee reports related to strategic planning regarding finances or manpower have been made available to you in the past year? _____
9. How many task forces or committee reports related to strategic planning regarding provision of patient services have been made available to you in the past year? _____

8. What percent of maternity RN staff have speciality certification? ___
9. What percent of maternity RN staff have 3 or more weeks vaction? ____
10. What percent of maternity RN staff are graduate nurses? _____

11. What is the ratio of RNs to labor patients on this unit? _____

12. What is the ratio of RNs to postpartum patients on this unit? _____

13. How many times per day does the OB or OBs on-call change? _____

14. How many times per day does anesthesia on-call change? ____

15. a) What percent of delivering MDs have standing orders for routine labor and deliver, and postpartum? _____

b) What percent of those standing orders have been revised or changed in the past six months? _____

16. a) What percent of delivering MDs have standing orders for special procedures (e.g. Ritadrine or OCT)? _____

b) What percent of those standing orders have been revised or changed in the past six months? _____

17. a) What percent of anesthesiologists have standing orders for labor and delivery? _____

b) What percent of those standing orders have been revised or changed in the past six months? _____

18. Please list the three most important pieces of patient care related equipment purchased in the past year which required administration level approval. For each item listed, please indicate how similar the new equipment was compared to any similar equipment in use at the time of the purchase.

1=identical to current equipment
2=simular to current equipment
3=different from equipment
4=totally unfamiliar equipment

Equipment List	How Similar
1._____	_____
2._____	_____
3._____	_____

Appendix L

UNIT DESCRIPTION I

The following questions are designed to collect information regarding this hospital unit. Some of the questions concern basic information. Other questions are specific and may require that you refer to available documents or consult with others. Your assistance is greatly appreciated in gathering the most accurate data possible.

1. What has been the average annual number of admissions to this unit, over past five years? _____

2. What was your daily average occupancy rate last year? _____

3. What is your average daily unit census? _____

4. Total number of beds on this unit? _____

5. How many beds of each type of room are available on this unit?

outpatient beds _____ inpatient beds _____

other, please specify _____ beds _____

6. Please check all services provided by nurses employed by this unit:

Inpatient classes on selected topics _____

Outpatient classes on selected topics _____

Home visits to discharged patients _____

Home visits to bereaved families _____

Clinical nurse specialist _____

Other _____

Please describe, _____

7.Is there a formal program in place which facilitates the education and/or onging treatment of patients seen on your unit? Yes ___ No ___

a) Do staff RNs participate on a regular basis in the delivery of this program? Yes ____ No ____

b) Do health care professionals from disciplines other than medicine and nursing participate on a regular basis in the delivery of this program?

Yes ____ No ____

c) The individiual responsible for coordinating this program is consided which of the following?

Outpatient _____ Manager _____

Inpatient _____ Staff _____

11. What is the total number of nursing employees on this unit? _____

12. Please indicate how many nurses of each type work on this unit:

Clincial specialists _____ LPN/LVNs _____

Staff RNs _____ Nursing Assistants _____

Charge nurses _____

11. Please indicate the number of FTEs for each type of nurse:

clincial specialists _____ LPN/LVNs _____

Staff RN _____ Nursing Assistants _____

Charge nurses _____

12. What percent of RNs work .8 FTE or more? _____

What percent of RNs work .5 FTE or less? _____

13. How many RN FTEs are currently vacant? _____

14. What was the percentRN turnover rate on this unit last year? _____

15. What percent of RN staffing was agency during the past six months? _

16. What other professionals are on staff of this unit?

a) _____ Total Number: _____

b) _____ Total Number: _____

c) _____ Total Number: _____

17. Which of the following limit the accessibility of your unit's services to patients? Please check all that apply:

Physicians' clinical practice _____

Physicians' accptance of patients _____

Hospital payment policies _____

Level/type of care available _____

Geographic location of this unit _____

No limits on accessibility of services _____

Other, _____ _____

Other, _____ _____

18. How many task force or committee reports related to strategic planning regarding finances or manpower have been made available to you in the past year? _____

19. How many task forces or committee reports related to strategic planning regarding provision of patient services have been made available to you in the past year? _____

Appendix M

UNIT DESCRIPTION II

The following questions are designed to collect information regarding this hospital unit. Some of the questions concern basic information. Other questions are specific and may require that you refer to available documents or consult with others. Your assistance is greatly appreciated in gathering the most accurate data possible.

