

RELATIONSHIPS AND PATTERNS BETWEEN EXPERT
AND NONEXPERT CRITICAL CARE NURSING PRACTICE
AND PATIENT OUTCOMES

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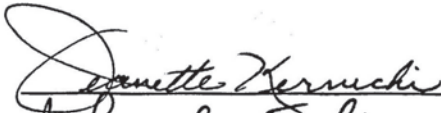
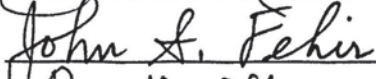
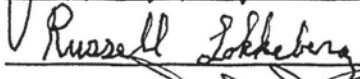
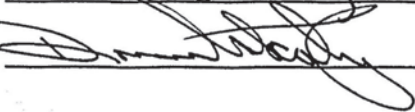
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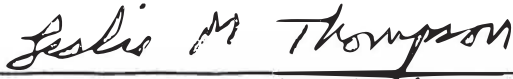
I am submitting herewith a dissertation written by Sandra K. Goodnough entitled "Relationships and Patterns Between Expert and Nonexpert Critical Care Nursing Practice and Patient Outcomes." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Nursing.


Carolyn M. Adamson, Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted


Dean for Graduate Studies and
Research

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DEDICATION

This work is dedicated to Phyllis R. Crabtree, R.N.
and Diane C. Adler, R.N., M.S.N., expert nurses, who were
my role models and mentors in nursing.

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RELATIONSHIPS AND PATTERNS BETWEEN EXPERT AND
NONEXPERT CRITICAL CARE NURSING PRACTICE AND
PATIENT OUTCOMES

ABSTRACT

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It is well accepted that expert nurses improve patient outcomes when delivering direct patient care. It has been hypothesized that expert nurses also improve patient outcomes by developing the knowledge and skills of nonexpert nurses. A previous study demonstrated improved patient outcomes, defined as reduced incidence of preventable pulmonary complications, in a medical critical care unit patient population after the unit staff nurses were exposed to a unit-based expert nurse for six months. Field notes of the participant observations of the expert nurse and informal interviews with unit staff were collected.

Using the grounded theory field approach, the field notes were analyzed to identify the factors in the process by which the expert nurse changed the practice of nonexpert nurses to improve patient outcomes. The purposive sample consisted of 26 medical critical care unit staff nurses and 31 critical care patients.

Data were analyzed by the constant comparative method. Findings revealed that expert critical care nursing practice was characterized by a Gestaltic nursing process and independent practice and that nonexpert critical care nursing practice was characterized by a dissociative nursing process and dependent practice. The core category of conversion emerged to explain the process by which the expert nurse advanced the practice of nonexpert nurses in the Medical Critical Care Unit. Major categories of conversion were developing clinical expertise and team building.

Results of the study indicated that over six months a unit-based expert nurse converted the practice of nonexpert nurses to one more like that of the expert nurse. The nonexpert nursing practice became more Gestaltic and independent. The data indicated that the changes in nonexpert nursing practice made a difference in individual patient outcomes, as well as reducing the incidence of preventable pulmonary complications in the unit patient population. The study provided direction for provisional testing of the theory of conversion in developing nursing practice to improve the quality of patient outcomes.

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CHAPTER I

INTRODUCTION

Patients admitted to hospitals are in the most vulnerable phase of their illness. This is particularly true of patients in critical care units, who have life-threatening illnesses and injuries. Critical care nurses need the requisite skills and decision making ability to care for these patients. However, the skills and clinical decision making abilities of critical care nurses have been found to be variable (Benner, 1982, 1983, 1984; Prescott, Dennis, & Jacox, 1987; Weeks & Schneider, 1987; Benner & Wrubel, 1989). Several study groups which examined nursing practice in hospitals concluded that nurses need to be more independent in their decision making related to the delivery of patient care (National Commission on Nursing, 1981; Institute of Medicine, 1983; American Academy of Nursing, 1983; Secretary's Commission on Nursing, 1988).

Decision making becomes more independent as practitioners develop expertise (Calkin, 1984; Kinney, 1986; Prescott, Dennis, & Jacox, 1987). Studies in this decade on nursing practice (Benner, 1982, 1983, 1984; Pyles & Stern,

1983; Smith, 1988; Benner & Wrubel, 1989) and decision making (Benner & Tanner, 1987; Young, 1987; Rew, 1988; Baumann & Deber, 1989) uniformly have demonstrated more independent and accurate decision making in expert nursing practice than in nonexpert practice.

The expert nurse in hospital practice settings is represented by the Clinical Nurse Specialist (CNS). The major characteristics of the CNS are clinical practice expertise and the ability to influence the quality of nursing care in a larger group of patients than can be personally attended by the CNS (Holt, 1984).

The concept of the CNS was devised in the late 1960s as a strategy for improving nursing care (WICHE, 1967). The association between expert nurse care delivery and increased quality of patient outcomes has widespread acceptance; the provision of direct patient care by the CNS improves the quality of patient outcomes (Calkin, 1984; Brooten, Brown, Munro, York, Cohen, Roncoli, & Hollingsworth, 1986; American Association of Critical-Care Nurses, 1987; Smith, 1988).

The availability of Clinical Nurse Specialists, however, precludes their use for direct care delivery in hospitals. In hospital settings, the CNS is assigned to a unit, a service, or the hospital at large. The rationale for employing Clinical Nurse Specialists in hospitals is that

the CNS enhances the development of the expertise of nonexpert nurses, thereby improving patient outcomes. Despite the acceded characteristics of the CNS and the rationale for employing the CNS, improved quality of patient outcomes from CNS development of nonexpert nurses is not recognized within the nursing community. In other words, the nursing community hypothesizes that the CNS improves the quality of patient outcomes indirectly by developing the clinical expertise of nonexpert nurses (Calkin, 1984; Holt, 1984; American Association of Critical-Care Nurses, 1987). However, data to support this hypothesis are minimal, indirect and very recent.

In this decade, reports have indicated that a unit-based expert nurse can effect improved patient outcomes by changing the practice of bedside nurses (Pyles & Stern, 1983; Goodnough, Bines, & Schneider, 1986, 1988; Knaus, Draper, Wagner, & Zimmerman, 1986; Weeks & Schneider, 1987). The process by which the practice and decision making of bedside nurses were changed was not described, leaving the reader with questions about intervening variables and coincidence as explanations of the findings.

This study examined the process by which a unit-based expert nurse advanced the practice and decision making of nonexpert nurses to improve patient outcomes. Knowledge of this process will permit provisional testing of the

association between expert and nonexpert nursing practice and quality of patient outcomes.

Problem of Study

The domain of the study was the relationship between expert and nonexpert critical care nursing practice and patient outcomes. The focus of the study was threefold: (a) to search for the presence of identifiable factors in the process by which an expert nurse advanced the practice of nonexpert nurses to improve patient outcomes, (b) to understand the relationship between expert and nonexpert critical care nursing practice and patient outcomes, and (c) to generate hypotheses regarding the preparation and development of critical care nurses. Therefore, this research was designed to answer the question: What are the factors in the process by which an expert nurse advances the practice of nonexpert nurses to improve patient outcomes?

Rationale for the Study

In today's hospital, critical care is fast becoming the norm rather than the exception. Nearly all hospitals have critical care units. The body of knowledge and the research base in critical care nursing have grown dramatically since critical care nursing emerged as a specialty in the 1960s. A contemporary issue is how to incorporate the growing body

of knowledge into the practice and decision making skills of critical care nurses, to the benefit of patient outcomes (American Association of Critical-Care Nurses, 1984, 1986; Tanner, Hartshorn, & Rosenfeld, 1989; Daly & Boller, 1990).

Increased acuity levels of patients and the proliferation of health care technology and specialization have increased the demand for critical care and for critical care nursing (Lumb, 1989; Tanner, Hartshorn, & Rosenfeld, 1989). The expectation is that this trend will continue well into the future and require larger and larger numbers of critical care nurses. A recent analysis of critical care nurse manpower (Levine & Associates, 1988) indicated there were approximately 225,000 critical care nurses in the United States in 1988. The need for critical care nurses projected for 1990 is in the 300,000 to 365,000 range.

How the demand for critical care nurses will be met poses an immediate problem for nursing service and education. Trends in undergraduate professional education, and higher education in general, are away from specialization and toward more generalist preparation (American Association of Colleges of Nursing, 1986; Fitzpatrick, 1988; Styles, 1989; Moccia, 1990). Parallel to the trends in undergraduate education is the thrust to prepare nurses for specialty practice at the graduate level (Styles, 1989; Hawken, 1990; Moccia, 1990).

Ninety-eight percent of nurses currently practicing in critical care settings are prepared at the diploma, associate degree, or baccalaureate level; only 2% are prepared at the graduate level and most of these nurses are practicing in roles other than direct patient care (Levine & Associates, 1988). It will therefore be some time before the goals of this movement are realized.

The changes in undergraduate nursing curricula currently being discussed are emphasis on the humanities, social responsibility, communication, and community service in place of nursing discipline content (Fitzpatrick, 1988; Moccia, 1990). Nursing discipline content is the basis for clinical practice decision making (Pyles & Stern, 1983; Prescott, Dennis, & Jacox, 1987; Smith, 1988; Benner & Wrubel, 1989; Benner, 1990). As a result of the deemphasis on nursing content in baccalaureate programs, it is assumed that specific clinical assessment and judgment skills will need to be taught and/or refined in the service setting for nurses educationally prepared at less than the graduate level.

The essence of critical care nursing is decision making and the willingness and ability to act on these decisions (American Association of Critical-Care Nurses, 1987). It seems clear that a large number of practicing critical care nurses are not adequately prepared to perform this basic

function of critical care nursing. While few studies were found that specifically documented inadequate decision making (Prescott, Dennis, & Jacox, 1987), studies of expert critical care nurse decision making frequently cited inadequate decision making of nonexpert nurses in contrast to the decisions of expert nurses (Benner, 1982, 1983, 1984; Pyles & Stern, 1983; Benner & Tanner, 1987; Smith, 1988; Benner & Wrubel, 1989).

In general nurses do not independently or consistently make decisions in areas considered to be part of their practice domain. Prescott, Dennis, and Jacox (1987) found inconsistencies in how nurses practice from hospital to hospital, unit to unit, and nurse to nurse. While nurses have long considered the activities of daily living (e.g., rest, nutrition, elimination, and mobility) to be an integral part of their practice domain, nurses were found not to make decisions regarding such activities independently. More than selecting and implementing interventions, nurses viewed and valued identifying patient problems and providing input to physicians as decision making (Prescott, Dennis, & Jacox, 1987).

Limited involvement in clinical decision making on the part of critical care nurses can have devastating effects on the patient. The role of critical care nurses goes beyond monitoring and performing tasks. They must be able to make

quick, accurate decisions in life-threatening situations and to anticipate and take actions to prevent complications.

The issue of preparation and development of the competent critical care nurse surfaces given the trends in undergraduate and graduate nursing education, the observation that many practicing critical care nurses are not adequately prepared for clinical decision making, and the fact that only 2% of current critical care nurses are prepared at the graduate level. Three studies implied that a unit-based expert nurse advanced the practice and decision making of bedside nurses, resulting in reduced patient mortality (Knaus, et al., 1986) or reduced morbidity (Pyles & Stern, 1983; Goodnough, Bines, & Schneider, 1986, 1988).

The domain of inquiry in this study was the process by which a unit-based expert nurse influenced the practice of bedside nurses to improve the quality of patient outcomes in a medical critical care unit. The description and explanation of this process provide needed data on the relationship between expert and nonexpert critical care nursing practice and patient outcomes. It is hoped that these data can be used to make decisions about the preparation of competent critical care nurses during the transition in academic preparation for entry into critical care nursing practice.

Conceptual Framework

In this study, qualitative research methods were used that are primarily inductive and do not impose existing theory onto the study data. However, theory frames the issues and thus served to focus the domain of inquiry. The Octascope Nursing Model provided the conceptual framework for this study. The Octascope Nursing Model was derived from the researcher's clinical nursing observations, existential philosophy (Heidegger, 1949, 1982; Barrett, 1962; Kaufmann, 1975), Martha Rogers' Science of Unitary Human Beings (Rogers, 1970, 1980, 1986; Malinski, 1986) and Benner's novice to expert research (Benner, 1982, 1983, 1984; Benner & Wrubel, 1989).

The Octascope Nursing Model is schematically represented in Figure 1. An octascope is a visually stimulating toy that creates a kaleidoscope from the world as understood by late 20th century human beings. As one peers through the peephole at the end of the tube, one is endlessly fascinated by the ever-changing scene of the world dissected and reflected inside the octascope. The octascope uses a prism to reflect what is seen into complex, varied, and changing forms. These forms, or patterns, occasionally are suggestive of what is seen, but more often are suggestive of things totally unlike what is being viewed through the octascope (Goodnough, 1987).

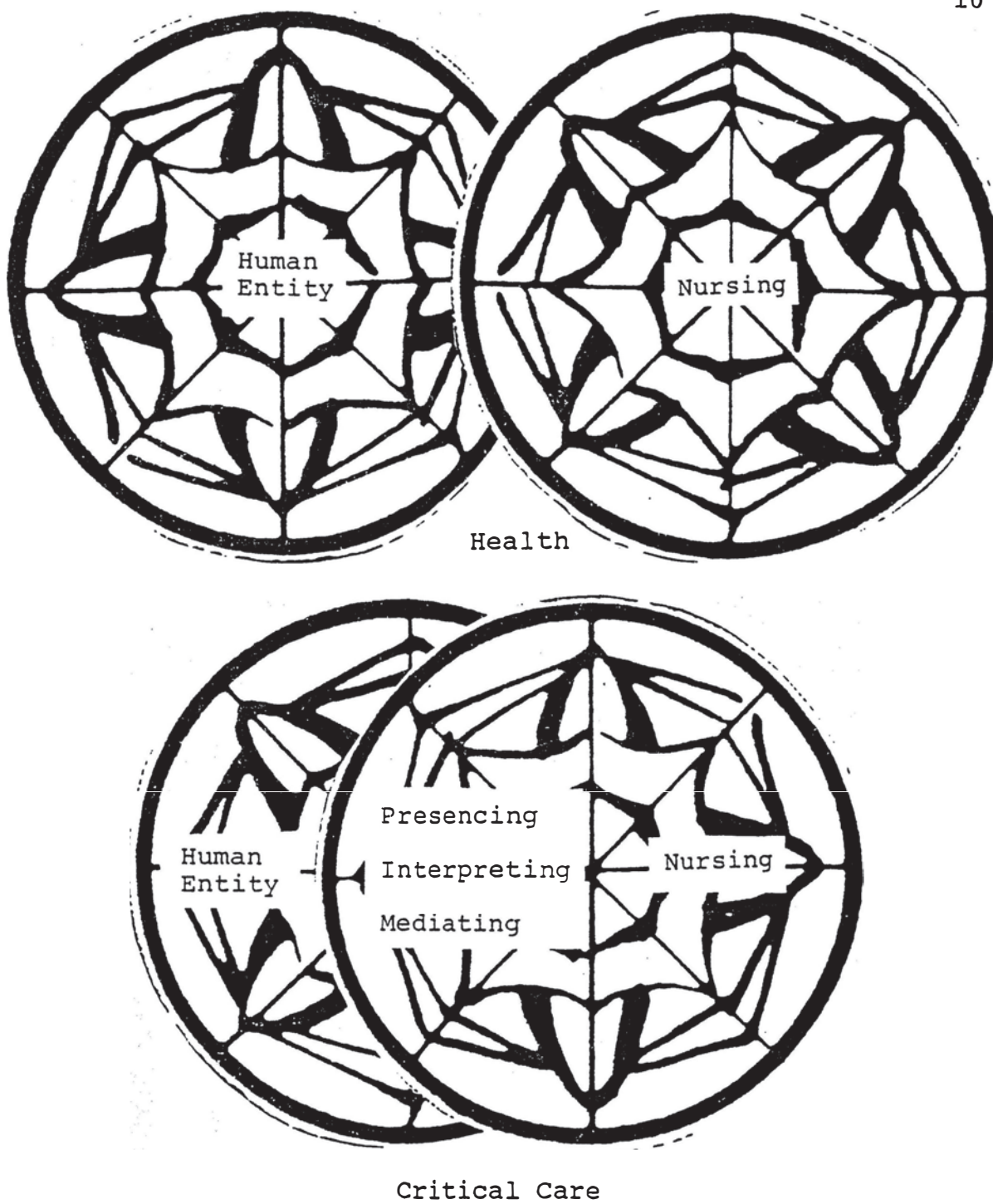
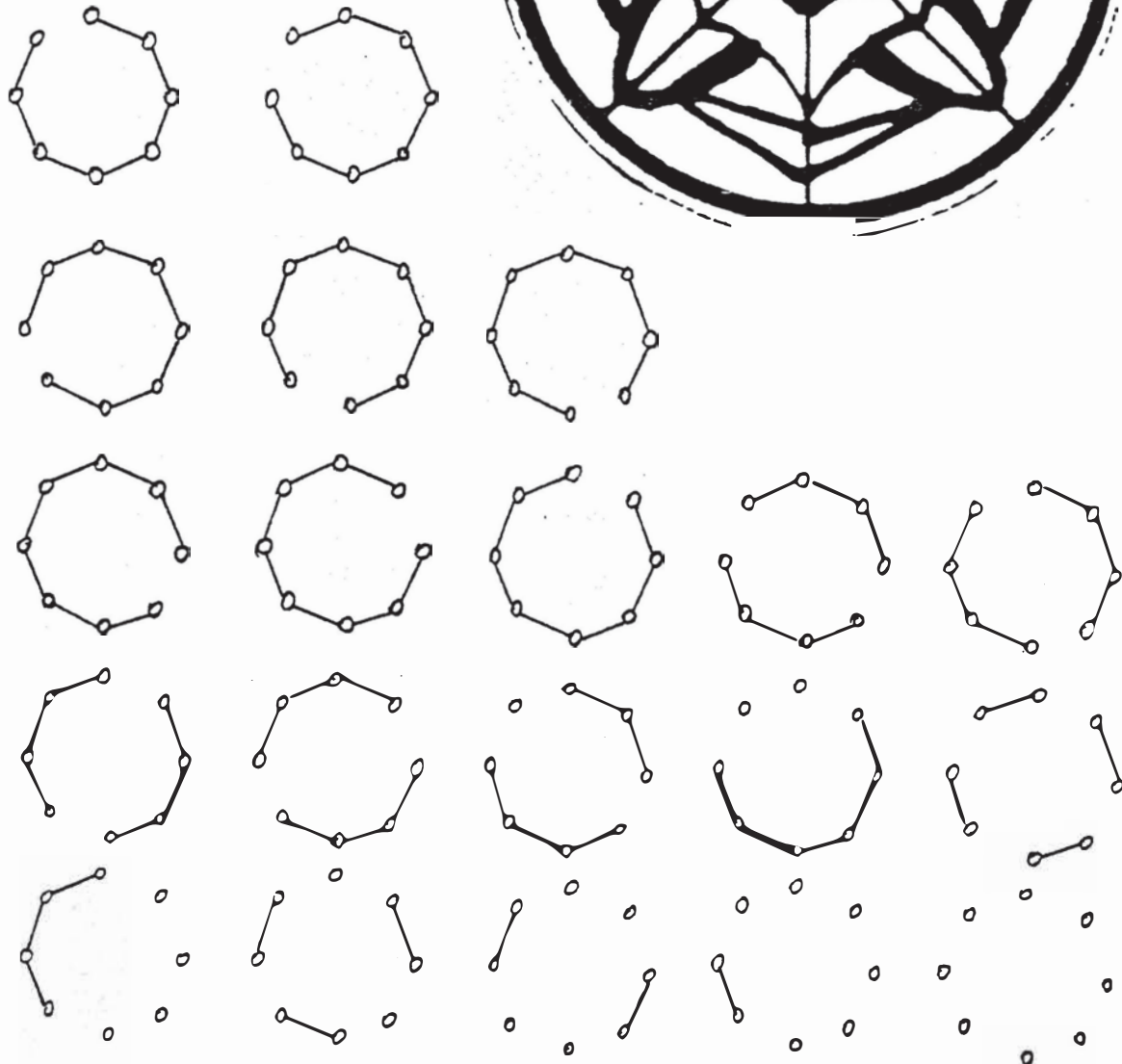
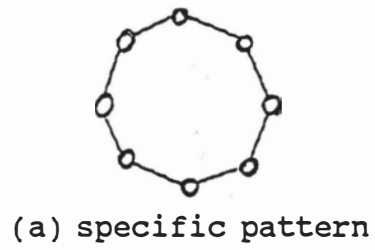


Figure 1. Schema of the Octascopic Nursing Model

The octascope, like the kaleidoscope, continually shifts from one set of relations to another. However, the octascope differs from the kaleidoscope in terms of what is viewed. When one looks through the octascope, one views the real world. When one looks through the kaleidoscope, one views the bits of glass or beads that are inside the tube. Thus, the octascope allows the empirical world to be seen in continually changing, symmetrical forms, in contrast to the kaleidoscope which allows a make-believe world to be seen in continually changing, symmetrical forms.

The central concepts of the Octascopic Nursing Model are the paradoxes of uniqueness and pattern. Empirical referents suggest pattern, order, and predictability in the world, but only that of a general and probabilistic nature. There are exceptions to most patterns and individuals express either patterns or exceptions to patterns in different ways (Crawford, 1982). For example, (a) in Figure 2 represents a specific pattern (e.g., a person's response to bad news). While the pattern has order it is only predictable to the extent that it has eight circles equidistantly apart. How those eight circles are connected together is context-dependent within the limits of the possibilities for connection. Figure 2 (b) offers additional possibilities of how the eight circles might be connected. Each pattern represents a particular configur-



(b) possible configurations of specific pattern in (a)

Figure 2. Configurations of Specific Patterns

ation of (a). To return to the example, a person's response to bad news consistently might be manifested by (a) but more likely will be manifested by various configurations depending on the situational context (e.g., perception of how "bad" the news is, coping capacity at the time the news is received, who delivers the news, etc.). Neither the eight circles nor the eight from the word "octascope" should be construed as hypotheses concerning the number of possible patterns. The symbolic and graphic representations simply are used to illustrate the finiteness, the multiplicity, and the symmetry of patterns in phenomena.

In the Octascope Nursing Model, the paradoxes of pattern and uniqueness of the individual are viewed as a causal relationship: Patterns change and it is the changing patterns that cause each person to be unique (Goodnough, 1987). The concepts of changing patterns and individuality affect the traditional definitions of environment, health, and nursing generic to conceptual models for nursing.

The separate definitions given to the individual and environment in theories of nursing fail to fuse them together (Meleis, 1985). If the individual and environment are considered as one entity, the individual person stands out within the context of the encompassing background. However, to study humanity removed from nature is to study the individual outside the context of life. A holistic view

implies viewing within the context of the whole and, for humanity, part of the whole is nature.

The dynamic and unique characteristics of the individual espoused in the holistic view are supported by viewing the human-environment entity within the concept of changing patterns. In the Octascope Nursing Model, the concepts of pattern and change are synthesized. This synthesis creates a different view of humanity and environment from the historical perspective of western civilization which has viewed the individual as separate and distinct from the environment (Barrett, 1962; Kaufmann, 1975), and reflects the philosophy of existentialism as it has developed over the past several hundred years.

⚡ changing patterns = human-environment = human entity

When human-environment is viewed as the sum of changing patterns, the following statements are considered as basic assumptions:

1. The individual and the environment are a single entity (Heidegger, 1949, 1982; Barrett, 1962; Kaufmann, 1975).

2. Existence is the stimulus for pattern change
(Heraclitus of Ephesus; Heidegger, 1949, 1982).

The Human Entity

The human entity is defined as a unique human being who is the sum of complex, variable, changing, and integrated patterns (Rogers, 1970) within a comprehensive multidimensional realm in which changing patterns constitute the core. The comprehensive multidimensional realm includes nature, and the fullness and naturalness of life with all its contradictions, visions, and possibilities (Heidegger, 1949).

What makes the human entity unique is the blend of changing patterns. The variables which constitute the individual are combined in a number of patterns. The variables individually, and in combinations, are in a constant process of change. The number of changing patterns guarantees that no two individuals are exactly alike nor does any given individual remain the same (Crawford, 1982; Goodnough, 1987).

Patterns may change slowly or rapidly. Slow changes permit description, explanation, and probabilistic prediction of an individual (e.g., That person is stubborn by nature, is gathering data to make a case against your position, and will never agree to your idea.) and of

humanity in general (e.g., The human species seeks meaning in life.). However slow the change, change is basic to the human entity. Therefore, the "truths" that hold for the individual and for mankind are not constant. The patterns thus may be viewed as both consistent and unpredictable (Goodnough, 1987).

The person describing or explaining the phenomenon of humanity, by definition, brings subjectivity to what is seen since the person doing the viewing is also unique and comprised of complex, integrated, and changing patterns. Additionally, the environment that encompasses each individual affects the discovery of "truth". Nevertheless, patterns do emerge and the patterns of an individual can be recognized and described. The danger exists in the failure to recognize that the patterns are obligated to change.

Health

Health is defined, in the Octascope Nursing Model, as a perception of the individual (Merleau-Ponty, 1962; Rogers, 1986; Malinski, 1986). Since the human entity is the sum of complex, variable, changing and integrated patterns, and health is a perception of the individual, health is also multidimensional, variable, changing and patterned. Health has no meaning outside the situational context of the individual.

Nursing

Nursing is defined as a component within the multidimensional realm of the individual that recognizes, describes, interprets, explains, mediates, and anticipates the changing patterns of a person within the context of health (Rogers, 1986). Nursing is not unique in terms of these actions. It is, rather, the situation in which nursing occurs and the multidimensionality of the interventions which differentiate nursing from other phenomena. The goal of nursing is to help the individual maintain uniqueness within the situational context of health.

The degree, effectiveness, and potential of nursing are dependent on the practitioners of nursing. Nurses who are skilled in pattern interpretation and pattern mediation practice a higher, and more effective, level of nursing. The ability to recognize and interpret complex, variable, and changing patterns and the range of mediation skills delineate the degree and efficacy of nursing. Nurse educators teach nurses to recognize and interpret the consistent patterns of the individual. Clinical experience teaches, and reinforces, that the patterns are complex, varied, and changing (Goodnough, 1987).

The goal of nursing is to maintain the individual's uniqueness. The process of nursing is circular, with the

elements often performed simultaneously. The elements of the nursing process are presencing, interpreting, and mediating (Benner, 1984; Goodnough, 1987).

Nurses who incorporate imagination, thought, feeling, intuition, meaning, and inquiry into their practices and views of the individual (Rogers, 1986) become skilled at presencing (Benner, 1984). Presencing combines the actions of assessing, experiencing, and eliciting to determine the person's perception of health. Presencing is a synthesis of intuition and understanding; the ability to comprehend by assimilation with the sum of one's previous knowledge and experience. Without this synthesis, experience is merely a series of perceptions, never fitting together into any meaningful context. Presencing is done simultaneously with pattern recognition. If presencing determines that the patient's perception of health is less than desired, interpreting occurs.

Interpreting (Benner, 1984) combines understanding, knowing, experiencing, judging, analyzing, and synthesizing to reach conceptual clarity. Conceptual clarity (Benner, 1984) is the holistic grasp of the human entity that suggests to the nurse which patterns are existent and which mediations should be initiated.

The third element in the nursing process is mediating the changes in patterns. Mediating pattern change involves

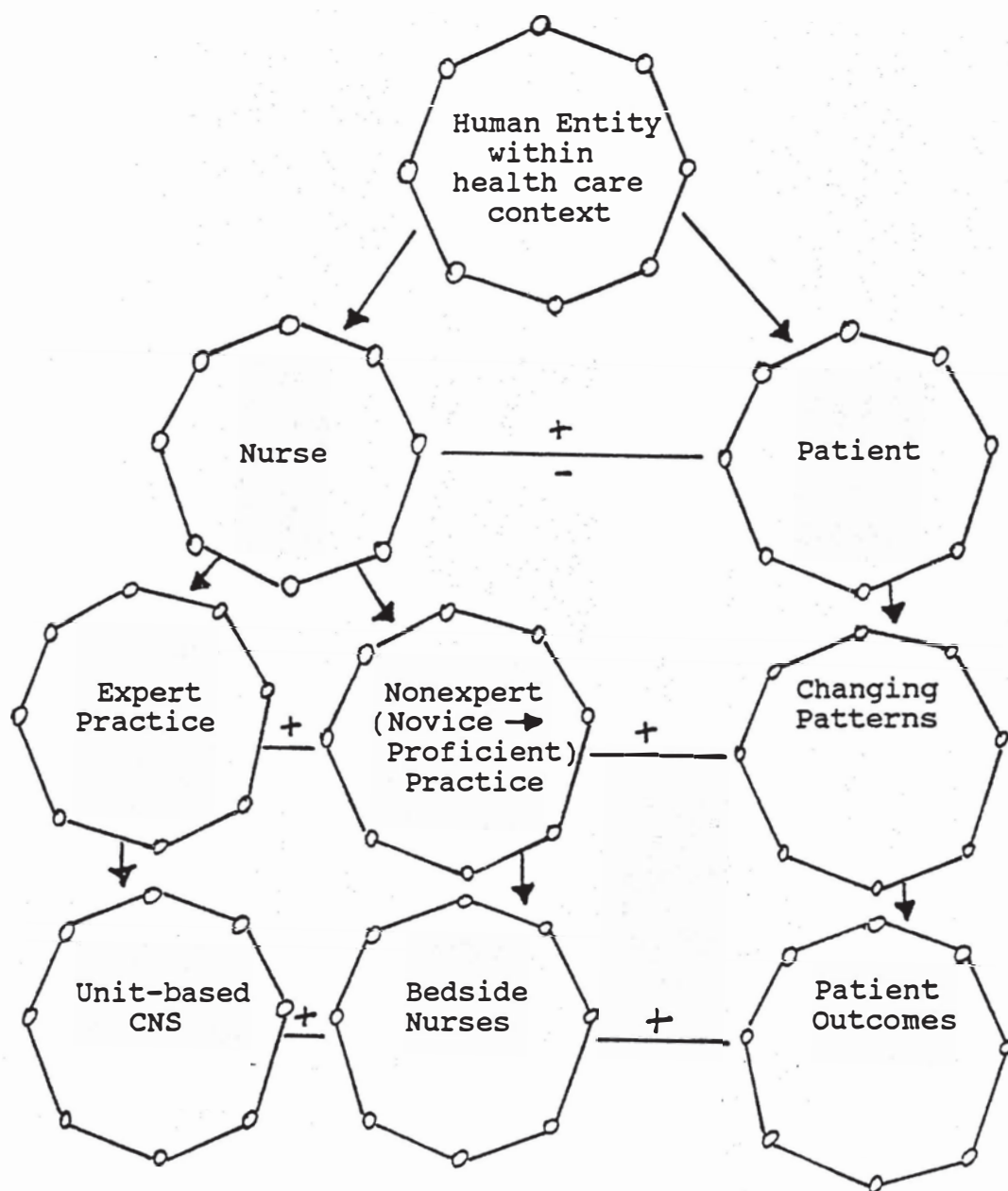
performing actions, guiding, and/or coaching the patient and also includes presencing and interpreting. This circular process continues until the person's perception of health is desirable. At such point, the changes in patterns are synergistic, the individual is again unique, and nursing is no longer needed.

Previously, nursing was defined as an environmental component of the patient. The phenomena of nursing and the nurse are external to the person when person refers to "patient" in a health-related situation. The nurse is, of course, a person and the "patient" is a person but they each become the environmental component of the human entity in relation to the other. Thus, the boundaries of the model are the dynamic situational contexts of health. The boundaries are fluid and change as the patient's perception of health changes.

The understanding and acceptance of this situational relationship is what promotes the therapeutic possibilities between the nurse and the patient. The therapeutic possibilities are enhanced when the nurse looks through an octascope and views the real world. If the nurse looks through a kaleidoscope, focusing on bits and pieces of the person, a make-believe world will be seen and the therapeutic possibilities will not be realized.

In this study, the factors in the process by which an expert nurse influenced the practice and decision making of nonexpert bedside nurses to improve patient outcomes in a medical critical care unit were identified. The purpose of identifying such factors was to provide directions for the effective preparation and development of critical care nurses. Qualitative research methods were used which resulted in the generation of grounded theory from the data. The theoretical notions of the investigator, as expressed in the Octascope Nursing Model, focused the domain of inquiry. Further, the Octascope Nursing Model describes how the investigator regards the paradigms of nursing - person, environment, health, and nursing. These views influenced how the investigator explored the data to achieve the purpose of this study. Subjectivity of the investigator is inherent in qualitative research. Both the theoretical notions of the model and the contexts in which the data were collected shaped the interpretation of the findings.

Figure 3 illustrates how the Octascope Nursing Model was used as the conceptual framework for this study. The human entity (both nurse and patient) is unique and characterized by changing patterns. The expert nurse can recognize and mediate the changing patterns of both nurse and patient. However, in this study the expert nurse taught the nonexpert nurse to recognize and mediate the changing



CNS, Clinical Nurse Specialist; \pm , positive or negative relationship; +, positive relationship

Figure 3. Schema of the Relationship Between Expert Nurse, Nonexpert Nurse, and Patient

patterns of the patient. Operationally, the expert nurse was a unit-based Clinical Nurse Specialist who influenced the bedside nurses to improve the quality of patient outcomes.

Assumptions

The assumptions underlying this study were derived from the Octascope Nursing Model and included:

1. The nature of the human entity reflects attributes or characteristics that are generally patterned (Rogers, 1970, 1986).
2. Several or more possible patterns may be observed for a given phenomenon (Crawford, 1982).
3. The expert nurse recognizes, interprets, mediates, and anticipates changing patterns of the human entity.
4. The expert nurse teaches the nonexpert nurse to recognize, interpret, mediate, and anticipate changing patterns of the human entity.

Definition of Terms

The major conceptual terms in this research were critical care nursing practice, expert nurse, nonexpert nurse, patient outcome(s), and pattern(s). Concepts which emerged during the research are defined in Chapter IV.

Conceptual and operational definitions for the key terms follow.

1. critical care nursing practice: attention to, and actions based on an understanding of, the relationships between illness and disease; (Benner & Wrubel, 1989). In this study, critical care nursing practice was operationally defined as the professional customs, thoughts, feelings, and performances of the expert and nonexpert nurses in the medical critical care study unit.
2. expert nurse: a master's-prepared Clinical Nurse Specialist with advanced knowledge and practice skills who can function under general guidelines, needing less detailed procedures, protocols, and direct supervision than nurses with less preparation (Benner, 1984; Brooten, et al., 1988); a nurse who is skilled in changing pattern recognition, interpretation, mediation, and anticipation and who views person and environment as an inseparable human entity (Octascope Nursing Model). In this study, expert nurse was defined operationally as a nurse with a baccalaureate and master's degree in nursing who had: (a) specialized at

the master's level in critical care, (b) prepared for the functional role area of Clinical Nurse Specialist, (c) > three years of previous experience in the role of critical care Clinical Nurse Specialist, and (d) been based full-time in the medical critical care unit for six months.

3. nonexpert nurse: a clinical nurse who needs specific guidelines, detailed procedures, protocols, and direct supervision (Benner, 1984; Brooten, et al., 1988); a nurse who views the human being and environment as separate and distinct entities (Octascope Nursing Model). In this study, nonexpert nurse was defined operationally as the bedside nurse in the medical critical care study unit.
4. patient outcome(s): the integration and interrelatedness of an individual's compositional perception (Merleau-Ponty, 1962); presence or absence of medical complications during hospitalization (Dunbar, 1986); maintenance or loss of uniqueness (Octascope Nursing Model). In this study, patient outcomes were defined as patient responses to critical care nursing practice, as described in the field notes.

5. pattern: characteristic arrangements of the human entity which are in a continual state of flux and change in an integrated motion to maintain the individual's uniqueness (Octascope Nursing Model). In this study, pattern was defined as the recurring small units of behavior or gestaltic features which were identified and understood through the use of qualitative research methods.

Limitations

The limitations of this study included:

1. Investigator bias with respect to the events or people observed may have skewed the interpretation of the data toward a particular perspective. This limitation may have particular significance in an exploratory study in which access to a wide range of events, people, and perspectives ensures validity of the data collected.
2. Similarly, the participant observer focus on selected observations, such as interactions during the follow-up of patients, may have weighted data collection and data analysis toward a skewed interpretation.
3. The investigator observed and interpreted interactions within the context of her own values and beliefs. This aspect of the participant observer data collection technique may have led the researcher to "miss

the forest while observing the trees." Data may have been interpreted differently by another investigator with different values and beliefs.

4. The procedures used for data collection were dependent, in part, upon the researcher's characteristics and opportunities during data collection. Therefore, precise replication of this study would be impossible.

Summary

Recent studies have demonstrated reduced patient mortality and reduced patient complications in critical care units where the staff nurses had access to a unit-based expert nurse. However, no data are available on how the expert nurse advances the practice and decision making of nonexpert nurses. Data on the process by which nonexpert nursing practice is changed to improve patient outcomes are needed to provide direction to the education and preparation of competent critical care nurses. The grounded theory method of constant comparative analysis provided an approach to permit explanation of the process by which an expert nurse advanced the practice of nonexpert nurses to improve the quality of patient outcomes in a critical care unit.

CHAPTER II

REVIEW OF LITERATURE

From preclassical times to the present, value has been placed on "knowing that" (Flew, 1979), the formal knowledge of causal relationships between events. The predominant approach to knowing reality in nursing has been to formally test propositions of experiential phenomena in controlled experiments (Carper, 1978; Gortner & Schultz, 1988). Studies of critical care nursing practice have been conducted within the framework of "knowing that." Until recently, however, very little has been learned about the essence - the knowledge and skills - of critical care nursing practice. During this decade, studies of critical care nursing practice have been conducted within the framework of "knowing how" (Polanyi, 1962; Kuhn, 1970), the personal knowledge of skill acquisition.

This chapter addresses the significant research and writings that prompted this study. First knowledge and skill acquisition are discussed within the context of the tenets of existential philosophy. Subsequent sections focus on the concepts of skilled knowledge, subsidiary and focal

awareness, context-dependent perception, pursuit of purpose, and the master-apprentice relationship. A summary of the discussion concludes this chapter.

Knowledge and Skill Acquisition

Martin Heidegger (1889 - 1976) was a German philosopher who did not regard himself as an existentialist. However, Heidegger's ontology and axiology are echoed in existential writing (Barrett, 1962; Kaufmann, 1975; Flew, 1979).

Heidegger adopted the phenomenological method to examine data of the present experience and disregarded preconceived epistemology and logic that made a distinction between the person's consciousness and the external world. Heidegger conceptualized the fundamental mode of being in the world through participation and involvement. He believed action and knowledge to be inseparably related. He characterized "self" as potentiality for action, with an orientation towards the future which entails possibilities and the constant necessity of choice (Heidegger, 1949).

Philosophers of science such as Kuhn (1970) and Polanyi (1962) advocated human oneness with the environment, involvement, participative action, and possibility potentiation as fundamental ways of knowing, although they are not identified as proponents of the existential view. These philosophers observed that "knowing how" is a

different kind of knowledge from "knowing that." Polanyi (1962) labeled the knowledge of "knowing how" as personal knowledge. Personal knowledge synthesizes the intense participation and intellectual powers of the observer. In contrast to the objective, formal knowledge of "knowing that", personal knowledge requires the direct and passionate involvement of the observer into the act of knowing or in the event to be studied (Polanyi, 1962; Flew, 1979).

Recently, nursing studies have been conducted on critical care nursing practice within the framework of personal knowledge as a way of knowing. Collectively, these studies suggest that the essence of critical care nursing practice is "skilled knowledge" and that skilled knowledge is acquired within the clinical context. The studies further suggest that acquisition of skilled knowledge in critical care nursing practice is dependent on the acceptance of the major tenets of existential philosophy: the unity of person and environment, a realization of possibilities, the inseparability of action and knowledge, and the involved participation of the nurse in the acts of knowing and performing.

Skilled Knowledge

Polanyi (1962) asserted that skill shapes knowledge. He defined skill as the art of doing and the art of knowing

and argued that the acquisition of skill is dependent on the inseparable and simultaneous acquisition of the art of doing and the art of knowing. Dreyfus (1979; Dreyfus & Dreyfus, 1980) studied the acquisition of skill in airline pilots and chess players and identified three major features of skilled performance. One feature is the change from reliance on formal knowledge to reliance on concrete, particular experience to guide performance. The second is the change in how a situation is perceived from equally relevant parts to a whole in which only focal parts are relevant. The third feature of skilled performance is a change from detached observer to involved performer (Dreyfus & Dreyfus, 1980). From his observations of airline pilots and chess players, Dreyfus developed a model of skill acquisition. The Dreyfus model specifies that one passes through five levels of proficiency in the development of a skill: novice, advanced beginner, competent, proficient, and expert (Dreyfus, 1979; Dreyfus & Dreyfus, 1980). The levels parallel changes in the three major features of skilled performance.

Benner (1982) found the Dreyfus model of skill acquisition applicable to the practices of 67 nurses with varying clinical experience. The first two features of skilled performance were found to change in the five levels of nursing practice performance. Benner found that novice

nurses did not use discretionary judgment. Since novices had no experience with clinical situations, they used objective, context-free rules to guide their actions. However, the rules didn't help novices determine which actions were most relevant in a particular situation. Nor did rules guide action when exceptions were encountered.

Advanced beginners had enough experience with patient care to recognize recurrent situations. They could incorporate aspects of recurrent situations into guidelines for actions in similar situations. However, they reverted to objective, context-free rules in dissimilar situations and were unable to see the differential relevance of pieces of clinical data (Benner, 1982).

Competent nurses were nurses with two to three years of clinical experience. These nurses began to see their actions in terms of long-term goals. The goals directed the priority and relevance of the clinical situation, present actions, and future actions. The deliberate goal orientation helped the nurses achieve efficiency and organization in their clinical practices. Competent nurses were found to best manage the contingencies of patient care within the structure of standard care plans and procedural routines (Benner, 1982).

Proficient nurses developed speed and flexibility in their practices. They perceived situations as wholes and

could recognize dissimilar situations as being exceptions to the norm. Proficient nurses made clinical decisions with greater comfort, speed, and flexibility than the competent, advanced beginner, or novice levels of the practice continuum. They could differentiate relevance and priority of actions and their decision making incorporated discretionary judgment from past contextual experiences (Benner, 1982).

Expert nurses were found to have an intuitive grasp of a patient situation, which enabled them to accurately hone in on the relevant and priority problems and actions. Expert nurses saw possibilities for patient outcome and recovery and implemented interventions specifically targeted toward realizing the possibilities. The experiential base of expert nurses permitted a holistic perception of both similar and dissimilar contextual situations (Benner, 1982).

As suggested by the Dreyfus model of skill acquisition, Benner (1982) found a continuum of skilled performance levels in nursing practice. This continuum ranged from a fragmented, procedural, and objective, context-free, rule-governed practice in the novice nurse to a holistic, situation-governed practice in the expert nurse.

Benner (1983) further analyzed the novice and expert nurse data from the previous study (Benner, 1982). Transcripts of small group interviews and field notes on

observations were analyzed and competencies were identified. The competencies were then inductively grouped into seven domains of nursing practice. Exemplars were used to provide contextual descriptions of the competencies. While Benner reported that the clinical competencies identified were neither comprehensive nor exhaustive, they illustrated the extent of critical discretionary judgment used by nurses in practice.