1. What percent change has there been in the unit's current-year budget during the past two quarters, based on most recent budget data? _____

2. Does the current year budget change reflect:

   an increase? _____ or a decrease? _____

3. Would you say the budget change was:

   More than expected _____ As expected _____ Less than expected ____

4. How many long-range strategy changes related to patient services have occured in past year? _____

5. How many hospital wide changes related to nursing affecting this unit occured in the past year? _____

6. How many committees or task forces currently are doing work related to either long-term or short-term strategy planning for this unit? ____

7. How many committees or task forces currently doing work related to either long-term or short-term strategy planning for this unit have personnel representation from this unit? _____

8. How many task force or committee reports related to strategic planning regarding finances or manpower have been made available to you in the past year? _____

9. How many task forces or committee reports related to strategic planning regarding provision of patient services have been made available to you in the past year? _____

8. What percent of RN staff have speciality certification? _____

9. What percent of RN staff have 3 or more weeks vaction? _____

10. What percent of RN staff are graduate nurses? _____

11. What is the ratio of RNs to patients on this unit? _____

12. What is the average acuity of patients on this unit? _____

13. Please list the three most important pieces of patient care related equipment purchased in the past year which required administration level approval. For each item listed, please indicate how similar the new equipment was compared to any similar equipment in use at the time of the purchase.

1=identical to current equipment
2=simular to current equipment
3=different from equipment
4=totally unfamiliar equipment

Equipment List	How Similar
1._____	_____
2._____	_____
3._____	_____

Appendix N

UNIT DESCRIPTION III

1. How many hematologists admit patients to this hospital? _____
What is the average length of time those MDs have been on staff? ___
2. How many oncologists admit patients to this hospital unit? _____
What is the average length of time those MDs have been on staff? ___
3. How many internists admit patients to this hospital unit? _____
What is the average length of time those MDs have been on staff? ___
4. How many radiologists see patients on this hospital unit? _____
What is the average length of time those MDs have been on staff? ___
5. How many new MDs have begun admitting patients to this unit in the past six months? _____

This number of MDs new to the unit is equivalant to what percent of change in MDs ? _____

6. Are residents responsible for developing the medical treatment plan of patients on this unit? Yes _____ No _____

7. Are Fellows seeing patients on you unit? Yes _____ No _____
8. How many times per day does the oncologist on-call change? _____
9. How many times per day does the hematologist on-call change? _____
10.a) What percent of admitting MDs have standing orders for admissions?

b) What percent of those standing orders have been revised or changed in the past six months? _____
11.a) What percent of admitting MDs have standing orders for special procedures (e.g., Hickmans, extravasion)? _____

b) What percent of those standing orders have been revised or changed in the past six months? _____
12. How many task force or committee reports related to strategic planning regarding finances or manpower have been made available to you in the past year? _____
13. How many task forces or committee reports related to strategic planning regarding provision of patient services have been made available to you in the past year? _____

Appendix O

CLINICIAN FORM I

1. How many Family Practice MDs are doing deliveries at this hospital? _
What is the average length of time those MDs have been on staff? ___

2. How many obstetricians are doing deliveries at this hospital? _____
What is the average length of time those MDs have been on staff? ___

3. How many anesthiologists take call for deliveries? _____
What is the average length of time those MDs have been on staff? ___

4. How many pediatrians are on the medical staff? _____
What is the average length of time those MDs have been on staff? ___

5. How many MDs began practicing obstetrics in the past six months? ___
This number of physicians new to the unit is equivalant to what percent of change in MDs ? _____

6. How many task force or committee reports related to strategic planning regarding finances or manpower have been made available to you in the past year? _____

7. How many task forces or committee reports related to strategic planning regarding provision of patient services have been made available to you in the past year? _____

Appendix P

SERVICE RESULTS I

This form asks questions which describe maternity patients in the past year. If the data are not available, please make your best educated approximation.

Number of deliveries in the past year (1989) _____

1. Average age of mothers: _____
2. Average parity:_____
3. Average Perinatal risk score (if available):____
4. Percent of patients with prenatal education _____ %
5. Percent of deliveries by Cesarean section, in past year _____ %
6. Percent of labor patients receiving epidural or other anesthesia in past year _____ %
7. Number of deliveries with unscheduled inductions or aumentations ____
8. Number of patients receiving outpatient service (NST, OCT, checks) __
9. Number of antepartum or intrapartum patients transfered to tertiary care center in past year _____
10. The average Apgar scores in past year
    One minute: _____
    Five minutes: _____
11. Number of newborns transfered to a Level III center in past year __
12. Number of newborns less than 36 weeks gestation in past year _____
13. Number of newborns admitted to the Level II nursery for more than 24 hours ____
14. Number of new mothers requiring utilization review approval for length of stay ____
15. Number of early discharges _____
    What percent of these early discharges were planned _____ %
16. Percent of deliveries with Medicaid/DSHS coupons or no health insurance coverage ____%

Appendix Q

SERVICE RESULTS II

This form asks questions which describe the patients on your unit in the past year. If the data are not available, please make your best educated approximation.

1. Average age of patients: _____
2. Percent female patients _____ % Percent male patients _____ %
3. Average risk score of patients (if applicable): _____
4. Percent of patients who have received formal patient education related to their condition or treatment _____ %
5. Average number per day of unscheduled medical treatments or procedures done on the unit _____
6. Number of patients receiving outpatient service (ie, chemotherapy) __
7. Are experimental treatments or drugs offered to patients on this unit?