Benner (1982, 1983, 1984; Benner & Wrubel, 1989) posited that experience is a requisite for expertise. Experience was used in the Heideggerian sense of changing preconceptions that are not confirmed by the actual situation and confirming perceptions that are confirmed by the actual situation. Only when the situation confirms, refines, elaborates, or disconfirms previous notions, propositions, or principles does the event become "experience" (Heidegger, 1949). As the nurse gains this type of experience, personal knowledge is developed and the nurse acquires "knowing how."

Benner (1984) further developed the seven domains of expert nursing practice in her celebrated book, From Novice to Expert. The book challenged the significant role of the scientific method as a way of knowing nursing and asserted the central role of perceptual awareness in nursing practice. Benner carefully developed the proposition that

more skilled understanding of a clinical situation permits appropriate actions without rigid adherence to rules, procedures, and policies.

Twenty-one pairs of novice-expert (preceptee-preceptor) dyads were interviewed separately about patient care situations they had shared. Data from these interviews were added to the data from the 67 nurses in a previous study using participant observation and informal interviews (Benner, 1982). The pooled data were analyzed with an interpretive strategy based on Heideggerian phenomenology (Heidegger, 1982). The interpretive strategy is similar to the constant comparative method (Glaser & Strauss, 1978) used in this study, with the difference being that the intent of the interpretive strategy is to identify meanings and content while the intent of the constant comparative method is to identify theoretical terms.

In this expanded analysis, Benner (1984) found the third feature of skilled performance in the Dreyfus model, a change from detachment to involvement, to be applicable to nursing. The skilled nurses in Benner's sample repeatedly described a committed, involved relationship with the patient. The Dreyfus model of skill acquisition (Dreyfus & Dreyfus, 1980) predicts that commitment and involvement is necessary for a sense of salience to develop. An observer who is distanced is less likely to notice subtle changes in

patients. Thus a certain level of commitment and involvement is necessary for expert performance.

Pyles and Stern (1983) studied the practice of critical care nurses in the early detection and prevention of cardiogenic shock in patients with acute myocardial infarction. Data were collected from interactions and in-depth interviews with 28 critical care nurses who worked in Medical Critical Care Units (MCCUs) of large, urban hospitals in northern Louisiana. Fifty-seven percent of the nurses had a baccalaureate degree in nursing, 25% had diplomas, and 18% had associate degrees. All subjects had at least one year of MCCU experience (29% had one to two years MCCU experience, 32% had 3 - 5 years, and 38% had 5-11 years).

Using the grounded theory method (Glaser & Strauss, 1978), the investigators developed a theory of Nursing Gestalt to explain the process by which experienced critical care nurses made judgments about the development of cardiogenic shock. The investigators defined Nursing Gestalt as a dynamic "matrix operation whereby nurses link together basic knowledge, past experiences, identifying cues presented by patients, and sensory clues including what nurses call 'gut feelings'" (Pyles & Stern, 1983, p. 52). Using this synergy of logic and intuition, nurses then use

categorization and differentiation to derive diagnoses upon which they base their interventions.

Pyles and Stern (1983) proposed that Nursing Gestalt explains the process by which experienced critical care nurses make clinical assessments, diagnoses, and decisions. They found Nursing Gestalt to be rooted in accurate identification of clinical cues and sensory perceptions, learned from knowledge, experience, and support from experienced nurses. Pyles and Stern (1983) conducted their research prior to the publication of Benner's (1982, 1983, 1984) work. They did not report their definitions of experienced, inexperienced, expert, and nonexpert nurses. Whether years of experience or other criteria were used to differentiate nursing performance is unknown.

Smith (1988) conducted an exploratory clinical investigation to characterize the phenomenon of "deterioration" in critically ill patients. Six critical care nurses from two community hospitals were interviewed about their clinical experiences with the phenomenon of deterioration. All subjects had at least two years experience in critical care. The subjects had associate, baccalaureate, and master's degrees. The interviews were analyzed using Glaser and Strauss' (1978) grounded theory method. Smith found 13 themes in the interview data. However, the data indicated that it is the totality of the phenomenon that constitutes

deterioration. Further, the phenomenon of deterioration can be perceived, and often acted upon, by experienced critical care nurses prior to objective signs of patient change in status.

Benner and Tanner (1987) studied clinical judgment by obtaining reports of critical incidents from expert critical care nurses. Their approach led to a Gestalt view of the clinical judgment process and supported that expert judgment derives from a grasp of the whole situation. In this study, sense of salience was defined as the phenomenon where events, and their nuances, emerge as more or less important (Benner and Tanner, 1987). The expert nurse considers selective, interrelated observations as more pertinent than others. Sense of salience permits expert nurses to respond effectively to a clinical situation without the use of formal rules or checklists. The novice nurse does not have a deep background understanding of the patient situation and, therefore, does not have a sense of salience in clinical practice. The novice nurse must use standards and formal rules as guidelines for clinical judgment.

The works of Polanyi (1962), Dreyfus (1979; Dreyfus & Dreyfus, 1980), Benner (1982, 1983, 1984), Pyles and Stern (1983), and Benner and Tanner (1987) relate the acquisition of skill to the personal knowledge of knowing how. The formal knowledge of "knowing that" is acquired by testing

propositions within the detached objectivity of experimentation. In contrast, the personal knowledge of "knowing how" is acquired by immersing oneself, directly and personally, into the particular situational context. Subjective immersion teaches the learner to rely on concrete experience, holistic and differential perception, and involvement as an important method of acquiring knowledge. Knowledge obtained in such a way may be called skilled knowledge because of the inseparability of action and knowledge and because of the qualitative distinctions in how the knowledge is acquired and applied. A continuum of skilled performance was developed by Dreyfus (1979; Dreyfus & Dreyfus, 1980) and tested with critical care nurses (Benner, 1982; 1983; 1984; Benner & Tanner, 1987; Benner & Wrubel, 1989). The continuum distinguishes between gradations of skilled performance from novice to expert practitioner.

Subsidiary and Focal Awareness

The propositions of the inseparability of action and knowledge and human oneness with the environment are central to understanding the acquisition of skilled knowledge. Polanyi (1962) identified two types of awareness when performing a skill: subsidiary awareness and focal awareness. The two kinds of awareness are mutually

exclusive. Subsidiary awareness remains in the background during the performance of a skill and focal awareness is highlighted. Polanyi offered the example of how one uses a hammer and nail. One watches the effect of the hammer strokes on the nail and wields the hammer to hit the nail most effectively. When the hammer is brought down, one does not feel that its handle has struck the palm of the hand but that its head has struck the nail (focal awareness). Yet in a sense one is alert to the feelings in the palm and fingers that hold the hammer (subsidiary awareness). The feelings guide one in handling the hammer effectively. The nail is the focal object of attention while the hammer is an instrument which is merged into the focal awareness of driving the nail. The context is destroyed if one shifts focal attention to the feelings of the hammer in the palm and fingers. The head striking the nail receives subsidiary awareness and the nail is struck ineffectively. While one can ascertain the details of the skill performance, the performance is paralyzed if one focuses attention on these details.

An extension of the concept of subsidiary and focal awareness may be applied to Gestalt psychology. The particulars of a pattern must be understood jointly, since if one observes the particulars separately, they form no pattern at all. The appreciation of a pattern as a whole is

contradicted by switching focal attention to the fragments of the pattern. Attention can hold only one focus at a time and it is self-contradictory to be both subsidiarily and focally aware of the same particulars at the same time.

Benner and Tanner (1987) defined skilled know-how as a perceptual takeover wherein the body takes over a skill without deliberate thought. Skilled know-how is the same phenomenon as subsidiary awareness (Polanyi, 1962). An exemplar from Benner and Tanner's research on clinical judgment illustrates the phenomenon of skilled know-how in critical care nursing practice.

"When I first went into critical-care nursing, I knew what each drug did. I knew what the drips did. I knew what the monitors said and why. But I couldn't put it all together. But then...it's almost as if you visualize the patient's arteries and veins expanding and contracting. You know that as you turn this drip up, those veins are going to contract. That's how you comprehend. That's how you get to be on top of something, so that you can look at any portion of this person's body and know what's dilating and constricting or what should be. And if it doesn't happen the way you visualize it, you can find that out and figure out why (Benner and Tanner, 1987, p. 26)."

The acquisition of skilled knowledge is dependent, in part, on the integration of skill and knowledge into the learner's subsidiary awareness. Dreyfus (1979; Dreyfus & Dreyfus, 1980) and Benner (1982, 1983, 1984; Benner & Tanner, 1987; Benner & Wrubel, 1989) implied that the degree and extent to which skilled knowledge is incorporated into

the learner's subsidiary awareness reflects the learner's level of performance on the novice to expert practice continuum.

Context-dependent Perception

The central role of perceptual awareness in the acquisition of skilled knowledge was advanced by Polanyi (1962) and substantiated by Benner (1983, 1984; Benner & Wrubel, 1989), Pyles and Stern (1983), Benner and Tanner (1987), Young (1987), Smith (1988), and Rew (1988). Polanyi (1962) declared that expert skill cannot be attained without well-developed perceptual abilities and, further, that perception must be context-dependent. The ability to perceive or recognize reality takes on significance only within the context in which the knower perceives the experience.

Benner (1983) found that expert nurses recognize subtle physiological changes and the need for imminent resuscitation efforts in patients prior to apparent objective signs. This recognitional ability was found to be context-dependent. In other words, the subtle changes are only significant within the context of the patient's present situation and past history. Benner stated that nurses learn such qualitative distinctions by having the subtle changes

pointed out to them in specific, contextual similar and dissimilar situations.

The nurses in Pyles and Stern's study (1983) reported various ill-defined cues (e.g., "the look of the patient," "mental changes," etc.) which they used in deciding whether or not the patient was exhibiting early cardiogenic shock. Each cue served as a premonitory signal but nurses made the final diagnosis of cardiogenic shock on the basis of several cumulative cues. All experienced nurses reported the use of sensory perception to diagnose cardiogenic shock. Sensory perception was unrelated to clinical cues and was either patient intuition or nurse intuition. Sensory perception was defined as a vague forewarning that something bad was going to happen. Expert nurses acted on the clinical cues and sensory perception, whereas nonexpert nurses did not know what to do with such information and therefore discarded it from the decision making data (Pyles & Stern, 1983).

Using Nursing Gestalt, the experienced nurses in Pyles and Stern's study (1983) could correctly diagnose impending cardiogenic shock. However, the investigators found that critical care nurses had difficulty communicating the Nursing Gestalt to physicians. Patient outcomes depended on the nurses' abilities to communicate their findings and to receive appropriate responses from physicians. The study

nurses reported difficulty in conveying clinical cues and sensory perceptions to physicians, and physician difficulty in understanding and responding to these clinical cues and sensory perceptions (Pyles & Stern, 1983).

Pyles and Stern's (1983) Nursing Gestalt can be equated with Benner's phenomenon of perceptual abilities seen in proficient and expert nursing practice (Benner, 1982, 1983, 1984; Benner & Wrubel, 1989). Benner asserted that perceptual awareness begins with vague hunches. Expert nurses often described the phenomenon as "gut feeling," "a sense of uneasiness," or a "feeling that things are not quite right" (Benner, 1984, p. xviii). They could anticipate deterioration in the patient's condition before evidence of objective, measurable signs appeared. Benner related multiple examples that this recognitional ability of expert nurses makes a critical difference in patient outcomes. However to benefit the patient, the gestalt of anticipated deterioration must be effectively linked with the nurse's ability to get an appropriate response from the physician (Benner, 1984).

Smith (1988) grouped the 13 themes in her data on clinical deterioration of critically ill patients into three characteristic clusters of deterioration: (a) an initial felt sense that something was wrong with the patient, (b) an awareness of imminent change in the patient's status toward

instability or crisis, and (c) the necessity of the nurse seeing or being with the patient to perceive deterioration. A sense of knowing was evoked in the nurses, even though the nurses were uncertain about the specifics that were imminent. This sense of knowing incited anticipation, preparedness, and heightened search for objective signs of change in patient status (Smith, 1988).

The subjects in Smith's study (1988) also referred to the difficulty they had communicating their subjective sense of knowing to physicians. A relationship was hypothesized between expertise of the nurse and physician response. The more clinically expert the nurse, the more the nurse was able to achieve the necessary physician response. The expert nurse used confrontation and other strategies to elicit the desired physician response (Smith, 1988).

Until recently, clinical nursing judgment has been studied within the perspectives of decision theory and information-processing theory. Studies within both perspectives have been analytical and described isolated, linear components of the judgment process. An assumption underlying both perspectives is that the clinical judgment process derives from elemental analysis of a situation comprised of selecting alternatives, collecting data to reduce uncertainty about the alternatives, and selecting the most likely alternative. Studies of clinical judgment

within both perspectives have used simulated conditions (Tanner, 1983).

Benner and Tanner's approach (1987) to the study of clinical judgment led to a Gestalt view of the clinical judgment process and supported that expert judgment derives from a grasp of the whole situation. Expert critical care nurses were found to use a perceptual assessment which differs from the objective, analytical judgment of decision theory and information-processing theory. The phenomenological perspective used by Benner and Tanner (1987) demanded study of clinical judgment in the natural environment and the examination of contextual factors associated with the judgment process.

Benner and Tanner (1987) found intuition to be an essential aspect of clinical judgment in expert critical care nursing practice. They defined intuition as understanding without a rationale. Key aspects, operating synergistically, were deemed to be necessary for expert intuitive judgment. These aspects included pattern recognition and similarity recognition.

Pattern recognition was defined as the perceptual ability to recognize relationships without specifying the situational components objectively (Benner and Tanner, 1987). Novice nurses were unable to identify a clinical pattern without the slow, deliberative use of analytical

models. Expert nurses, however, were able to identify patterns instantly. The patient's history and the expert nurse's expectations of how the patient would do were found to influence the ability to see particular aspects of the patient's condition as more salient than others.

Similarity recognition was defined as the ability to recognize resemblances despite marked differences in the objective features of past and present situations (Benner and Tanner, 1987). An awareness that a particular patient responds either similarly or dissimilarly to other patients cared for raises questions and possibilities. Similarity recognition depends on past experiences with similar types of patients. Therefore, the novice nurse cannot possess this skill.

Young (1987) used the grounded theory approach to study intuition in clinical nursing. Forty-one registered nurses in a variety of clinical settings were observed or interviewed. Seventy-five descriptive incidents were collected. Three functional dimensions of clinical intuition were identified: cues, judgment, and validity.

Cues were defined as the subjective and objective information the nurse used to make a decision. Cues were generally intangible, subjective, and inexplicable data. Judgment was defined as what the nurse knew or did as a consequence of the cues. The nurses' actions showed no

evident patterns. Judgment was frequently very specific in spite of global, subjective cues. Validity was defined as the correctness of the judgment. The nursing actions taken by the subjects were not a logical consequence of the objective data. Young (1987) hypothesized that this indicated a subjective, intuitive component to the decision making. Of the known results of the incidents, 92% were categorized as correct decisions. This contrasts markedly with the studies on clinical nursing judgment with the decision theory and information-processing perspectives. Less than 60% of the decisions were classified as correct using decision theory or information-processing theory (Tanner, 1983).

The data in Young's field study (1987) repeatedly demonstrated that the origin of clinical intuition is personal knowledge. Young used personal knowledge after Polanyi (1962) and identified five attributes that facilitate intuition: direct patient contact, self-receptivity, experience, energy, and self-confidence.

Direct patient contact, although unspecified in nature, was a requisite for intuitive judgment. Detailed descriptions with recall of their own feelings and the patients' feelings were given by the nurse subjects. Young (1987) suggested that as nurses become more consciously involved with intuitive experiences, there may be

improvement in their judgment. Self-receptivity was the ability to be open and vulnerable; it allowed the intuition to happen. Self-receptivity required the nurse to be unencumbered by personal or emotional problems. It was only possible when the nurse was emotionally available to receive information.

Young posited that experience imprints knowledge. This position is shared by existential philosophers (Heidegger, 1949, 1982; Polanyi, 1962; Barrett, 1962; Kaufmann, 1975). Clinical intuition is not a form of a priori knowledge. Instead, it is a consequence of several integrated variables. Experience provides the necessary, albeit insufficient (Heidegger, 1949, 1982; Barrett, 1962), basis for awareness and perception that permits cues to be recognized and decisions to be made. Experience, and associated acquired skills, permit intuitive judgment to be improved through reflection on prior decisions.

Energy was involved in intuitive clinical judgment. The nurse required available energy to perceive, integrate, and act on cues. Energy was defined as a readiness on the nurse's part to receive information. Energy was less available, or not available at all, when the nurse was ill or preoccupied with other problems (Young, 1987). The final attribute identified was self-confidence. This was defined as confidence in the validity of one's intuition. Nurses

who possessed this attribute were comfortable with the vagueness, incompleteness, and lack of objectivity in both their data and decisions (Young, 1987).

Rew (1988) explored the intuitive experiences of nurses in critical care and home settings. Fifty-six nurses were interviewed. Data analysis showed themes consistent with the attributes of intuition in the nursing literature. The nurses described their intuitive experiences in both global and specific terms. Rew categorized the descriptions into cognitive inference, Gestalt intuition, and precognitive function. The majority of subject responses fell into the categories of cognitive inference and Gestalt intuition. Rew had difficulty differentiating between these two categories. Phrases used by the respondents could be interpreted either as meaning that cues were processed so rapidly that the process of cognitive reasoning was veiled (cognitive inference) or that a pattern emerged within the context (Gestalt intuition).

The consequences of intuition varied according to the situation. If the situation was life-threatening, the nurses looked for supporting, objective data and acted to prepare for an emergency. Rew(1988) found that the nurse's response to intuition was affected by previous experience with the patient's physician. Nursing actions identified as consequences of intuitive experiences were gathering

additional data, validating with another nurse, reporting the findings and feelings, and intervening.

In contrast to the other studies cited, Baumann and Deber (1989) studied rapid decision making in 40 critical care nurses from the perspective of decision theory. They used six case vignettes designed to reflect clinical situations that required rapid decisions. The subjects were given 30 minutes to determine the immediate decisions they would make in all six cases.

The results of the study suggested that decision theory is difficult, if not impossible, for rapid decision making. In crisis situations, unexpected events make the problem difficult to define and prohibit the use of standardized alternatives. Furthermore, the researchers found it problematic to apply decision theory to process-oriented nursing interventions. They pointed out the absence of a clear relationship between nursing intervention and patient outcome. They found that nursing interventions were not mutually exclusive and it was difficult to separate the effects of interdependent interventions involving other health care providers (Baumann & Deber, 1989). This recent study provided confirmation that decision theory and information-processing theory do not capture the essence of decision making in critical care nursing practice.

The studies discussed in this section emphasized the core role of context-dependent perception in the acquisition of skilled knowledge. The studies suggest that advancement along the novice to expert performance continuum is dependent on the development and refinement of perceptual awareness. Qualitative distinctions of subtle and differential changes in the patient's condition, that both herald deterioration and precede objective findings, are made by expert critical care nurses. Nonexpert nurses do not have well-developed perceptual abilities and therefore are unable to make qualitative distinctions regarding the patient's condition.

Pursuit of Purpose

The concept of pursuit of purpose is grounded in the existential tenet of potentiation of possibilities (Heidegger, 1949, 1982). Personal knowledge has its roots in the subsidiary awareness of the body as merged in the focal awareness of external objects. Subsidiary awareness may be seen as instrumental means and focal awareness the desired result or ends. Polanyi (1962) discussed the change observed in the behavior of a rat when it has learned to run a maze. The animal ceases to explore the details of the walls and corners on its way and attends to these now merely as signposts. The rat seems to have lost its focal

awareness of the maze details and developed instead a subsidiary awareness of them which now forms part of the pursuit of its purpose.

Tools, skills, signs, and symbols are examples of the merging of things in a whole in which they are assigned a subsidiary function and a meaning in respect to something that has one's focal attention. Polanyi argued that this merging is not accomplished without effort. One must concentrate on a chosen plane of operation to succeed in absorbing all the elements of the situation of which one might otherwise be aware of in themselves, so that one now becomes aware of them in terms of the operational results achieved through their use (Heidegger, 1949; Polanyi, 1962). As one learns to master a situation, one becomes unconscious of the actions by which the result is achieved. This is not, Polanyi argued, the mere result of repetition. It is a structural change achieved by a repeated mental effort at the instrumentalization of certain actions in the service of some purpose.

Benner (1983) found that expert nurses develop common meanings about human situations in their practices. For example, expert nurses were found to attempt to develop a sense of possibility for their patients. A sense of possibility included coping options and meaning in illness.

The expert nurses in Benner's (1983) study developed global assumptions and expectations about patients that are not part of formal knowledge. These assumptions and expectations constituted an orientation toward the patient situation that predisposed the nurse to act in a particular way that could not be explicitly described. The experts used instructions that make sense only to the person with a deep understanding of the situation. Expert nurses were found to develop paradigm cases about particular patient situations and to use these paradigm cases to guide their actions in other patient situations.

Benner and Tanner (1987) found commonsense understanding and deliberative rationality to be aspects of expert clinical decision making in critical care nursing practice. They defined commonsense understanding as a "deep grasp of the culture and language". Nurses, over time, develop an understanding of the illness experience - the lived experience for the patient with the illness - in contrast to knowing only the disease facts. This skill permits a grasp of the individual patient's context. Observations of how the patient looks and possibilities of how the patient might look have relevance to the illness experience. Benner and Tanner (1987) defined deliberative rationality as the consideration of alternative perspectives in clinical decision making. It is interpreting the

situation from a different viewpoint to see whether different facts stand out as salient. Deliberative rationality permits experts to maximize judgment without being limited to a single interpretation.

Benner's (1983) finding of assumptions and expectations in expert nursing practice and Benner and Tanner's (1987) identification of commonsense understanding and deliberate rationality in clinical decision making of critical care nurses with skilled knowledge relate to Polanyi's (1962) concept of pursuit of purpose. While the data are limited, a proposition is implied: Critical care nurses with skilled knowledge who practice at the expert level of the performance continuum see possibilities for the patient and, further, potentiate possibilities for the patient.

Master-Apprentice Relationship

Polanyi (1962) referred to a well-developed perceptual grasp as "connoisseurship." According to Polanyi, connoisseurship can be communicated only by example, not by precept. To become an expert, one must go through a long course of experience under the guidance of a master. Polanyi stated that wherever connoisseurship is found operating within science or technology it may be assumed that it persists because it has not been possible to replace it by a measurable grading. Since measurement has the

advantage of greater objectivity, it is used whenever such objectivity can be achieved. He offered as an example that the large amount of time spent by students of chemistry, biology, and medicine in their practical courses shows how greatly these sciences rely on transmitting both skills and connoisseurship from master to apprentice. This is an impressive demonstration of the extent to which the art of knowing has remained unspecifiable at the very heart of science (Polanyi, 1962).

Polanyi (1962) asserted that the aim of skillful performance is achieved by adherence to rules which are unknown to the performer. Since the rules cannot be specified in detail, they cannot be transmitted by prescriptions. They can be transmitted only personally such as from master to apprentice. To learn by example is to submit to authority. The master is followed because the apprentice trusts the expert's way of doing things even when the methods cannot be analyzed in detail. By watching the master and emulating those efforts in the presence of the master's example, the apprentice unconsciously picks up the rules of the art, including those which are not explicitly known to the master.

Benner (1983) and Pyles and Stern (1983) agreed with Polanyi's (1962) position that it is not possible to pass on personal knowledge by precept or didactic teaching.

Personal knowledge requires an understanding of the contextual situation that can only be transmitted by demonstration, attitudes, and reactions. Their research findings indicated that clinical experience is a primary antecedent to the development of a strong knowledge base and to the application of knowledge to practice. Data indicated that critical care nurses differ in their assessment ability and that knowledge gained from experience is a key factor in skilled assessment. However, experience alone is insufficient to result in skilled assessment. Nurses in their studies articulated their dependence on an experienced nurse to help them recognize and interpret clinical assessment findings (Benner, 1983; Pyles & Stern, 1983).

Summary

Knowledge and skill acquisition was the area in the literature reviewed for the purposes of the study. Using the framework of existentialism, knowledge and skill acquisition are understood within the context of four doctrines put forth by Heidegger (1949): (a) the person and environment are inseparable, (b) the person exists through participation and involvement in the world, (c) action and knowledge are inseparable, and (d) personhood is oriented toward future possibilities.

Personal knowledge (knowing how) is a way of knowing reality that requires synthesis of the person's passionate involvement and intellectual powers. This synthesis permits knowing to permeate the individual's being in such a way that the individual is only subsidiarily aware of the knowledge. Thus, the person can focus energy on another thing (focal awareness) without drawing the knowledge in subsidiary awareness to the forefront of consciousness (Polanyi, 1962).

The acquisition of personal knowledge requires purposeful effort and well-developed perceptual abilities. The person must be involved in a situation of intense interest and actively absorb the elements of the situational context. The acquisition of personal knowledge is a learned behavior, with the prerequisites being intense involvement and the ability to mentally organize relationships among phenomena.

Since personal knowledge resides in the person's subsidiary awareness, the details of the knowledge cannot be specified; thus, they cannot be transmitted to others by prescription. The knowledge can only be transmitted personally, such as from master to apprentice. By watching and emulating the master, the apprentice unconsciously acquires the knowledge and skills of the master.

A requisite for the development of personal knowledge is an orientation toward possibilities. The knowledge and skill must be viewed within a broader context than simply acquisition. In other words, the learner mentally must determine "Acquisition for what purpose?" An envisioned result prompts the acquisition of personal knowledge. It is contradictory to develop the subsidiary awareness of personal knowledge by focusing on it. Personal knowledge is acquired as a means to some other end.

The findings of Benner (1982, 1983, 1984; Benner & Wrubel, 1989), Pyles and Stern (1983), and Smith (1988) were congruent with Polanyi's (1962) personal knowledge as a way of knowing. They supported Heidegger's views on the unity of person and environment, involvement, the relationship of action and knowledge, and the potentiation of possibilities. The studies on clinical decision making in nursing practice (Benner & Tanner, 1987; Young, 1987; Rew, 1988; Baumann & Deber, 1989) substantiated the role of perceptual ability in discretionary judgment and either supported (Benner & Tanner, 1987; Young, 1987) or implied (Rew, 1988; Baumann & Deber, 1989) that the origin of perceptual ability is personal knowledge.

The nursing research reviewed in this chapter established experience in the Heideggerian sense as requisite to knowledge and skill acquisition in clinical

nursing practice. The acquisition of skilled knowledge was shown to lead to appropriate nursing actions and to differentiate levels of expertise in nursing practice. The acquisition of skilled knowledge was demonstrated to be context-dependent, suggesting that the acquisition of personal knowledge must occur in the clinical setting.

The nursing research posited that the knowledge and skills that constitute the essence of critical care nursing practice cannot be taught by precept. They can be learned "on the job" by the perceptive nurse who is intensely involved in a patient situation and potentiates possibilities. Further, the acquisition of personal knowledge can be facilitated by a master to apprentice relationship between an expert nurse and a less skilled nurse.

CHAPTER III

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

The domain of study was the identification of the factors in the process by which an expert nurse advanced the practice and decision making of bedside nurses in a medical critical care unit. Little is known about how to advance critical care nurses along the novice to expert continuum of clinical nursing practice (Benner, 1990; Daly & Boller, 1990). Thus a qualitative research approach was considered appropriate for the study domain. In this exploratory research, the little-understood phenomenon of the relationship between expert and nonexpert critical care nursing practice and patient outcomes was investigated, variables in the process by which an expert nurse influenced the practice of bedside nurses were identified, and hypotheses for further research were generated. The research strategy used was the grounded theory field study. The data were collected in a previous study (Goodnough, Bines, & Schneider, 1986, 1988) which demonstrated that the nurses in the medical

critical care unit (MCCU) reduced the incidence of preventable complications in the MCCU patient population after six months of exposure to a unit-based expert nurse. Data collection techniques included observation, participant observation and informal, in-depth interviewing.

Grounded theory is a highly systematic research approach to generate explanatory theory that furthers the understanding of social phenomena (Glaser & Strauss, 1965, 1978; Stern, 1980, 1985; Field & Morse, 1985; Chenitz & Swanson, 1986; Munhall & Oiler, 1986). In grounded theory, the investigator searches for social processes present in human interactions derived from empirical data. Grounded theory assumes the existence of a process (Field & Morse, 1985). The objective of grounded theory is the development of theory that explains basic patterns common in the natural setting. These fundamental patterns, known as core variables (Stern, 1985) or basic social-psychological processes (Hutchinson, 1986; Chenitz & Swanson, 1986) account for variation in interactions surrounding a phenomenon.

Grounded theories may be formal or substantive (Hutchinson, 1986). Formal theories address a conceptual level of inquiry. Substantive theories are generated from a specific, circumscribed, and empirical area of inquiry. The development of substantive, or middle-range (Chenitz & Swanson, 1986), theory was the aim of this study. The core

variables that were the most relevant factors in the human behavior of expert nurse-bedside nurse interaction and that explained the expert nurse influence on nonexpert nurses to improve the quality of patient outcomes were conceptualized.

The grounded theory method of organizing and analyzing data from the empirical world of critical care nursing provided the means to conceptualize the interacting influences of the expert nurse, nonexpert nurses, patient outcomes, and the structural and cultural circumstances of the medical critical care unit.

Setting

The setting for this study was a South Central city in the United States with a metropolitan area population of over 3 million persons. The data were collected from a 650 bed private, not-for-profit teaching hospital. The hospital is located in the central part of the city within a medical complex that consists of 38 academic, clinical, and research agencies.

The hospital is affiliated with a medical school and serves as a clinical teaching site for students in nursing, allied health, dentistry, public health, medicine, hospital administration, biomedical sciences, and other health care-related programs. The hospital offers comprehensive primary, secondary, and tertiary care services including a

Level I trauma center with helicopter and fixed-wing air ambulance service and a Level III neonatal intensive care unit.

Concurrent Study

In 1984 - 1985, the investigator conducted a research project, entitled the Clinical Advancement of Professional Practice. A nonequivalent control group pre-test/ post-test quasiexperimental design was used to test the hypothesis that the presence of a unit-based expert nurse in the critical care unit will reduce the incidence of preventable pulmonary complications (PPC).

Preventable pulmonary complications consisted of noncompression atelectasis, inadvertent extubation, and malpositioned endotracheal tube - potential complications of critically ill patients that can be anticipated and prevented by independent nursing actions. Two critical care units of comparable size and staffing, but different patient populations, were selected for participation in the study. The intervention was a unit-based Clinical Nurse Specialist assigned to the experimental unit to work with the nursing staff for six months. The Clinical Nurse Specialist was assigned randomly to the Medical Critical Care Unit (MCCU). The Surgical Critical Care Unit (SCCU) became the control unit.

Pre-test data were collected, using retrospective chart audit, from the MCCU and SCCU patient populations for three months prior to the intervention. The pre-test data on the incidences of PPC were shared with nursing and physician staffs of both the experimental and control units. Post-test data were collected, again using retrospective chart audit, from the MCCU and SCCU patient populations for three months after the intervention. The months of pre-test and post-test data collection were held constant to control for seasonal variations in illness/injury and housestaff seniority.

The intervention effects on two of the preventable pulmonary complications were clinically and statistically significant (Goodnough, Bines, & Schneider, 1986, 1988). The incidences of inadvertent extubation and malpositioned endotracheal tube were reduced in the MCCU post-test. In contrast, the incidences of all PPC were unchanged between the SCCU pre-test and post-test. The change in MCCU incidences were associated with statistically significant increases in the acuity and risk factors in the post-test MCCU patient population compared to the pre-test MCCU patient population. The investigators concluded that a unit-based expert nurse influenced the practice of MCCU nurses to reduce the incidences of inadvertent extubation and malpositioned endotracheal tube.

An explanation of how and why the presence of a unit-based expert nurse reduces preventable pulmonary complications was not evident from the literature. Therefore, this qualitative study was designed to occur simultaneously with the quantitative study. The principal investigator assumed the dual role of researcher/unit-based expert nurse. The investigator collected the data for this study during the six-month intervention for the quantitative study.

Population and Sample

The Division of Nursing in the selected hospital had over 1,500 employees, of which 1,000 were full-time equivalents (FTEs) and just under 800 were registered nurse FTEs. The division was organized into the following departments, with a Nursing Administrative Director over each department: Surgical and Renal, Medical and Psychiatric, Maternal and Child Health, Emergency and Ambulatory Care, and Education and Research. Each department consisted of several units, or product lines in the case of Education and Research. Each unit had a head nurse and two to three assistant head nurses.

Nursing education and research services were centralized. There were 8.5 FTE staff development instructors. One instructor was responsible for agency-

mandated inservices, orientation, and continuing education for each service. Three and one-half FTE instructors had primarily decentralized responsibilities. A .5 FTE instructor was responsible for research. One instructor coordinated internship, externship, and collaborative accelerated degree programs. The remaining two instructors were responsible for the performance-based development system (PBDS, Baxter-Travenol), a self-paced learning laboratory.

The Division of Nursing had a career development incentive system which had been in place approximately two years at the time of data collection (Weeks & Vestal, 1983). The system had six clinical levels. All performance standards required for a lower level were cumulative to the next level.

Registered Nurse (RN) I was the beginning level for RNs with less than one year's experience who were developing clinical skills. RN II required greater than one year of nursing experience and undefined competence in clinical practice. The majority of bedside nurses were at this level and remained at this level during their hospital tenure. RN III required excellent clinical skills (also undefined) and that the RN function as a clinical resource for the unit. RNs in these positions were called "preceptors" and were responsible for orientation of new staff to the unit. RN IV

positions additionally required quality assurance monitoring responsibilities. There were two or three filled RN IV positions in the clinical tract. RNs in the fifth level were called Clinicians and had the same requirements as Level IV RNs with the distinction being that the RN V was service-based (e.g., medicine, surgery, pediatrics, etc.) rather than unit-based. There were less than six filled RN V positions. The RN VI was defined as an expert nurse, called a Clinical Nurse Specialist, had hospital-wide responsibilities and served as a clinical role model. There was one RN VI in the Division of Nursing.

Critical care beds constituted approximately one-third of the agency beds. There were eight adult critical care units varying in size from four to 18 beds and four neonatal and pediatric critical care units varying in size from four to 20 beds. Eight critical care units were for homogeneous patient populations (e.g., cardiac surgery, burn, pediatric renal, adult renal, etc.). The medical, surgical, pediatric, and neonatal critical care units were for heterogeneous patient populations. None of the critical care units had a unit-based Clinical Nurse Specialist.

The medical critical care unit (MCCU) had ten beds. Neurological, medical gastrointestinal, acute respiratory failure, and sepsis/shock were the most frequent diagnostic

categories of MCCU patients (Goodnough, Bines, & Schneider, 1986, 1988).

The medical direction of the unit at the time of data collection was complex and cumbersome. Twelve teaching teams, organized by medical specialty (e.g., pulmonary, hematology, oncology, cardiology, etc.), were responsible for the medical care of the MCCU patients. Although the pulmonary team was ostensibly available for triaging and overall management of the patients, actual medical decision making was delegated to the housestaff on each of the 12 teaching teams.

The sample consisted of the group of critical care nurses working in the medical critical care unit (MCCU) between mid-July 1984 and January 1985. Twenty-six subjects were observed and interviewed. There were 22 filled positions from a total 26 authorized and 34 budgeted positions for MCCU staff. The positions were filled as follows: one Head Nurse, two Assistant Head Nurses, four RN IIIs, eight RN IIs, four RN Is, and three unit secretaries. The Head Nurse worked basically day shift hours and the other RNs worked twelve hour shifts.

Primary nursing was officially the care delivery system used in the MCCU and throughout the institution, but it rarely was practiced true to form. MCCU nursing staff turnover had been high (> 80%) prior to data collection and

there had been three head nurses in the preceding two and one half years. Patient care assignments were made by the Assistant Head Nurses with the most experienced nurses being assigned the more critically ill patients.

Protection of Human Subjects

The study was exempt from review by the Texas Woman's University Human Subjects Review Committee because the research fell within the research categories of interview research, public behavior research, and research involving the study of existing data (Appendix A). The data collection received expedited administrative review by the human subjects review committee of the clinical agency in which the data were collected (Appendix B). Informed consent was not required.

Prior to data collection, the MCCU staff were told that the researcher was studying the results of specific patient outcomes after a unit-based Clinical Nurse Specialist worked with the unit staff for six months and that the researcher would be collecting data about the processes in nursing practice. The following protective mechanisms were stated:

1. The identities of the participants are kept confidential by the researcher/Clinical Nurse Specialist.
2. No actual names are associated with the reported data.

3. There are no right or wrong behaviors.

4. The nurse's agreement to share information with the researcher/Clinical Nurse Specialist constitutes informed consent.

Instrumentation

The methods used to collect empirical data regarding critical care nursing practice and patient outcomes were: (a) observation and recording of descriptive data, (b) recording direct quotes of participants, (c) unstructured interview, and (d) written records. The first three methods provided essential information to identify the patterns and domains of interest to the researcher. The fourth method provided a check on the reliability of the observed data (Marshall & Rossman, 1989).

Observations and in-depth interviews are the fundamental data collection techniques of the qualitative researcher (Becker, 1958; Glaser & Strauss, 1965, 1978; Marshall & Rossman, 1989). Observation entailed the systematic description of events and behaviors in the Medical Critical Care Unit (MCCU). Participant observation demanded immersion in the setting to allow the researcher to experience reality as the study participants did (Becker, 1958; Leininger, 1985). Multiple observations of the interactions of MCCU staff with each other, patients and

families, other health care providers, and the investigator were made over six months.

In-depth interviewing is described as an interaction involving the interviewer and interviewee, the purpose of which is to obtain valid and reliable information (Marshall & Rossman, 1989). In-depth interviews range from casual conversation or brief questioning to formal, lengthy interviews. The interviews in this study were "conversation with a purpose" (Becker, 1958; Marshall & Rossman, 1989) and questioning regarding the context of the clinical situation in the MCCU. Additional data were collected from patient records, organizational charts, hospital policies, and study unit records.

Validity and Reliability

Qualitative procedures are judged on two criteria: informational adequacy and efficiency. Informational adequacy refers to the assurance that the researcher understands the setting thoroughly and accurately (Marshall & Rossman, 1989). Efficiency refers to the data being collected at an acceptable cost in terms of time, access, and cost to participants (Marshall & Rossman, 1989). The dual roles of the investigator as researcher/Clinical Nurse Specialist ensured that both criteria were met.

The investigator was an employee of the setting and was assigned to the MCCU for six months for the purpose of conducting research. While new to the study unit, the investigator had a long history of critical care nursing experience and became integrated into the MCCU milieu two weeks into the data collection. The field notes indicate that the MCCU staff saw the investigator primarily as the Clinical Nurse Specialist. The investigator was able to conduct the research as a full fledged member of the study unit which guaranteed a thorough and accurate understanding of the setting (Becker, 1958; Archbold, 1986).

The dual role of the investigator promoted efficiency by virtue of the feedback, attention, help, and teaching provided to the participants by the investigator and by virtue of the reduction in patient complications during and after the unit-based assignment (Goodnough, Bines, & Schneider, 1986, 1988).

Grounded theory is subjective research; however, several strategies were used to minimize undue investigator bias. The data were collected primarily by participant observation. The field notes reflect that the researcher/Clinical Nurse Specialist initially influenced the natural setting of the medical critical care unit (MCCU) in an artificial way. The longer the investigator was in the setting, the more social and organizational constraints

neutralized this effect. At some point between three days and two weeks into the data collection, the investigator became part of the MCCU culture. This was evidenced by the use of plural pronouns (e.g., we, us, ours, etc.) by the investigator and MCCU staff alike.

Archbold (1986) referred to the "power differential" between researcher and participant in qualitative research. The subjects may discontinue interaction, resist questioning, withhold information, or distort information at any time during data collection. The risk of this power being exercised is greater if the participant subjects see the researcher primarily in the researcher role (Becker, 1958). If the researcher conducts the research as a full-fledged member of the group, knowledge and behavior that would normally be withheld from an outsider are shared with the researcher. The fact that the MCCU staff saw the researcher primarily as the Clinical Nurse Specialist strengthened the validity of the data collected. The researcher may properly interpret her own experience in the MCCU as that of a typical group member (Becker, 1958).

The salience of the clinician role of the researcher/Clinical Nurse Specialist has implications for validity of the data. Data collection and intervention were one process. The MCCU staff's views of phenomena may have been changed because of interactions with the Clinical Nurse

Specialist. However, changing MCCU staff behaviors was the domain of inquiry in the proposed study. It was precisely the interaction of staff and expert nurse, and the effect that such interaction had on patient outcomes, that was studied.

The temporal reality of field work provides an additional validity check on the data (Hutchinson, 1986). The grounded research is conducted in the field over a protracted period of time. The data were collected over a six-month period. The researcher was in the field full-time for the six months.

A reliability issue in qualitative research is whether a theory generated in a specific context can be generalized to a larger or different group. Reliability in qualitative research focuses on identifying and documenting recurrent, accurate, and consistent or inconsistent features of the phenomenon (Leininger, 1985). A quality theory that accurately identifies a core variable will be relevant to people in general (Hutchinson, 1986). The patterns and themes that emerge can be confirmed in similar, and perhaps even in different, contexts.

A grounded theory study cannot be replicated (Stern, 1985; Leininger, 1985; Hutchinson, 1986; Chenitz & Swanson, 1986). Hutchinson (1986) argued that the issue of replicability is not particularly relevant since the point

of theory generation is to offer a new perspective on a given situation. The theory generated is testable; the discovered processes or core variables are timeless; and the reliability and consistency of data are, in part, accounted for by the duration of field research. Thus, although grounded theory is not replicable, it has reliability and predictability.

Data Collection

Data collection in grounded theory follows the pattern of the field research traditionally practiced by anthropologists and sociologists who lived in the field (Glaser & Strauss, 1965; Hutchinson, 1986). The investigator chose the critical care unit as the setting to study and immersed herself in that environment. The researcher combined the data collection with a six-month intervention to reduce preventable pulmonary complications in the medical critical care unit (MCCU).

Field notes were taken about the researcher/Clinical Nurse Specialist's observations of and interactions with the nursing staff throughout the intervention. Notes were taken immediately after an observation. The researcher tape recorded the full details of the observations approximately every four hours throughout the work day. The taped recordings were transcribed and checked for accuracy. The

transcribed notes constitute several hundred pages of typed field notes. The focus of the observations was broad since the domain of study was diffuse and exploratory. A holistic view of the nursing practice and decision making was sought.

The observations and interviews were used to understand and describe the typical social structure and observed patterns of behavior in the critical care unit. These observations formed the matrix from which the process of how an expert nurse influenced nonexpert nurses to improve the quality of patient outcomes was derived.

Treatment of Data

Data analysis is the heart of the grounded theory method. It occurs in a matrix with data coding, concept formation, concept development, concept modification, and theory integration often occurring simultaneously (Glaser & Strauss, 1965, 1978; Stern, 1980, 1985; Hutchinson, 1986; Chenitz & Swanson, 1986; Munhall & Oiler, 1986; Burns & Grove, 1987; Burns, 1989). The treatment of data focuses on the analysis of different and identifiable themes and patterns of behavior. The raw data are analyzed by identifying and integrating fragments of ideas and experiences, which are often meaningless when viewed alone. The total gestalt, or coherence of ideas, rests with the researcher.