Yes ____ No _____

If yes, which experimental phase is most common (I, II or III)? _____

8. What is the readmission rate to this unit? _____
9. What is the average length of stay for patients? _____
10. What is the death rate on the unit? _____
11. What percent of deaths on this unit are planned? _____
12. What percent of patients received treatment at another facility before being admitted to your unit? _____
13. What percent of patients are transferred to another facility for further treatment?

jp145

_____

14. Percent of patients requiring Utilization Review approval for length of stay _____ %
15. Percent of patients with Medicaid/DSHS coupons _____ %
16. Percent of patients with no health insurance coverage _____ %

University of Washington Consent Form

Case Study of Organizational Uncertainty in An Acute Care Hospital

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Seattle, WA 98195
543-6950

I am a doctoral student at the University of Washington School of Nursing and am conducting my dissertation research. The research will consist of in-depth case studies of an acute care hospital in the Seattle area. The focus is on one aspect of the health care organization; namely, organizational uncertainty. All organizations experience and generate some degree of organizational uncertainty. Two types of organizational uncertainty, resource uncertainty and technological uncertainty, are particularly germane to health care institutional operations. Both types of uncertainty have the potential to influence decisions ultimately affecting patient outcomes. Therefore, a greater understanding of uncertainty is needed. The purpose of the dissertation research is to describe acute care hospital uncertainty as it is evident at different organizational layers.

If you decide to participate in this study, you will be interviewed and asked to complete two questionnaires. Participation in the study will take approximately three hours total, over a two to three week period.

Interviews will be conducted in small groups, consisting of 2-3 of your peers in the organization. The interviews will be conducted in a private place within the hospital. The interviews will not be conducted during your work hours. The interview will be audio tape recorded and transcribed. The interview will take approximately one to one and a half hours. Interview questions will focus on your perceptions of the work environment at this institution. Only the researcher will have access to the interview transcriptions. All names will be removed from the transcripts. The audio tapes will be destroyed after they are transcribed. The tapes will be transcribed within three weeks of the interview. Only the researcher and a professional transcriptionist will have access to the tapes. You may decline to answer any question in the interview. All responses and discussions within the group interview will be confidential.

One questionnaire consists of questions about your perceptions of your work environment. For example, some questions ask whether you have sufficient information or resources to do your work. You may refuse to answer any question on the questionnaire. All questionnaires will be returned directly to the researcher and responses will be anonymous.

You may be asked to complete an additional questionnaire regarding specific aspects of the hospital or of the maternity unit. The identity of the hospital will be anonymous. If you are asked to complete one of the hospital or maternity unit description forms, you may refuse to complete any of the items.

No risks are anticipated as a result of participating in this study. Some participants

No risks are anticipated as a result of participating in this study. Some participants may experience slight discomfort as a result of being interviewed. Some inconvenience may be experienced as a result of the time involved. To avoid the risk of releasing sensitive information related to work, questionnaires will be coded so as to protect the privacy of each respondent. In addition, the interviews will be scheduled so that administrative personnel will be interviewed first, followed by nurse managers, then physicians, and lastly staff RNs.

All institution specific data will be confidential. Only the researcher will have access to the data and know the identity of the hospitals. All the data will be analyzed for the purpose of constructing a thorough description of organizatinal uncertainty in the hospital. A risk in this research is the possible inadvertent identification of the hospitals and/or staff participants. To minimize this risk, all identifying or distinguishing features will be withheld from published reports, or altered to disguise the hospital and staff pariticipants.

The data will be retained for six months in a secure location and then destroyed.

You may refuse to participate or may withdraw from the study at any time without penalty or loss of benefits to which you are otherwise entitled. No costs or payments are associated with participation in the study.

_____

Signature of Investigator Date

Subject's Statement.
The study described above has been explained to me. I voluntarily consent to participate in this activity. I have had an opportunity to ask questions. I understand that future questions that I may have about the research or about my rights as a subject will be answered by the investigator listed above.

_____

Signature of Subject Date

Copies to: Subject
Investigator's file

Appendix S.

Curriculum Vitea

Michele Issel was born in Petaluma, California. She received her basic nurses training at the College of the Redwoods (1977), and her Baccalaureate of Science in Nursing (1981) from Sonoma State University. Both the Master's of Nursing (1985) and PhD in Nursing (1991) were awarded by the University of Washington. Her areas of focus were community health, organizational theory and health services research. Since the beginning of her nursing career she has worked as a staff RN, faculty and a consultant. She has published in nursing journals, contributed a chapter to a nursing text, and presented papers at national conferences. Michele was honored by induction into Sigma Theta Tau and a pre-doctoral fellowship from the National Center for Nursing Research.