Throughout the process of theory generation, the researcher looked for contradictory data and checked the frequency and distribution of emerging phenomena. Discovered events that prompted the development of provisional concepts were contrasted and compared to see if they were typical and widespread. Evidence of the frequency, the distribution, and the variety of events to support emerging concepts strengthened the validity of the study.

The process of data analysis included the steps outlined by Hutchinson (1986): coding the field notes; memoing; theoretical sampling; sorting; and saturation of codes, categories, and constructs. Each step is discussed below.

The field notes were coded with three levels. Level I codes were substantive codes and consisted of the actual words used by the study participants. They were words that described the actions in the natural setting. The level of coding was based only and directly on the data and therefore prevented the researcher from imposing preconceived impressions onto the data. Each sentence and each incident were put into as many codes as possible to insure full theoretical coverage. Level I codes broke the data into small pieces.

Level II codes were categorical codes. Level I codes were condensed into larger categories. Decisions about categories were made by asking questions of the data, such as "What does this datum indicate?" "What category contains these similar data?" Each of the Level I codes were compared with each other and each emerging category was compared with each other, to ensure they were mutually exclusive and covered the behavioral variations.

Level III codes were theoretical constructs. They were derived from formal and personal knowledge (Polanyi, 1962). Level III codes contributed theoretical meaning and scope to the theory (Glaser & Strauss, 1978). The theoretical constructs were grounded in substantive and categorical codes to preclude the possibility of unfounded abstract theorizing.

Structure to the data analysis was provided by continuously asking questions during the coding about causes, contexts, contingencies, consequences, covariances, and conditions. The six "C" questions (Glaser & Strauss, 1978; Hutchinson, 1986) helped the researcher assess the dimensions, phases, ranges, and boundaries of the emerging process. The fundamental aim of coding was to discover the core variable and its related properties. The majority of codes were substantive codes, with a great number of categorical codes and few theoretical codes.

Memoing was the step that elevated the empirical data to a theoretical level (Hutchinson, 1986). Any theoretical notions, however fleeting, the researcher had about the data were recorded immediately and labeled with the codes to which they related. The emphasis of memoing was on the conceptualization of ideas. Hundreds of memos were generated as memos were modified and memos on memos accumulated. The thought process in this step was both inductive and deductive. The researcher conceptualized when memoing and then deduced how the concepts integrated.

In grounded theory, sampling decisions are made throughout the research process. Data may be gathered from any group or document which can provide relevance to the emerging theory. Theoretical sampling expands and elaborates the developing codes and ensures a data base sufficiently extensive to explain the ranges and boundaries of behavior in the domain of inquiry. Theoretical sampling in this study was done from the literature, the researcher's past experiences, and discussions with others.

Identification of the core variable occurred during the memoing and sorting steps. The core variable provided focus and direction to the sorting process. The codes and memos were sorted to discover the relationship of the three levels of codes to the core variable. All memos were separated by code, delineating the dimensions, phases, ranges, and

boundaries of the theoretical constructs. The relationships among the individual constructs and their collective relationship to the core variable were analyzed. These relationships became the framework of the theory. The aim of sorting was to organize the piecemeal data into a coherent and parsimonious whole (Glaser & Strauss, 1978). This step in the data analysis facilitated the creation of a theoretical framework that integrated the core variable.

Saturation is the point at which all levels of codes are complete. No further knowledge or conceptualization results in new codes or the expansion of existing codes. This step represented closure of data analysis. Saturation occurred when all the data fit into the established categories, patterns were clear, behavioral variations were described, and behavior was predictable (Hutchinson, 1986).

Summary

The grounded theory method of qualitative research was used to identify the factors in the process by which an expert nurse influenced the practice of bedside nurses to improve the quality of patient outcomes in a medical critical care unit. A qualitative approach was indicated because little is known about how to prepare critical care nurses to practice competently. Generating substantive theory from empirical data suggested directions for

alternative methods of preparing and developing nurses to practice competently in today's complex critical care environment. The grounded theory method as outlined by Hutchinson (1986) and long advocated by Glaser and Strauss (1965, 1978) was used.

CHAPTER IV

ANALYSIS OF DATA

In this study the grounded theory field approach was used to: (a) investigate the relationships between expert critical care nursing practice, nonexpert critical care nursing practice, and patient outcomes, (b) identify the factors in the process by which an expert nurse advanced the practice of nonexpert nurses to improve the quality of patient outcomes, and (c) to generate hypotheses regarding the development of critical care nurses. The description of the sample, the findings organized by core concepts, the emerging theory, and a summary of the findings are presented in this chapter. Field notes from participant observation and informal interview provide the illustrative data. The constant comparative analysis method provided the format for generating the core concepts and the emerging theory from the data.

Description of the Sample

The purposive sample consisted of the group of critical care nurses working in the medical critical care unit (MCCU) of a 650 bed private, not-for-profit teaching hospital

between mid-July 1984 and January 1985. Twenty-six subjects were observed and interviewed. The MCCU nurses ranged in age from 21 to 55 years; the mean age was 28.6 years. Two nurses (8%) were of Asian ethnic origin, three (11%) were Black, and 21 (81%) were Caucasian. All but one of the nurses were female. Years of critical care nursing experience ranged from none to fifteen, with a mean of 2.8 years. Twelve participants (46%) had a baccalaureate degree, seven (27%) had an associate degree, and seven (27%) had nursing diplomas.

Findings

The process by which an expert nurse advanced the practice of nonexpert nurses to improve patient outcomes was the phenomenon studied. The participant observation time was six months. One hundred twenty-two incidents were recorded in the field notes. These incidents involved 26 nurses and 31 patients from the medical critical care unit (MCCU).

The grounded theory matrix of data analysis was used (Glaser & Strauss, 1965, 1978; Stern, 1980, 1985; Hutchinson, 1986; Chenitz & Swanson, 1986; Munhall & Oiler, 1986; Burns & Grove, 1987; Burns, 1989). The discrete steps are discussed below; however, data coding, concept

formation, concept development, concept modification, and theory integration often occurred simultaneously.

First, the raw data were broken down into small fragments by identifying the actions in the setting (Level I, or substantive, codes). Each sentence and each incident were put into as many codes as possible. Nine hundred forty-three substantive codes were extracted from the field notes. Samples of Level I codes are given in Table 1. During Level I coding, the researcher recorded memos on theoretical notions suggested by the data.

Next the Level I codes were condensed into larger categories (Level II, or categorical, codes). The substantive codes were compared to each other. The researcher asked questions of the substantive codes, such as "What does this datum indicate?" "What category contains this datum?" "Is this datum similar to other data?" Eighty-four categorical codes were derived from the substantive codes. These categorical codes were compared to each other to ensure that they were mutually exclusive and covered the behavioral variations. Codes were combined, deleted, or added, which resulted in 52 final categorical codes. The categorical codes are presented in ascending order of frequency in Table 2.

Level III codes were derived from the data, formal knowledge, and personal knowledge (Polanyi, 1962) of the

Sample of Level I (Substantive) Codes

SN doesn't know clinical significance of the data collected.

CNS teaches SN interrelationships and clinical significance of hemodynamic data.

SN says junior house staff don't know how to interpret data and attending physicians are too busy or unapproachable.

CNS discusses therapeutic interventions with SN based on data collected.

SN takes data and suggests interventions discussed with CNS to house staff.

Intern orders interventions but neither he nor SN are comfortable with the interventions.

CNS discusses parameter changes and how the patient might look clinically if interventions are effective.

CNS discusses potential complications of the interventions that should be monitored with SN and house officer.

CNS evaluates patient response to the interventions with SN and house officer.

Patient awakens and continues to improve.

CNS refers further teaching and evaluation to hemodynamic nurse expert who then works with SN.

No hemodynamic parameters documented on critically ill patient for 10 hours.

Nurses said parameters are ordered at specific points in time to coincide with changes in vasoactive agent rate of administration.

CNS discusses value of trend data, particularly with titrated vasoactive infusions, with nurses.

Nurses say nobody (specifically the physicians) pays attention to the data and they don't have time to do them just for their own sake.

CNS = Clinical Nurse Specialist; SN = staff nurse

Level II (Categorical) Codes and Frequencies

Frequency	Code	Frequency	Code
3	Learning	11	Initiating/ instigating
5	Supervising	12	Comfort/confidence
5	Change agent	12	Diagnosing
6	Moving on things	12	Setting expectations and standards
7	Acting independently	14	Flexible strategies/ innovating
7	Admonishing	14	Problem solving/ trouble-shooting
7	Challenging	15	Anticipating
7	Listening	15	Intervening
7	Providing direct care	15	Planning
8	Conflict resolution	16	Coaching
8	Vigilance	16	Helping
8	Systems problems	16	Supporting
10	Assertiveness	17	Responding
10	Confronting	17	Suggesting
10	Mobilizing resources	17	Assuming responsibility for actions
10	Validating decision making	18	Following up
11	Having concern/ trusting	18	Influence

(table continues)

Level II (Categorical) Codes

Frequency	Code
19	Consultation
20	Gestalt, conceptual clarity
20	Developing staff professionalism
22	Interpreting
23	Collaborating
24	Questioning/inquiring
26	Observing
26	Providing rationale/ explaining
27	Communicating
30	Building team
35	Teaching/demonstrating
36	Ordering/directing
36	Evaluating
37	Identifying problems
39	Presencing ("being there")
44	Hypothesizing
44	Decision making
110	Assessing

investigator. Level III codes were theoretical constructs. The theoretical constructs were grounded in the data since they emerged from the substantive and categorical codes. Additionally, the generation of the theoretical constructs were influenced by the researcher's abstract and general (formal) knowledge from previous education, concrete and particular (personal) knowledge from past experiences, and the literatures on critical care nursing practice and decision making. The aim of Level III coding was to achieve as much diversity as possible in the emerging categories. The Level III constructs are presented in Table 3.

The categorical codes were analyzed for similarities and differences, and grouped into similar categories based on the supporting substantive codes and field note contexts. Seventeen theoretical constructs were derived. They were: challenge, clinical assessment, collaboration, credibility, diagnoses and orders, empowerment, flexible strategies, gestalt, hypothesis-testing, independent practice, presencing, decision-making, outcome orientation, redefinition of domain boundaries, teaching, team building, and validation.

Appendix D contains excerpts from the field notes, the categories that were grouped according to similarities, and the constructs that emerged. The field note excerpts in Appendix D represent only a sample of those used to support

Table 3

Level III Codes (Theoretical Constructs)

challenge

clinical assessment

collaboration

credibility

diagnoses and orders

empowerment

flexible strategies

gestalt

hypothesis-testing

independent practice

redefinition of domain boundaries

presencing

decision making

outcome orientation

teaching

team building

validation

the categories and constructs. The number of substantive codes identified from the field notes for each category is indicated in parentheses following each category. The parenthetical number following the construct is the sum of the frequencies of substantive codes in the categories from which the construct emerged.

The theoretical constructs were analyzed with the grounded theory steps of memoing, theoretical sampling, and sorting. Memoing is the step that elevates the empirical data to a theoretical level (Hutchinson, 1986). Theoretical notions that the researcher had about the data were labeled with the codes to which they related. The thought processes in this step were both inductive and deductive. The researcher conceptualized ideas and deduced how the concepts integrated. Theoretical sampling refined the developing categories. Data to support, expand, or reduce the categories were gathered from the broad (e.g., novels, newspaper articles, trade journals, etc.) and the specific (e.g., collaboration, mentoring, etc.) literatures. Data from recall and writings of the investigator's previous clinical experiences were used to refine the categories. Discussions with others also influenced the development of the categories. For example, discussion with a cab driver suggested the category of credibility and discussion with

Dr. Patricia Benner supported the category of diagnoses and orders.

The Core Concepts

Multiple possible core variables (Stern, 1985), or basic social-psychological processes (Hutchinson, 1986; Chenitz & Swanson, 1986) were explored to explain the data. Empowerment, acculturation, role modeling, mentoring, advocacy, catalysis, and role negotiation were considered extensively as possible core variables. However, these concepts were insufficient to explain the scope of the data and the variations in the data. Finally conversion was conceptualized as the process by which the expert nurse advanced the practice of nonexpert nurses to improve patient outcomes. Thenceforth, conversion provided focus and direction to the sorting process. The relationships among the theoretical constructs and their collective relationship to the core variable became the framework for the theory. Sorting organized the piecemeal data into a coherent whole.

The concepts of expert critical care nursing practice and nonexpert critical care nursing practice emerged as having import for the concept of conversion. The Level III constructs were subsumed as properties or subcategories of the three major concepts. While the focus of this study was on the process by which an expert nurse advanced the

practice of nonexpert nurses, the data provided a rich contrast between expert and nonexpert nursing practice. The core variable of conversion emanated from this contrast and can be understood better by understanding the practice differences.

Expert Critical Care Nursing Practice

Expert critical care nursing practice was characterized by the use of a Gestaltic nursing process and independence in practice. An outline of these major characteristics, their categories, and, where appropriate, their subcategories is presented in Figure 4.

Gestaltic nursing process. Gestalt nominally is defined as a unified whole or a pattern having specific properties that cannot be derived from the summation of its component parts (Stein, 1969, p. 594). In this study conceptual clarity was defined as an instance or example of such a unified whole. Conceptual clarity was observed frequently in expert critical care nursing practice. In twenty cases the expert nurse had an accurate understanding of a patient problem upon approaching the bedside. This conceptual clarity was based on visual, auditory, or touch clues without the need for objective data. A specific pattern of immediacy was observed in all cases - the expert nurse knew immediately that the patient had a problem and

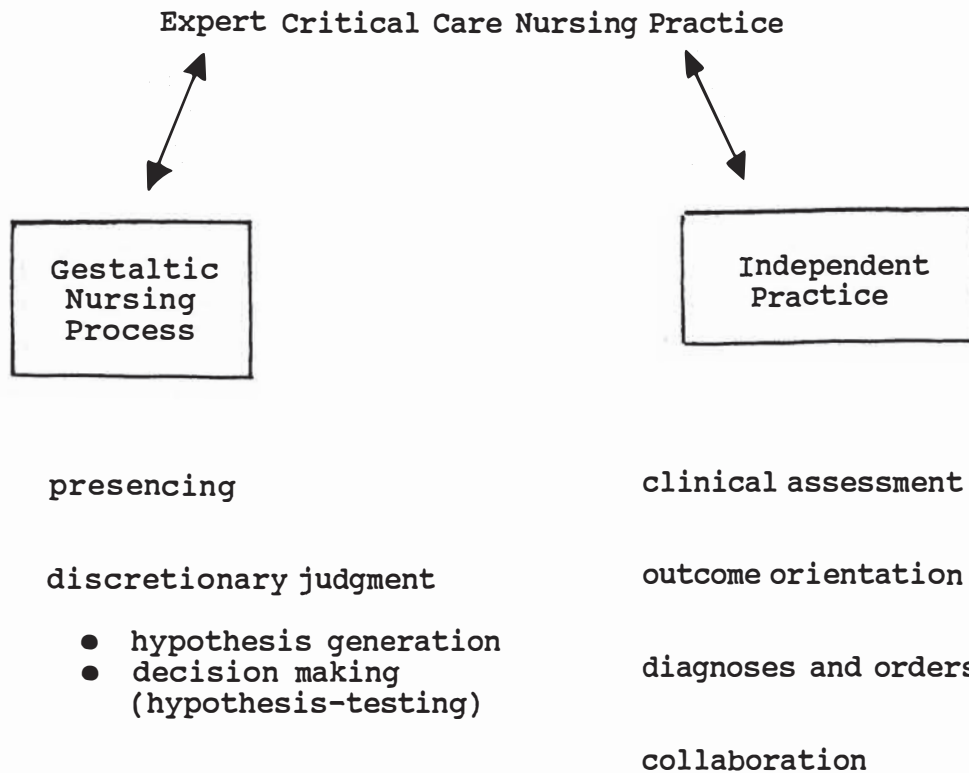


Figure 4. Conceptualization of Expert Critical Care Nursing Practice: Characteristics, Categories, and Subcategories

precisely what the problem was. The consequences of conceptual clarity were rapid interventions in the patient problem, without seeking confirming objective evidence.

Presencing and discretionary judgment were found to be categories of the Gestaltic nursing process used by the expert nurse. Presencing was defined as sensory perception in the absence of explicit objective data. Presencing encompassed the Level II categories of presencing, interpreting, observing, and listening. Table 4 contains examples of presencing, and the corresponding patient outcomes, in expert critical care nursing practice.

Early in the data collection, presencing was most frequently observed in relationship to patient clinical deterioration. In eight cases, the expert nurse had a sense that the patient was going to deteriorate prior to specific objective findings of deterioration. This sense preceded actual deterioration in all cases. No specific pattern to the time frame between the expert nurse's sense and actual patient deterioration was observed. In patients with impending critical deterioration, such as a respiratory or cardiac arrest, the expert "sensed" the impending deterioration as soon as she approached the patient. Deterioration in these cases occurred within one hour of the expert nurse verbalizing concern about the patient's status. In the nine examples of patients who developed progressive

Examples of Presencing in Expert Critical Care NursingPractice and Patient Outcomes

Examples	Patient Outcome
(Presencing clinical deterioration)	
<p>Something is going on with Mrs. B. She's either developing sepsis or some other secondary problem. I don't know what is going on, but her breathing pattern is definitively one of a patient who is tired and does not have the energy to expend on breathing. I ventilated her with a face mask and the positive pressure breathing machine. I told the pulmonary attending and the medical team that we needed to intubate her. After a 15 minute discussion, they decided O.K. we should intubate her. The anesthesiologist came, intubated her, and she had a cardiac arrest a few minutes later (Field Note 16.4).</p>	<p>Patient's ventilation was maintained. Patient was intubated prior to cardiac arrest. The emergency equipment, nurses, and physicians were at the bedside when the patient arrested. The patient had a cardiac arrest within 30 minutes of the expert nurse sensing deterioration. The patient was successfully resuscitated.</p>
(Presencing the development of complications)	
<p>There were three nurses in the nursing lounge. I spoke to Mrs. B.'s nurse and told her that I really felt that Mrs. B. was a candidate for self-extubation and that she needed to be observed very closely. The next day the Head Nurse</p>	<p>Patient extubates herself six hours after the expert nurse warns the staff that she is a candidate for self-extubation.</p>

(table continues)

Presencing in Expert Critical Care Nursing Practice

Examples	Patient Outcomes
<p>informed me that Mrs. B. had extubated herself six hours after I left the unit. When I had left the nursing lounge the other two nurses in the lounge had said, "No, Mrs. B.'s not going to extubate herself. S. [the expert nurse] is worrying about nothing. Mrs. B. has never tried to pull her tube out." The following day, the Head Nurse and the two staff nurses wanted to know how I knew Mrs. B. was going to extubate herself. I couldn't really explain it other than the fact that she was very restless and tachycardic. She seemed to be suffering extreme distress and to no longer be capable of coherence and taking responsibility for her actions (Field Note 7.3).</p> <p>(Presencing clinical improvement)</p> <p>Now that Mrs. S.'s atelectasis was cleared up and her level of consciousness was greatly improved, I saw no reason why she should not wean very easily and be able to be extubated (Field Note 4.1).</p>	<p>Patient was weaned and extubated within 2 hours of expert nurse presencing.</p>

(table continues)

Presencing in Expert Critical Care Nursing Practice

Examples	Patient Outcome
<hr/> <p>(Presencing the needs of the nurse)</p> <p>I saw the float nurse standing in the entrance of the unit. She was still holding her purse and looked frozen to that spot on the floor. I went over to her, welcomed her to the unit, showed her where to put her purse, where to get coffee, pointed out the charge nurse to her, and brought her to her patient assignment. The physician wanted to change out the central line on the patient. I explained to the nurse what that meant, what it was going to entail, and helped her gather all the equipment and supplies. I told the physician that a brand new nurse to the hospital and to the unit would be assisting him so for him to please give her very clear directions and be patient if it took her a while to find anything else that wasn't at the bedside (Field Note 78.8).</p>	
<p>Patient's central line was changed so that he could be transferred to the step-down unit. The float nurse was able to assist with the procedure.</p>	

complications, the expert sensed the impending complication eight hours to three days prior to actual development of the complication. The consequences of expert nurse presencing were early intervention in the patient's deterioration. In most cases, this early intervention consisted of preparing personnel and equipment to respond as the objective signs of deterioration became manifest.

Presencing was also observed in relationship to patient clinical improvement. In seven examples the expert nurse sensed that the patient was going to improve prior to specific objective findings of improvement. As with clinical deterioration, this sense preceded actual improvement in all cases. The time frame between the expert nurse's sense and actual patient improvement varied between one hour and 28 hours. The consequences of expert nurse presencing were aggressive interventions toward patient improvement.

As data collection progressed, presencing was increasingly observed in relationship to the needs of the staff nurses. In fifteen incidents the expert nurse ascertained, by the observation of nonverbal behavior, that a staff nurse was angry, confused, scared, or frustrated. This form of presencing conformed to Pettigrew's (1988) definition of presencing and included the properties of accessibility of the expert nurse to the staff nurse,

attentive listening, a sense of relationship and connectedness, and a sense of being heard and understood. While the expert nurse's recognition of the staff nurse's disturbance occurred immediately upon observation of the non-verbal clues, response to presencing often went unmediated for up to three days. The time frame between recognition and mediation was dependent on the situational context of the environment, the expert nurse, and the staff nurse.

Discretionary judgment was found to be a component of the Gestaltic nursing process. Discretionary judgment was defined as unrestrained understanding and decision. Discretionary judgment encompassed the Level II categories of hypothesis-testing and decision making. Discretionary judgment was observed to contain the subcategories of hypothesis-generation and decision making (hypothesis-testing), with hypothesis-generation being the antecedent and decision making the consequent of discretionary judgment. Table 5 gives examples of discretionary judgment, and the corresponding patient outcomes, in expert critical care nursing practice.

Forty-four clear examples of discretionary judgment in expert nursing practice were interspersed throughout the data collection. In all but two cases, both hypothesis-generation and decision making were observed. The expert

Table 5

Examples of Discretionary Judgment in Expert Critical Care
Nursing Practice and Patient Outcomes

Examples	Patient Outcome
<p>The nurse hung some blood. When I went to the bedside she was examining the blood as it was going through the drip chamber and saying, "What's wrong with this blood?" There were particles floating through it....We stood there together and started trouble-shooting. Checked the filter to make sure it was on appropriately, wondering if this was particulate matter that was not being filtered out. The more I looked at it, it looked like hemolysis. I looked up and the bag that had been attached, instead of saline, was dextrose in water (Field Note 118.7).</p> <p>Mrs. S. was intubated and on the ventilator with a decreased level of consciousness, bronchial breath sounds in the whole left lower lobe, dullness to percussion, and diffuse rhonchi throughout all lung fields. I suspected that her level of consciousness might be caused, in part, by a left lower lobe atelectasis.</p> <p>I worked with Mrs. S. for six hours using various aggressive techniques for</p>	<p>Blood transfusion was turned off until the problem was solved. The transfusion system was changed out. The patient did not receive hemolyzed blood.</p> <p>Atelectasis reversed by expert nurse and patient's level of consciousness improved within three hours of hypothesis generation.</p>

(table continues)

Discretionary Judgment in Expert Critical Care Nursing Practice

Examples	Patient Outcomes
resolving atelectasis. By the third hour of therapy her level of consciousness was much lighter and she was responding appropriately to conversation (Field Note 1.2).	

nurse generated specific or general hypotheses regarding patient problems and diagnoses. Hypothesis generation and specificity occurred within seconds to minutes of patient evaluation. The cues were objective data in 14 (32%) of the examples of discretionary judgment, subjective data in 15 (34%) of the examples, and a combination of subjective and objective data in 15 (34%) of the examples.

When the cues were subjective data only, the expert nurse searched for confirming evidence to support or reject the specific hypothesis under consideration. This was not the case with objective cues or combination cues. Regardless of cue types, the hypotheses were tested with independent and/or interdependent interventions. Hypothesis-testing was observed even when the search for confirming evidence with subjective cues only failed to produce the sought objective evidence. The expert nurse remained with the patient, either providing or supervising direct care, until the hypothesis had been tested. In the majority of cases, the hypothesis was considered tested within a four hour period. In all cases, the hypothesis was supported.

The field notes reflect that the expert nurse brooded over both the hypothesis and the decision making regarding intervention until the hypothesis had been supported. This agitation took the form of a mental rumination with the expert reviewing the cues, the rationale for the decision

making, the hypothesis evaluation criteria, and the amount of time she was willing to allot to the intervention trial.

There were instances when the expert generated a specific hypothesis but left the decision making or the implementation of the decision to others. In the events when the delegate did not follow through on hypothesis-testing, the expert nurse was filled with self-admonishment for having abdicated responsibility. Interestingly, the event did not prevent the expert nurse from subsequent delegations, even to the very person who failed to follow through. The expert followed up with the individual, inquiring as to why the decision had not been implemented, discussing the ramifications of failing to implement the intervention, and envisioning aloud the probable outcome for the patient had the hypothesis been tested. The expert nurse accepted the responsibility for failure to test the hypothesis and did not project the responsibility onto the delegate. However, in subsequent delegations, the expert nurse spent additional time assessing the ability and intent of the delegate to assume the decision making or the implementation.

Presencing was previously defined as a sensory perception in the absence of explicit objective data. In two instances, the expert did not follow through on presencing with discretionary judgment. She predicted

patient deterioration from subjective data, activated a general hypothesis, and searched for confirming evidence, but did not follow through with hypothesis-testing. The self-admonishment is illustrated in the following excerpt from the field notes.

I really feel that I missed the boat on Saturday by not working more closely with the nursing staff, respiratory therapists, and the housestaff. I should have outlined a rigid plan for pulmonary toilet with this woman, or gone to the unit and paid attention to her earlier today. Maybe if we intubated her sooner she would be in better shape. I probably should have picked her up as a case load patient and followed her very closely until what was considered a reasonable nursing goal was attained - that of getting her over her immediate problems, out of the unit, on the floor where she could be mobilized, and home for the duration of her life span with her family. I really think that with aggressive and constant care that goal could have been achieved (FN 16.8).

Independent practice. Independent practice

characterized expert critical care nursing practice. This characteristic does not imply that expert practice consisted only of independent functions and actions; the practice was characterized by dependent and interdependent functions as well. However, an unmistakable theme of independent practice emerged from the data. Clinical assessment, outcome orientation, diagnoses and orders, and collaboration emerged as categories of independent practice of the expert critical care nurse. Each of these categories is discussed.

Clinical assessment was pervasive; it was featured in nearly every field note incident. This category encompassed the Level II categories of assessing, identifying problems, and problem-solving. Table 6 provides examples of clinical assessment, and the resulting patient outcomes, in expert critical care nursing practice.

The data contained 161 (17%) examples of expert nurse clinical assessment. The physical assessment skills of inspection, palpation, percussion, and auscultation were very well developed in the expert nurse's practice. At a glance, the expert nurse saw interrelated patterns so that the patient problem was immediately obvious, relevant, and solvable.

The expert nurse used a diverse array of input for clinical assessment. Diagnostic tests, patient responses to technology, patient verbal and non-verbal reports, and family input, in addition to the physical assessment skills, were all considered in the assessment process. The expert made common use of chest X-rays, blood gases, and hemodynamic measurements in clinical assessment. However, these parameters supplemented patient physical assessment; they did not substitute for physical assessment. A marked difference between the expert and nonexpert nurse was the dependence on laboratory tests. The expert trusted her

Table 6

Examples of Clinical Assessment in Expert Critical Care
Nursing Practice and Patient Outcomes

Examples	Patient Outcomes
Across the unit a woman was intubated, extremely agitated, diaphoretic, and her heart rate was in the high 180s. As I approached the bedside I could hear vocalizing around her endotracheal tube (Field Note 6.0).	The expert nurse inserted the endotracheal tube through the patient's larynx. The woman became calm, had equal anterior breath sounds, the ventilator pressures came down, and her heart rate fell to the 110 to 120 range. Two chest X-rays were avoided.
Mr. S. has respiratory distress syndrome, is intubated and on the ventilator with 70% oxygen and 10 centimeters of positive end-expiratory pressure (PEEP). I noticed that he was being suctioned with an ambu bag that had a 36 inch reservoir tube on the end and a PEEP valve. The ambu bag was not delivering 70% oxygen, let alone the 100% oxygen he needed during suctioning (Field Note 2.1)	The reservoir tube was extended to 10 feet to deliver 98% oxygen. Mr. S. stopped having potentially lethal dysrhythmias during the suctioning procedure.
They wanted to wean Mrs. S. from the ventilator by gradually reducing her respiratory rate on synchronized intermittent mandatory ventilation (SIMV) and checking her arterial blood gas every	Mrs. S. was extubated after only one arterial blood gas. She did very well, without further complication.

(table continues)

Clinical Assessment in Expert Critical Care Nursing Practice

Examples	Patient Outcomes
<p>hour. Now that Mrs. S.'s atelectasis was cleared up and her level of consciousness was greatly improved, I saw no reason why she should not wean very easily. I got a set of ventilatory parameters and put Mrs. S. on the T-piece for one hour. I stayed with her monitoring her level of consciousness, subjective responses, and vital signs. At the end of the hour, I repeated her ventilatory parameters. They were excellent (Field Note 4.3).</p>	

physical assessment skills even when the findings were not supported by laboratory tests. The expert's confidence and comfort with physical assessment skills obviated the need for diagnostic and monitoring tests in many instances.

Clinical assessment in expert critical care nursing practice was practiced within the context of vigilance. An example of vigilance was the understanding that all intubated patients are at risk for multiple complications, one being a leak in the endotracheal tube cuff. The field notes were replete with examples of the expert nurse's detection of cuff leaks which went undetected by nurses, physicians, and respiratory therapists. The expert nurse was observed to practice clinical assessment with anticipation of patient responses to medical and nursing interventions. For instance, a patient undergoing a central line insertion was anticipated to have a pneumothorax. During and after line insertion, the expert nurse searched for signs and symptoms of a pneumothorax.

The consequences of expert nurse clinical assessment included a reduced need for technologic monitoring and diagnostic tests, early therapeutic interventions, aggressive medical and nursing interventions, prevention of patient complications, and validation and alleviation of subjective patient complaints.

Outcome orientation was found to be a category of independent practice. This category included the Level II categories of evaluating, following up, and planning. Outcome orientation was defined as the orientation of expert critical care nursing practice toward patient outcomes. The data contained 69 (7%) examples of outcome orientation in expert practice. Table 7 presents examples of this category and the effects on patients.

There was evidence of an expert nurse mentality that can be expressed in such cliches as "seize the opportunity" and "window of opportunity." The expert took, and encouraged others to take, the present opportunity to move the patient toward the desired therapeutic goal. For example, if a patient showed physical and emotional readiness to be weaned from the ventilator, the expert nurse wanted the weaning process instituted right then. She exhibited poor tolerance for failure to seize the opportunity due to "inadequate staffing," "the respiratory therapist is unavailable," "we don't have the necessary equipment," "we don't have an order," "weaning is done during the day shift," and other reasons proffered by nonexpert nurses.

The expert nurse repeatedly emphasized the need for short- and long-term goals for each patient and constant progress toward those goals. Expert nursing practice

Table 7

Examples of Outcome Orientation in Expert Critical Care
Nursing Practice and Patient Outcomes

Examples	Patient Outcomes
I worked with Mrs. S. for six hours using frequent positioning, suctioning, and hyperinflation to mobilize secretions and reexpand the alveoli. By the third hour of therapy her level of consciousness was much lighter and she was responding appropriately to conversation. By the end of five to six hours she no longer had bronchial breath sounds in the left lower lobe (Field Note 1.2)	Patient's atelectasis was totally reversed and her level of consciousness was improved.
His endotracheal tube was not properly secured so the staff nurse and I resecured it together. We did have to secure the tube twice. The first time the way she looped the tape around the tube and pulled the tape around Mr. H.'s neck weren't much of an improvement over the way the tube was secured initially (Field Note 33.3).	Patient's endotracheal tube was resecured until it was done right. Patient had a stable and secure airway.
Mrs. B.'s post code chest X-ray showed the tip of the endotracheal tube in the right main stem bronchus. I asked the staff nurse if the tube had been pulled	Endotracheal tube was repositioned to reduce the risk of pneumothorax in a woman with respiratory failure. The woman did not develop a pneumothorax. (table continues)

Outcome Orientation in Expert Critical Care Nursing Practice

Examples	Patient Outcomes
<hr/> <p>back and she said, "No." I assessed Mrs. B. and she had decreased breath sounds in the left upper lobe and her peak inspiratory pressure on the ventilator was 20 centimeters higher than it had been. I said, "I'm going to pull the tube back." She said, "Do you have the authority to do that?" I responded, "I'm taking the authority. Mrs. B. is at high risk for a pneumothorax with a main stem intubation. She, of all people, can't afford a pneumothorax" (Field Note 17.3).</p> <hr/>	

reflected a nursing care process oriented toward individualized patient goal attainment.

The expert nurse was observed to exceed the conventional boundaries of the nursing domain. This most often happened when the patient would have been at high risk if the intervention had been delayed. For instance, when a patient was exhibiting severe respiratory distress from an esophageal intubation, the expert nurse reintubated the patient rather than call the physician. The risk of the patient sustaining cardiopulmonary arrest was deemed greater than the benefit of awaiting physician arrival.

The expert exceeded conventional nursing boundaries in nonemergency situations as well. In one example, the physician was reducing the ventilator oxygen level gradually and ordering a blood gas test after each change in oxygen concentration. The time constraints of getting the test results and contacting the physician for a new oxygen level order resulted in trivial progress toward the goal of extubating the patient. After clinical assessment, the expert nurse reduced the oxygen concentration to almost room air and sent a blood gas. The patient was extubated within the hour and transferred out of the MCCU.

The expert nurse spent an inordinate amount of time working with the nursing staff, medical housestaff, and respiratory therapists to establish therapeutic end-points.

Therapies were initiated and sustained for days without articulation and evaluation of the desired patient outcome from the therapy. The subject of therapeutic end-points is discussed further under developing expertise but it validates the consistent orientation of the expert nurse toward patient outcomes.

The prime motive for the outcome orientation in expert nursing practice was hypothesized to be patient advocacy. The data showed that the expert nurse established a covenant with many patients. In the example in Table 7 of the patient with atelectasis and decreased level of consciousness, the expert nurse talked to the comatose patient - giving her information about her status, acknowledging how much the patient must want to see her new infant, conveying nursery reports on how the baby was doing, sharing the expert's desire to see her reunited with her infant, outlining the expert's working hypothesis and plan to test it. As the patient's level of consciousness improved, the expert nurse coached her along, telling the patient how she was improving and giving rough time estimates on when the patient and her infant might be reunited.

Patient advocacy was observed in many expert nurse/patient encounters, even when death was the expected outcome. For example, the expert helped admit an old woman

riddled with cancer to the MCCU from a nursing home for acute hemodialysis. The woman was obtunded but muttered something over and over. The expert bent down and heard the woman say "I don't want to die alone." The expert promised the patient that she would not die alone. The woman stopped muttering and went into a coma, from which she never awakened. The expert sat on the bed and held the woman's hand for several hours until she died.

The consequences of outcome orientation in expert critical care nursing practice included the avoidance of invasive procedures, decreased length of MCCU stay, early interventions, aggressive nursing and medical interventions, rational end-points for therapies, and patient/nurse covenants. These consequences were not measured systematically nor did they occur for every patient. However, the data provided ample evidence of the difference outcome orientation made for the patients discussed in the field notes.

Diagnoses and orders were found to be a category in the independent practice of the expert critical care nurse. Diagnoses and orders encompassed the Level II categories of diagnosing, ordering/ directing, and systems problems. The fifty-six cases of diagnosis and order actions in the data included those of a medical nature as well as nursing. Table 8 presents examples of diagnosing and ordering in

Table 8

Examples of Diagnoses and Orders in Expert Critical Care
Nursing Practice and Patient Outcomes

Examples	Patient Outcomes
<p>Mrs. M. had bronchial breath sounds in two specific spots; in the left lower lobe posteriorly and the right middle lobe. I asked the physician about the bronchial breath sounds indicating aspiration pneumonia. Dr. B. said he couldn't hear any bronchial breath sounds. They all sounded the same to him and he thought her lungs were essentially clear. So I circled the areas because they were distinctly text-book bronchial breath sounds. I circled the two areas in the left lower lobe and the area in the right middle lobe and asked him to come back and listen again. He still couldn't hear any differentiation between the breath sounds nor could the resident who listened (Field Note 12.8)</p> <p>It was quite possible that a pneumothorax had been incurred during the Swan Ganz attempts. So I told the physician who was putting the arterial line in that if the peak inspiratory pressure went up any higher that he</p>	<p>The physician dismissed the diagnosis of aspiration pneumonia until the following day when the radiology report came back with the right middle lobe and left lower lobe aspiration pneumonia. Mrs. M. developed adult respiratory distress syndrome from her fulminant gram negative pneumonia and was considered a candidate for extracorporeal membrane oxygenation.</p> <p>The patient did not develop a pneumothorax.</p>

(table continues)

Diagnoses and Orders in Expert Critical Care Practice

Examples	Patient Outcomes
<p>should stop the Swan insertion and explore pneumothorax. I told the nurse and the physician to keep their eyes on the cardiac monitor. If the bradycardia progressed, they had to abort the procedure and rule out right pneumothorax (Field Note 85.9)</p>	<p>The expert nurse organized the lines, calibrated the equipment, and took new parameters. They were all normal. The physicians agreed that Mrs. B. did not have pericardial tamponade. Instead of being tapped, she was weaned off of her multiple vasoactive drug infusions.</p>
<p>I walked into the room and there was Mrs. B., a 51 year old lady who had arrested the previous day. The working diagnoses were multisystem failure with end-stage renal disease and pericardial tamponade. The physicians were setting up to tap her, thinking she had another pericardial tamponade. Mrs. B. was alert, responsive, warm peripherally, and looked just fine. I said, "Mrs. B. doesn't have pericardial tamponade. Let us get the lines untangled, properly calibrated, and organized before you make any major therapeutic decisions" (Field Note 104.10).</p>	

expert critical care nursing practice and the corresponding patient outcomes.

The field notes indicated that the expert nurse made both medical and nursing diagnoses predominantly within her area of expertise - that of pulmonary disorders and complications. Physician response to medical diagnosis by the expert nurse was variable; it was dependent on the conviction with which the expert communicated the diagnosis, the objective data available to support the diagnosis, and the physician's clinical assessment ability. The physician readily accepted the expert's diagnosis when the expert had confidence in it. If the expert made a tentative diagnosis with little or no substantiating objective data, the physician either considered the diagnosis as a possibility or dismissed it altogether. Consideration versus dismissal was dependent on the physician's clinical assessment skills, as demonstrated in the first example of Table 8. Nurse response to medical or nursing diagnoses by the expert nurse was likewise variable and dependent on the expert's conviction and supporting objective data. The nurses' clinical assessment skills were not found to be a variable in nurse response to the expert's diagnoses.

The expert nurse made both medical and nursing diagnoses, within and outside of her expertise, by default. In other words, if no diagnosis had been made or an

erroneous diagnosis had been made, the expert nurse was observed to provide a correct diagnosis. An example of this is shown in the third example of Table 8. The physician diagnosis was based on the patient's past medical history and invalid objective data. The expert nurse refuted the diagnosis based on her clinical assessment of the patient. If a correct diagnosis had been made and if other expertise was available, the expert nurse's input into diagnoses and orders took the form of collaboration or inquiry.

The bulk of this category consisted of ordering and directing both diagnostic and monitoring tests and interventions. Ordering and directing occurred both directly and indirectly. The nature of orders by the expert nurse was dependent on the situational context, and was governed by availability of other expertise and patient responses. The expert nurse frequently provided orders and direction for respiratory care, cardiopulmonary monitoring, ventilator parameters, weaning from mechanical ventilation, drug titration, diagnostic tests, and nursing care. These orders and directions were readily accepted, in most instances, by nurses, respiratory therapists, and physicians. One challenge to an order given by the expert nurse was noted. A physician intern objected to the expert nurse ordering a reduction in oxygen concentration on a ventilated patient.

He felt strongly that the action belonged within the physician domain.

Indirect ordering and directing also occurred frequently in expert critical care nursing practice. The physician would ask the expert what she thought should be done and then proceed to write the expert's suggestion as an order. The expert nurse frequently was observed to prime the nursing staff with data and ask them to suggest a particular therapy to the physician. The expert nurse was observed to direct physician interventions, particularly in regard to articulating and treating toward therapeutic endpoints and with patient clinical deterioration. In an illustrative case, the expert nurse directed physician intervention to perform a thoracentesis. This occurred early in the research when the expert nurse was establishing credibility. Discomfort with crossing the boundary from nursing domain to physician domain is evident in the following excerpt.

It was really an uncomfortable feeling for me. I simply made the comment to the medical student that I didn't think she [the patient] could breathe like that much longer and before I knew it everyone from the attending on down was standing at the bedside asking me what to do. My feeling was, "Hey you folks don't know who I am or where I came from and all of a sudden I'm standing here and you're asking me to tell you how to treat this woman. (Field Note 9.10)

Such discomfort abated as the data collection progressed, but the expert nurse was more comfortable providing direction within the nursing domain of interventions.

The consequences of expert nurse diagnoses and orders were more efficient delivery of patient care due to early and aggressive interventions, prevention and early detection of patient complications, and care tailored to the individual patient's responses. As the data collection progressed, the expert nurse was observed to play a lesser role in this area and the nursing staff was observed to play a greater role.

Collaboration emerged as the fourth category of the independent practice in expert critical care nursing practice. Collaboration was defined as sharing responsibility for patient outcomes. The data contained 76 (8%) examples of collaboration. The Level II categories of assertiveness, conflict resolution, consultation, and helping were included in this category. Table 9 presents examples of collaboration in expert critical care nursing practice and the associated patient outcomes.

Collaboration in expert critical care nursing practice occurred among the expert nurse and nonexpert nurses, respiratory therapists, and physicians. The degree of collaboration was variable. In other words, sharing was noted to be inequitable. The first example in Table 9

Table 9

Examples of Collaboration in Expert Critical Care Nursing
Practice and Patient Outcomes

Examples	Patient Outcomes
<p>...I ended up talking to the patient's attending and together we established a weaning protocol which was to consist of T-tube as tolerated once a shift and then back on the ventilator at the current settings when the patient's respiratory rate went up into the 30s. I communicated the plan to the respiratory therapist in the unit and to the nurse taking care of the patient. (Field Note 4.5)</p>	<p>Expert nurse and the attending devise a weaning protocol together. Expert communicates plan to staff and therapist. However, the plan is not followed (see second example) and the patient does not get weaned. Patient stays on the ventilator for a longer period of time than needed.</p>
<p>Went in to check on Mrs. P. and found out that she had not been weaned on the T-piece since I left yesterday. I asked the nurse and the therapist why she hadn't been weaned and was told there was no order for weaning. This was my problem since I was the one who helped devise the protocol with the attending. I was not aware that a verbal order needed to be on the doctor's order sheet to have the plan followed through. I asked the nurse just exactly what I needed to write to get the weaning program in gear.</p>	<p>Expert follows the rules of needing a written order and weaning protocol is finally initiated. Patient does well with weaning.</p>

(table continues)

Collaboration in Expert Critical Care Nursing Practice

Examples	Patient Outcomes
<p>She told me and I wrote it on the order sheet.</p> <p>I also wrote in the progress notes, that due to my failure to communicate the weaning plan as an order, Mrs. P. had not been weaned since 10:00 yesterday morning, that the order was now written, the communications were understood by the total staff, and weaning was progressing. The nurse asked me why I wrote that in the chart. I told her it was because we had not weaned Mrs. P. and the housestaff and attending were under the impression that she was being weaned as evidenced by the progress notes for the last 28 hours that referred to weaning making progress, patient doing well with weaning, etc. We could not let the medical team think she was being weaned, when in fact she hadn't been. Since I was the one who goofed by not writing the order, I should take full responsibility for it (Field Note 8.6).</p>	<p>Patient is successfully extubated.</p>
<p>Later that evening the attending physician asked my opinion on when the patient could be extubated. She had been on the T-piece for two hours early in the evening and tolerated the period well, keeping her respiratory rate in the</p>	(table continues)

Collaboration in Expert Critical Care Nursing Practice

Examples	Patient Outcomes
<p>low twenties and showed no subjective or objective problems with the weaning. So I told the physician that I thought the patient could be extubated and she was extubated (Field Note 8.8).</p>	

demonstrated true collaboration between the expert nurse and the physician but only communication between the expert nurse, nonexpert nurse, and respiratory therapist.

Communication, without sharing responsibility, resulted in initial failure of the collaborative efforts. In subsequent collaborative efforts, the plan for the patient was established with the nurses, and respiratory therapist if appropriate, as participants in the plan development. Thus, participation in establishing patient outcome goals was seen to be a condition for collaboration.

Accountability was observed in all the examples of collaboration in expert nursing practice. The expert nurse was observed to take credit, wholly or partly, for the result of collaboration. In successful results of collaboration, the expert took partial credit for the patient's outcome. The expert was observed to verbalize or document credit to the "team effort." In unsuccessful results of collaboration, the expert generally was observed to take total credit for the failure, as illustrated in the second example of Table 9.

All examples of expert nurse collaboration in the data had patient outcome as the focus. Whether the collaboration concerned a specific intervention or long-term goal, patient outcome was observed to be the pivotal focus of discussion.

Nonexpert Critical Care Nursing Practice

Nonexpert critical care nursing practice was found to be characterized by a dissociated nursing process and dependence. An outline of these major characteristics, their categories, and, where appropriate, their subcategories is presented in Figure 5.

Dissociated nursing process. Dissociate is defined nominally as to disunite or separate (Stein, 1969, p. 416). The nursing process used in nonexpert critical care nursing practice consisted of the distinct steps of assessment, planning, intervention, and evaluation. These steps, however, were observed to be dissociated from each other.

Assessment occurred primarily at change of shift and vital signs were taken as ordered by the physician or per unit policy. Assessment lacked specificity or relationship to the patient problem; it was general and similar for every patient. Respiratory assessment, for example, consisted of auscultating the anterior upper lobes during the initial assessment following change of shift. The remaining lung fields, the patient response to ventilatory support, blood gas results, and breathing pattern were not evaluated. Even in intubated patients, chest auscultation was not done beyond the initial assessment. Assessment was not observed in relationship to interventions. For example, a change in

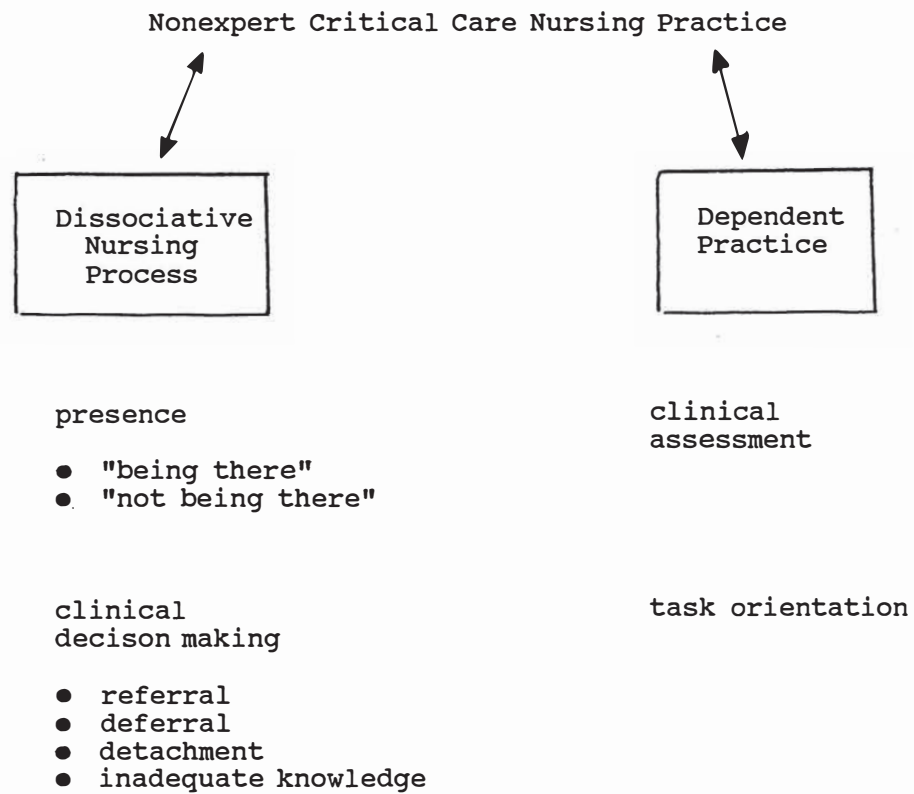


Figure 5. Conceptualization of Nonexpert Critical Care Nursing Practice: Characteristics, Categories, and Subcategories

vasoactive drug therapy was neither preceded nor followed by cardiovascular assessment.

Planning was limited to planning the nurse's tasks for the shift, such as hygiene, vital signs, medications, and treatments. The nonexpert nurse did not evidence planning in relation to recovery of the patient. Tasks were performed toward patient recovery but these were the result of a physician order (e.g., get patient up in chair two times a day). Interventions were not observed to be initiated by the nonexpert nurse. The nonexpert nurse performed interventions according to physician order and unit policy. Furthermore, the nonexpert nurse did not articulate the relationship between the intervention and patient outcome. Ambulation, for instance, was articulated as a physician order, not as a specific nursing intervention to prevent complications and to move the patient toward the desired goal.

Evaluation was performed in relationship to tasks and consisted of noting that a task had been performed, such as "bed bath given," "ultrasonic nebulizer treatment given by respiratory therapist," "thoracentesis performed by Dr. X." Documentation or articulation of evaluation of patient response to an intervention was not observed in nonexpert critical care nursing practice.

Presence and clinical decision making were found to be categories of the dissociative nursing process used by the nonexpert nurse. Presence was defined as "being there" (Heidegger, 1949, 1982) or "not being there" in the physical or spiritual sense. A pattern to presence was observed; there was variability of presence among nonexpert nurses and consistency of presence with each nurse. Table 10 gives examples of presence in nonexpert critical care nursing and the associated patient outcomes.

Some nurses exhibited presence with the patient. This was unrelated to years of experience in critical care nursing or other demographic variables. These nurses used eye contact and touch when communicating with the patient. They talked to the patient frequently, explained what they were doing to the patient, and called the patient by name. These nurses frequently requested assignment to the same patient day after day.

"Not being there" was defined as being away from the patient in the physical or spiritual sense. The data documented an alarming number of times when the patient deteriorated and no nurse responded to the patient.

Clinical decision making emerged as a category in the dissociative nursing process of nonexpert critical care nursing practice. Clinical decision making was observed to be characterized by referral, deferral, detachment, and

Table 10

Examples of Presence in Nonexpert Critical Care NursingPractice and Patient Outcomes

Examples	Patient Outcome
(being there)	
This nurse has been caring for L., a patient with Guillian Barre Syndrome, for days now. The nurse does an excellent job lip reading and is teaching L.'s family how to lip read. K. [the nurse] and L. seem to communicate with their eyes. K. is always looking at L. to see if she needs something (Field Note 21).	The patient's family visited more frequently when they could communicate with L. When L. recovered, she came back to the unit to visit and specifically asked for K., saying how safe she remembered feeling when K. was taking care of her.
(not being there)	
The nurse was at the bedside bathing Mr. S. while the respiratory therapist was suctioning him. During suctioning, Mr. S. had multifocal premature ventricular contractions. Neither the nurse nor the therapist looked at the cardiac monitor during suctioning (Field Note 2.1).	The patient had dangerous dysrhythmias during the suctioning procedure.
Mr. S. was quite agitated and kept pointing to his endotracheal tube. The nurse was at the central station with her back to	The patient was inspiring air five degrees centigrade above normal. Whether he breathed the hot gas long enough to sustain thermal

(table continues)

Presence in Nonexpert Critical Care Nursing Practice

Examples	Patient Outcomes
<p>the patient. The in-line thermometer on the ventilator was measuring 42 degrees centigrade six inches distal to his airway (Field Note 2.5).</p>	<p>injury of his airway is unknown. No autopsy was performed at death.</p>
<p>I heard a conversation in the nursing lounge about Mrs. B. The nurses were discussing how anxious Mrs. B. was about her lymphoma diagnosis. The nurse taking care of Mrs. B. had told her, "Well, everyone dies sooner or later." The nurses in the lounge said that this was really an appropriate response and how well the nurse had handled Mrs. B.'s anxiety about death and dying (Field Note 18.3).</p>	<p>The patient continued to be anxious, restless, and agitated throughout her critical care unit stay. She extubated herself twice.</p>

inadequate knowledge. Table 11 provides examples of clinical decision making in nonexpert critical care nursing practice.

Decisions about aspects of care traditionally considered to be within the nursing domain were referred to the physician, as shown in the first example of Table 11. Decisions regarding nutrition, hygiene, and activity were also referred to the physician. Clinical decisions were made within the context of deferral as well. In other words, individual decisions were deferred to standard unit policies and procedures. Intubated patients were restrained by unit policy regardless of the patient's level of alertness and ability to participate in self-care. If a family member requested visiting privileges outside of the usual times, the nurse deferred to the unit policy for visiting hours. There was no consideration given to the request.

Detachment emerged as a theme in nonexpert clinical decision making. Non-verbal behaviors conformed to verbal decisions and had a sense of objectivity. When such decisions were challenged by the expert nurse, the response was "We have rules around here. It's unit policy." Frequently the nonexpert nurse was observed to have inadequate knowledge to implement a decision. In 34 such

Table 11

Examples of Clinical Decision Making in Nonexpert Critical
Care Nursing Practice and Patient Outcomes

Examples	Patient Outcomes
<p>Dr. D. asked about Mr. M.'s bowel habits. The nurse taking care of Mr. M. didn't know. She checked the chart, talked to the Assistant Head Nurse, and said, "It looks like he hasn't moved his bowels since admission four days ago." The physician inquired why the nurses had not done something about this. The nurse said, "What do you want me to do?" Dr. D. told her to check for a fecal impaction, and if one was present to give Mr. M. a Fleets enema.</p>	<p>The patient had a fecal impaction.</p>
<p>The physician told the nurse to wean Mrs. R. off the nitroprusside... The nurse was telling me that she had just turned the drip off. I asked her how much drug Mrs. R. had been receiving per minute. The nurse said, "She's been getting 10 ccs. per hour." I said, "How much drug per minute?" The nurse said she had no idea. The drips are made up in ccs per hour and they are ordered in ccs per hour. So I said, "We need to calculate how much Mrs. R. was getting per minute because if she is on a high dose of nitroprusside</p>	<p>The patient's nitroprusside drip was turned back on and a plan was made for incremental decreases in the drug followed by clinical assessment and hemodynamic parameter measurements.</p>

(table continues)

Examples	Patient Outcomes
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we can't just cut it off without tapering the drug. We can't make any decision about weaning until we know how much drug she's been receiving."

The act of calculation was one that the nurse was not inclined to do voluntarily. She had to be coached into the necessity for knowing this piece of information. She asked if I would do it for her. I said, "I will do it to check you but you need to work it through yourself." Her response was "I don't know how to do it." I said, "Think it through. If we have 100 milligrams of drug in 250 ccs of solution, how many milligrams of drug are in each cc?" Blank expression on the nurse's face. I said, "Work it through. Just start with step one." So she worked that out. "O.K., if we have that much per cc and the drip is 10 ccs per hour, how many milligrams per hour is the patient getting?" So then she worked through that step. I said, "Good. That's milligrams per hour. Now, how many milligrams per minute is the patient getting?" and she was able to work that out (Field Note 89.0).

cases the nurse ignored the knowledge deficit and proceeded anyway. The second example in Table 11 illustrated clinical decision making with inadequate knowledge.

Dependent practice. Dependent practice characterized nonexpert critical care nursing practice. Interdependent functions also were observed, but, in stark contrast to expert practice, independent practice was not observed. Clinical assessment and task orientation emerged as the categories of dependent practice.

Clinical assessment in nonexpert critical care nursing practice was observed to be variable and ranged from unacceptable to competent. Unacceptable clinical assessment consisted of taking vital signs and diagnostic/monitoring parameters as ordered. Clinical parameters were otherwise ignored. Performance of clinical assessment was task-oriented and divorced from rationale and interrelationships. Table 12 provides examples of clinical assessment, and the corresponding patient outcomes, in nonexpert critical care nursing practice.

Competent clinical assessment was observed in those nurses who used presence in their care of patients. Since these nurses knew their patients and spent more time at the bedside, they noted changes in the patient's condition. They responded to observable changes in waveforms and the patient's appearance or behavior. Responses were

Table 12

Examples of Clinical Assessment in Nonexpert Critical Care
Nursing Practice and Patient Outcomes

Examples	Patient Outcomes
<p>Mrs. T. is receiving nitroprusside and Dobutamine by continuous drip. The medical team taking care of her is considering adding Nitroglycerin and Dopamine continuous infusions. When the cardiology, internal medicine, and pulmonary teams made their rounds, there were no hemodynamic parameters recorded between 6:00 AM and 4:00 PM. When the nurses were questioned about this by the expert nurse, they stated that the cardiac output, systemic vascular resistance, cardiac index and other hemodynamic parameters were ordered at 4:00 PM when the nitroprusside was adjusted to 40 drops per minute.</p> <p>When the expert nurse discussed the value of having a trend of all the hemodynamic parameters for making rational decisions about adjusting the existing continuous infusions and adding new continuous infusions, the nurses stated that nobody paid attention to the parameters anyway and they really didn't have time to do them just for their own sakes (Field Note 32.4).</p>	<p>The patient received vasoactive drugs by continuous intravenous infusion without the effects of the drugs being evaluated hemodynamically. Of note is that the patient had central venous, Swan Ganz, and arterial lines, with their attendant iatrogenic risks, for the purpose of monitoring drug therapy.</p>

(table continues)

Clinical Assessment in Nonexpert Nursing Practice

Examples	Patient Outcomes
<p>Mrs. D.'s high pressure ventilator alarm was going off continuously and she was banging the side rails with her restrained hands. The nurse & two medical residents were at the bedside, looking at her monitor. The high pressure alarm kept going off and Mrs. D. kept banging the side rails so I went over to see what was going on. Mrs. D. was dusky, her arterial line waveform was dropping, her cardiac waveform was showing dangerous dysrhythmias, and I could hear her high-pitched crowing half-way to the bedside. I grabbed the resuscitation cart. The nurse and the residents had been trying to interpret the pulmonary artery waveform and didn't hear Mrs. D. or see the changes in the arterial waveform and cardiac pattern. Only when I mobilized the resuscitation effort did they realize the criticalness of Mrs. D.'s situation.</p>	<p>Objective and subjective signs of the patient's deterioration were not recognized by the nurse and residents. The patient had a cardiopulmonary arrest precipitated by severe bronchospasms.</p>

situationally dependent and often included eliciting information from the patient, doing specific physical assessment, and calling the expert nurse, physician, or respiratory therapist for assistance. Nurse response was based largely on objective cues; response to subjective cues was not observed early in the data collection phase.

Although these nurses did clinical assessment when patient response warranted it, their assessment skills were not well developed. Auscultatory chest findings, for example, were differentiated into "clear" or gradations of "noisy" or "wet." When clinical assessment was performed, it clearly required the nurse's total concentration. This was evidenced in the second example of Table 12 by the nurse's total concentration on the pulmonary artery waveform, to the exclusion of being aware of surrounding events. Neither the nurse nor the physicians were aware of the ventilator alarm or the patient banging on the side rails right next to them.

Nonexpert nurses gave high significance to diagnostic test and technologic monitoring data in their clinical assessment. They did not confirm technologically-derived data with physical assessment of the patient. Examples abounded of the patient showing both objective and subjective cues of deterioration. Nonexpert recognition of deterioration, however, awaited significant changes in

cardiac rhythm, arterial pressure waveform, blood gas results, or other technologically-derived data.

Neither vigilance nor anticipation were observed in nonexpert clinical assessment. Even when the nurse could verbalize formal knowledge, such as a potential complication of central line insertion is pneumothorax, nonexpert nurses did not assess the patient for pneumothorax during or following line insertion. They awaited the radiology report from the post-line insertion chest film.

Task orientation emerged as a category of dependent practice. Task orientation was defined as the orientation toward tasks. Table 13 provides examples of task orientation in nonexpert critical care nursing and the associated patient outcomes.

The data demonstrated that the nonexpert nurse was not oriented toward patient outcomes. Therapies were initiated and sustained for long periods of time without articulation and evaluation of the desired patient outcome from the therapy. Since no therapeutic goal had been formulated for the patient, there was no systematic progress toward the desired goal.

The care and therapy of MCCU patients was observed to be divided into distinctive domains. The nurses performed their tasks related to patient hygiene, physician order, and unit policy; the respiratory therapists performed their

Table 13

Examples of Task Orientation in Nonexpert Critical Care
Nursing Practice and Patient Outcomes

Examples	Patient Outcomes
<p>Mr. S., a young man with AIDS in isolation was intubated for his deteriorating pneumocystis pneumonia. After the intubation, the nurse, the respiratory therapist, and the anesthesiologist left the isolation room. A few minutes later, the therapist noticed that Mr. S.'s low pressure ventilator alarm kept cycling. The therapist couldn't find anything wrong with the alarm so he called the nurse who told the Head Nurse who called the expert nurse. There was an obvious leak in the endotracheal tube cuff. The nurse said, "There can't be. I checked the cuff 10 minutes ago before he was intubated." (Field Note 10.2).</p>	<p>There was an obvious leak in the patient's endotracheal tube cuff. The leak resulted in inadequate ventilation and hypoxemia for 10 minutes. The patient had to be reintubated with a new tube.</p>
<p>I asked the nurse what was wrong with Mr. H., a new patient in the unit. She said, "I don't know. He needs antibiotics, chest physiotherapy, and frequent suctioning." (Field Note 24.1).</p>	<p>The patient had a right middle lobe pneumonia.</p>

(table continues)

Task Orientation in Nonexpert Critical Care Nursing Practice

Examples	Patient Outcomes
I asked the staff nurse what the significance of Mrs. T.'s hemodynamic parameters were. She said she had no idea, that she just took them, wrote them down, and did not know how to interpret them (Field Note 26.10).	Mrs. T. had a rocky course, going in and out of cardiogenic shock. When the team began working collaboratively using therapeutic end-points and appropriate monitoring, Mrs. T. did very well and was weaned off of her vasoactive drugs.

tasks according to physician order and departmental policy; and the physicians performed their tasks according to position within the medical team hierarchy. For example, the physician wrote new orders for ventilator settings, the nurse communicated the orders to the respiratory therapist, and the respiratory therapist made the changes in the ventilator settings. Neither physician, nurse, or therapist were observed to talk to the patient about the changes nor to evaluate patient response to the changes until the arterial blood gas results were available.

In no case was the nonexpert nurse observed to exceed the conventional boundaries of the nursing domain. As discussed under clinical decision making on page 131, the nurses did not function independently in areas traditionally considered to be well within the nursing domain.

Patient advocacy was not observed early in the data collection. Patients and their families were subjected to institutional rules, policies, and procedures, without consideration of their personal needs or wishes. The nurses who had presence communicated well with their patients but no covenants were observed between nonexpert nurses and patients.

Conversion Process

The quantitative component of this study was entitled the "Clinical Advancement of Professional Practice," indicating that the purpose of the overall study was to advance the Medical Critical Care Unit (MCCU) clinical nursing practice. The underlying assumption was that more advanced nursing practice improves patient outcomes. Improved patient outcomes, defined as a reduced incidence of preventable pulmonary complications, were observed after the intervention of an expert nurse based in the MCCU for six months. This qualitative component of the study was designed to describe and explain the process by which the unit-based expert nurse advanced nonexpert nursing practice to improve patient outcomes.

Conversion emerged as the process. Conversion is defined nominally as a change in function and/or attitude; a change from one condition to another, especially to effect a change in function (Stein, 1969, p. 320). The nonexpert critical care nurses were observed to change their practice as the data collection progressed. Further, their practice took on the characteristics of expert nursing practice. The functions and the attitudes of nonexpert nurses became more akin to those of the expert nurse. The data demonstrated that these changes in nonexpert practice were purposeful; the expert nurse consciously and aggressively applied

strategies to produce the changes. The concept of conversion was found to contain the categories of establishing expertise and building a team. These categories and their subcategories are presented in Figure 6.

Establishing expertise. Establishing expertise emerged as a category of the conversion process with credibility and redefining boundaries of the nursing domain as subcategories. The first stage in the conversion process was establishing the credibility of the expert nurse's clinical expertise to the MCCU staff. Table 14 gives examples of establishing expert nurse credibility and the associated patient outcomes.

Establishing expert nurse expertise was achieved within the first few days of the study. The expert nurse selected a patient with a pulmonary complication that could be reversed with independent nursing interventions. The expert independently and single-handedly reversed the complication within six hours. The clinical assessment findings of reversal were corroborated by chest X-ray. The patient's physician provided public recognition of the expert's efforts and entered into a collaborative relationship with the expert nurse. The expert nurse also quickly established credibility with the respiratory therapists. The context chosen for this was the use of equipment perceived to be

Conversion Process

Developing clinical expertise

- credibility
- redefinition of domain boundaries

Building a team

- flexible strategies
- collaboration

Figure 6. Categories and Subcategories of the Conversion Process

Table 14

Examples of Establishing Expert Nurse Credibility and
Patient Outcomes

Examples	Patient Outcomes
<p>I was suctioning Mr. S. using the sigh mechanism on the ventilator and turning the oxygen concentration up to 100%. The respiratory therapist came over and asked if I wanted her to suction him. I said, "No thank you. I'm almost finished." She asked if she could bag him for me and I said no because the bag does not deliver 70% oxygen and Mr. S. needs greater than 70% oxygen. She said the bag gives 100% oxygen. I suggested that we get an oxygen analyzer and analyze the actual oxygen concentration of Mr. S.'s ambu bag. She brought the oxygen analyzer over and it measured 55%. She called over three other respiratory therapists and said, "Look at this. Did you know that 36 inch reservoirs do not give 100% oxygen?" They were surprised so we demonstrated with the 36 inch tubing that the ambu delivered 55% oxygen and that by adding three additional feet of reservoir we could get the oxygen concentration up to between 80 and 90% (Field Note 2.3).</p>	<p>From this point forward Mr. S. and other patients received the appropriate amount of supplemental oxygen during suctioning and other procedures which required use of an ambu bag.</p>

(table continues)

Establishing Expert Nurse Expertise

Examples	Patient Outcomes
<p>There were three nurses in the nursing lounge and on my way out of the unit I spoke with Mrs. B.'s nurse and told her that I really felt that Mrs. B. was a candidate for self-extubation and that she needed to be observed more closely. The next day the Head Nurse told me that Mrs. B. had extubated herself and that when I had left the nursing lounge the other nurses had said, "No, Mrs. B. is not going to extubate herself. S. [the expert nurse] is worrying about nothing. Mrs. B. has never tried to pull her tube out." So the following day, the Head Nurse and the staff nurses wanted to know how I knew Mrs. B. was going to extubate herself (Field Note 7.3).</p>	<p>Mrs. B. extubated herself. Future candidates for self-extubation were watched more closely by the nursing staff. The documented self-extubation incidence rate dropped from 18% to 0%.</p>

exclusively within the domain of respiratory therapy (See the first example in Table 14).

The Medical Critical Care Unit (MCCU) nurses and respiratory therapists challenged the expert nurse's clinical expertise during this time as shown in the two examples of Table 14. The context for the first example included the fact that the MCCU nurses did not suction the patients; they called the respiratory therapist when a patient needed suctioning. Further, the nurses and the physicians did not touch the ventilator settings. A respiratory therapy department policy specified that the therapist make all ventilator changes. Consequently, the nurses and physicians did not manipulate the settings.

By day three of the data collection, the expert nurse was being called by the nonexpert nurses to help with clinical assessment and patient problem-solving. By the second week of data collection, the nonexpert nurses were beginning to exercise opinions about patient interventions. Their opinions were unsolicited, offered tentatively to the expert nurse, and presented in small groups. The nurses requested that the expert nurse express their thoughts to the physicians. The expert agreed to serve as intermediary under the conditions that: (a) the expert concurred with the nurses' opinions, (b) the small group be present while the expert spoke on their behalf, (c) the nurses and respiratory

therapists begin attending patient rounds with the physicians, and (d) that they begin to express their opinions themselves.

Once the expert's credibility was established with the nonexpert nurses, the expert nurse systematically began to build the nonexpert nurses' abilities. Examples of this are provided in Table 15.

Clinical assessment skills, accountability, orientation to patient outcomes, responsibility for patient outcome, presencing, decision making, understanding of interrelationships, patient advocacy, vigilance, and anticipation of patient response were emphasized. The expert pointed out examples of respiratory distress to the nurses, helped them with clinical assessment, differentiated distress into mild, moderate, or severe, demonstrated nursing interventions appropriate to the assessment findings, provided rationale, explained the relationships between the clinical parameters and interventions, and discussed the desired patient outcome from the interventions. By the end of week two, the nonexpert nurses and respiratory therapists were beginning to work together, to take an interest in patient responses, and to generate and test limited, general hypotheses.

Table 15

Examples of Developing Expertise in Nonexpert Critical Care
Nurses and Patient Outcomes

Examples	Patient Outcomes
<p>There was an obvious leak in the endotracheal tube cuff. I walked the staff nurse, the head nurse, and the respiratory therapist through clinical assessment to detect the problem. I showed them the drop in peak inspiratory pressure, had them listen intently to the vocalization sounds and feel the air escape from the mouth and nose. I explained the interrelationships of those clinical assessment findings and why they indicated a cuff leak.</p> <p>Then I showed them how to correct the leak by injecting air into the cuff and using a hemostat to clamp the line between the outer balloon and the endotracheal tube. I showed them how to turn up the ventilator oxygen to 100% and hyperinflate the patient until he was no longer dyspneic and was synchronized with the ventilator. I talked to the patient the whole time, telling him that I knew he was short of</p>	<p>Patient's breathlessness was corrected and he was reintubated after he was stabilized.</p>

(table continues)

Developing Expertise in Nonexpert Nurses

Examples	Patient Outcomes
<p>breath, what the problem was, that I was fixing the problem, that I would help him breathe comfortably again, and that once he was breathing comfortably, we were going to call the anesthesiologist because the tube would have to be changed. I also told him I was showing other nurses how to correct the problem so that if it happened again he wouldn't have to be breathless for long (Field Note 10.4).</p>	<p>The patient remained extubated for the duration of this MCCU stay. The nurses and therapists applied aggressive interventions to keep him extubated.</p>
<p>Both the nurse and the respiratory therapist were angry and in disagreement with the decision to extubate Mr. C. since his gas exchange deteriorated while he had been on the T-piece. So we talked to Dr. D. about why the patient had been extubated. Dr. D.'s rationale was that he wanted to see if Mr. C. would sink or swim. He also felt there was a reasonable chance that Mr. C. would breathe better without the resistance offered by the endotracheal tube.</p>	
<p>After Dr. D. left, I asked the nurse and therapist if they were O.K. with the rationale. They were still grumbling about it and were not committed to following</p>	

(table continues)

Examples	Patient Outcomes
<p>the post-extubation orders. So I talked to them further, pointing out that there was really nothing wrong with the rationale. If Mr. C. sank, a tracheostomy and the potential complications would be the likely outcome. The onus was on us to keep in mind that Mr. C. had a high risk of sinking. I suggested that we have re-intubation equipment at the bedside and that we monitor him very closely while giving him every chance possible to succeed. We agreed to work with hyperinflation, breathing techniques, and intermittent positive pressure breathing treatments to see if we could keep Mr. C. extubated (Field Note 36.5).</p> <p>The cardiac outputs were ranging from a liter per minute one time to 6.5 liters per minute the next time. The intern was basing this patient's fluid therapy on the cardiac output measurements. The nurses told the intern that there was something wrong with the Swan Ganz catheter and that they couldn't trust the numbers they were getting. The intern said the outputs were fine and that he only wanted a ballpark figure. However, he kept making changes in the patient's therapy based on the cardiac</p>	<p>The patient's medical therapy was being changed based on invalid data. The nurses went outside of the normal channels of communication to get this stopped.</p> <p>(<u>table continues</u>)</p>

Examples	Patient Outcomes
output numbers. So the staff nurse called the chief medical resident. He told them to stop doing cardiac outputs and agreed with their reasoning that it was useless, if not dangerous, to be basing therapy on erroneous data (Field Note 61.3).	
We were going to make rounds on Mr. G. but the nurse said, "Well, I'd really like to take my lunch break now because he'll probably be O.K. for the first half hour and I want to be able to keep an eye on him later and stay where I can observe him (Field Note 38.3)	Mr. G. had some difficulty later in the shift. The nurse picked up on the symptoms and initiated early interventions. Mr. G. remained extubated.
This morning I noted a nurse and respiratory therapist evaluating the respiratory care of Mr. F., a patient who developed aspiration pneumonia after his stroke. The physician had ordered ultrasonic nebulization treatments every four hours. The nurse was telling the therapist that Mr. F.'s lungs still had bronchial breath sounds. She had been getting copious yellow secretions from suctioning earlier but now was obtaining only minimal white secretions. The nurse told the respiratory therapist that she thought Mr. F. would benefit from chest physiotherapy and postural drainage. The nurse and therapist decided to do this every four hours (Field Note 62.0).	The next day Mr. F. still had bronchial breath sounds even though the nurses were again suctioning copious yellow secretions. The nurse expressed frustration to the expert nurse that she couldn't clear up Mr. F.'s pneumonia. The expert validated the appropriateness of the interventions, suggested that the frequency of treatments be increased and that hyperinflation be added, and discussed the different time frames with the resolution of pneumonia and noncompression atelectasis. At the end of the shift, the nurse proudly reported that Mr. F. no longer had bronchial breath sounds.

The expert nurse rarely took a patient assignment. Instead she maintained a variable patient case load, for which she coordinated care and therapy. The variable case load was planned to permit the expert nurse to observe and work with all nonexpert nurses and yet leave the expert nurse flexible time for consultation and teaching.

The expert was an available and approachable resource for the MCCU staff as indicated in the first and second examples of Table 15. The expert physically was present in the MCCU approximately eight to ten hours a day and allocated her unit time among both shifts and weekends. The expert conveyed to the staff that she was willing and able to support them.

Nonexpert nurse utilization of the expert as a resource was variable. Nineteen of the MCCU nurses availed themselves of every opportunity to work with the expert nurse. Seven of the nurses did not initiate requests for assistance or collaboration. No relationship was found between nurse demographics and utilization of the expert nurse.

The expert nurse, staff nurses, and respiratory therapists made patient rounds together. The extent of the rounds was dependent on the busyness of the unit. The nurse assigned to the patient presented a brief status report which was followed by the expert's demonstration of an

intervention, sharing of a particular clinical assessment finding, discussion of short and long-term nursing goals for the patient, and a general question and answer period.

During the second month of data collection, some of the MCCU nurses attended selective rounds with physicians. They gave the expert nurse comprehensive medical and nursing reports on new patients admitted to the unit. They expressed their thoughts on clinical assessment, intervention, and decisions to the expert nurse, to each other, and to physicians.

Also during the second month of data collection, the nurses were observed to challenge decisions as shown in the second and third examples of Table 15. The challenge in the second example demonstrated an understanding of the interrelationships between patient response to weaning and decision making on the part of the nurse and respiratory therapist. Additionally, it showed a sense of nurse/therapist responsibility for patient outcome. What the nurse and therapist did not have initially were risk:benefit knowledge of the decision and a commitment to maintain their responsibility to the patient when they disagreed with a decision. The challenge in the third example of Table 15 demonstrated an understanding of the interrelationship between clinical assessment and intervention. Furthermore, it showed the nurses' confidence in their understanding,

their ability to distrust technologically-derived data, an acquired personal knowledge that the data were invalid, and an orientation toward patient outcome rather than task. The nurses had enough confidence and knowledge to risk going outside the formal communication policy.

The "patient rounds" evolved into a mutual exchange of ideas and data. The MCCU nurses taught the expert nurse aspects of medical and nursing care outside of the expert's realm of expertise. The rounds focused on the patient's problems, prioritizing nursing interventions, short-term planning, and, to some extent, long-term planning. Additionally, the nurses were observed to demonstrate presencing, vigilance, and anticipation as shown in the fourth example of Table 15.

As the nurses learned interventions and were empowered to apply them independently, there was often evidence of difficulty applying the interventions appropriately. For instance, the expert nurse had demonstrated how to effectively maintain patient ventilation with an ambu and face mask. The context of the skill demonstration was in the situation of apnea. The nurses then used an ambu and face mask to provide relief for dyspnea in a patient with asthma and severe bronchospasm. The patient responded to the intervention with hysteria and severe shortness of breath. The expert nurse emphasized evaluation of patient

response to interventions and proceeded to demonstrate the appropriate interventions for this patient. The expert drew attention to the patient's response which included relief of dyspnea, abatement of anxiety, drop in heart rate from the 170s to the 120s, and a big smile of gratitude.

Sometimes the application of independent interventions simply needed validation and refinement. In the fifth example of Table 15, the nurse applied the correct interventions appropriately. However, when the desired outcome did not materialize, the nurse was unsure as to what further actions were appropriate.

By the third month of data collection, the nurses were comfortable using other colleagues as a resource. For example, after an emergency chest tube insertion, the physician said that the patient had a large air leak. The nurse asked the physician to show her how to determine whether the patient had an air leak or not. When the physician gave a verbal explanation, the nurse said, "Please show me while you explain."

As their skills increased, the nurses were observed to be more outcome oriented and to demonstrate patient advocacy behaviors. Besides making the individual nurse feel that he or she had made a difference in the patient's care, patient advocacy bonded the staff together. Before taking the risk of violating established rules and policies, the individual

nurse sought validation and support for the proposed action from colleagues. After taking action, the nurses sought validation from the expert nurse. Immediate expert nurse validation was solicited when the nurses feared reprisal. In such cases, the nurses paged or called the expert nurse at home.

By the fourth month of data collection many of the MCCU nurses demonstrated discretionary judgment in their decision making. This progress was most noticeable when viewed in contrast to the judgment of new nurses being oriented to the unit. An example is illustrated in Table 16.

Several MCCU nurses had difficulty developing accountability and presence. Even at the end of data collection these nurses needed tremendous direction and supervision. Clinical skills were not applied and their practice remained that of the nonexpert nurse with a dissociative nursing process and a major dependency component. The second example in Table 16 illustrated the functioning of a senior staff nurse at the end of data collection. The example demonstrated absence of presence, accountability, and discretionary judgment.

Most nurses demonstrated responsibility and accountability for their practice by the end of data collection. When their decision making was followed by an

Table 16

Examples of Discretionary Judgment in Nonexpert Critical
Care Nursing Practice

Example	Patient Outcome
<p>The staff nurse was showing the new orientee how to order a kidney, ureter, bladder (KUB) film for a newly admitted patient. The nurse entered the KUB order into Spectra (the computerized ordering system) and then called Radiology and told them that the order was in Spectra but to hold it and she would call them when the patient was ready for his test. The orientee asked why the nurse put a hold on the film. The nurse explained that the patient was going to need a Swan Ganz catheter and a chest X-ray following the Swan insertion. It would be more efficient for everyone for both films to be taken together. The thinking bypassed the orientee. She had a perplexed look on her face and said, "How do you know Mr. P. is going to need a Swan Ganz?" The nurse hurried to the bedside to get Mr. P.'s lines organized and said, "Just look at him. He's in septic shock." (Field Note 79.10)</p>	<p>The patient was in septic shock. The nurse's judgment resulted in only one trip for radiology and one interruption in patient care for films - after the Swan Ganz was inserted.</p>

(table continues)

Discretionary Judgment in Nonexpert Practice

Examples	Patient Outcomes
<p>The nurse said she wanted to relocate the endotracheal tube with me. However, she seemed to be preoccupied with something else and was distracted while doing the procedure. She kept trying to leave the bedside before we were finished. Beginning to end, I kept having to ask her to come back to the bedside, that we had to check the cuff, we had to secure the tube, etc. As soon as we finished the procedure, she went to the phone. She had a problem with her sick time being credited.</p>	<p>Mr. C. developed hypotension that required medical intervention.</p>
<p>Mr. C. had been extremely agitated and the nurse had given him six milligrams of morphine by intravenous push prior to our repositioning the endotracheal tube. She did not check vital signs after administering the morphine. Mr. C.'s hands were restrained but the rest of his body was not. He'd been quiet since he'd gotten the morphine push, but his activity prior to repositioning the tube had been one of somnolence versus periods of extreme agitation and restlessness.</p>	
<p>The nurse called Human Resources and she sat at the nursing station with her back to the patient... (Field Note 122.9)</p>	

(table continues)

Discretionary Judgment in Nonexpert Practice

Examples	Patient Outcomes
<p>She [the nurse] positioned Mr. C. in the semi-prone position and he coded. She told me she was very frustrated because she was trying to deliver good pulmonary care and yet caused harm to the patient. We discussed that she was hardly responsible for Mr. C. coding. She kept saying aloud, "What was his hemodynamic status before I turned him? Was he unstable? Did I think about that before I turned him?" I helped her work through that there had been no objective indicators of instability and that his response to turning was a new piece of assessment datum that was significant (Field Note 120.4).</p> <p>The nurse came up to the charge nurse and said that G.'s parents would like to spend the night with G. There were two other nurses at the central station. The charge nurse said, "What do you all think?" One nurse said, "I don't see why they shouldn't stay with her if they want to." The other nurse said, "Well, we're not letting M.'s family stay with him. M.'s family asked if they could stay and the Head Nurse said no they couldn't." The four of them</p>	<p>From this point on, Mr. C. had cardiac arrests several times a day, regardless of positioning.</p> <p>G.'s parents spent the night at G.'s bedside. G. died at 6:00 A.M.</p>

(table continues)

Discretionary Judgment in Nonexpert Practice

Examples	Patient Outcomes
<p>discussed the pros and cons and the differences between M.'s situation and G.'s situation. They recognized that the unit policy was no and yet there were very good reasons why G.'s parents should be allowed to stay with her. The four of them finally came to the decision that yes, G.'s parents could stay (Field Note 119.6).</p>	

untoward patient response, the nurses were observed to express self-admonishment verbally over what they may have missed. This was illustrated in the third example of Table 16.

The nurses also took pride in their accomplishments as evidenced by comments such as "Look at this great tape job! I bet I could pull the patient's head right off the pillow by pulling the tube and still there would be no movement of that endotracheal tube!" and "I know I made a difference in Mrs. T.'s recovery. I told her we'd pull her through this and we did."

Their practice was observed to be less governed by rules, policies, and procedures. Patient and family needs were considered in decision making and the nurses were able to articulate the rationale for their decisions. In the fourth example in Table 16, the nurses also had to consider a recent contrary decision by the Head Nurse. Yet, they considered the individual patient and family needs and made a decision that conflicted with unit policy.

The conditions for developing expertise were several. The expert nurse had credibility as an expert; the nonexpert nurses did not have credibility as experts. Over the course of the six months of participant observation, most of the nonexpert nurses developed competency in critical care nursing practice. Their development did not make them

expert nurses but it clearly moved them further along the novice to expert continuum of practice. Some of the nurses did not develop observable competency during the time of this study, as illustrated in the second example of Table 16.

The expert nurse was available on a daily basis to the nonexpert nurses for a six month duration. The expert served the functions of unit clinical resource, teacher, coach, sounding board, and validation check point. The expert nurse consistently recognized the staff nurse as having primary responsibility for the patient's care. While the expert assumed situational responsibility for hypothesis-testing in patients, the consistent message emphasized by the expert was the nurse's central role in patient care. This was reflected in the emergence of the theoretical construct of empowerment, which was identified in 49 substantive codes (Appendix D). The expert nurse promoted the development of staff nurse clinical knowledge and skill by role modeling, mentoring, encouraging, supporting, teaching, and validating the emphasized attributes and skills.

The consequences of the nonexpert nurses developing knowledge and skill included less dependence on technology and greater confidence in physical assessment data, greater staff nurse time at the bedside, detection of invalid and

unreliable data for clinical decision making, orientation to patient outcomes, evaluation of interventions, more aggressive and independent interventions, use of human resources, patient advocacy, discretionary judgment, responsibility for patient care, and accountability for practice. Tangible patient outcomes of reduced preventable pulmonary complications were demonstrated during the quantitative portion of the study. These qualitative study data provided many examples of improved individual patient outcomes, some of which have been discussed in this chapter.

Redefining boundaries of the nursing domain emerged as a subcategory of developing expertise. Redefining boundaries was one of the Level III constructs and included the Level II categories of setting standards and expectations, mobilizing resources, supervising, change agent, and admonishing. It was defined as circumscribing the boundaries of the realm of action, thought, knowledge, and responsibility of critical care nursing.

From the descriptions of expert and nonexpert critical care nursing practice, it is evident that the domain boundaries of the expert nurse were broader and more context-dependent than the domain boundaries of the nonexpert nurse. Expert nursing practice clearly encroached on both the medical and respiratory therapy domains, as conceived and accepted within the medical critical care

unit. The boundaries of nursing, as practiced by the expert nurse and as advocated by the expert for the nonexpert nurse, consistently and without exception were defined by patient response. Table 17 provides examples of redefinition of nursing domain boundaries and the associated patient outcomes.

Functions within the respiratory therapy domain, such as monitoring in-line ventilator airway temperature, ensuring functional ventilator alarms, adjusting ventilator settings, and maintaining respiratory therapy equipment were appropriately placed. However, patient safety and security mandated that such functions could not be exclusively in the respiratory therapy domain. The data were replete with examples of airway temperatures high enough to cause thermal injury and low enough to cause mucosal drying and ciliary dysfunction. The expert nurse repeatedly stressed the need for the nurse to monitor all aspects of the patient-ventilator interface, in conjunction with the respiratory therapist. The expert argued for the nurse to understand the ventilator settings and alarms and their interrelationships intimately enough to permit the nurse to make emergency adjustments. Although suctioning was in the exclusive realm of respiratory therapy prior to this study, suctioning quickly became a function of the nursing domain. This was based on the suctioning research literature which

Table 17

Examples of Redefining Domain Boundaries and Patient Outcomes

Examples	Patient Outcomes
<p>Mrs. S. spiked a fever every four hours like clockwork. I asked her nurse when we could give Tylenol. The nurse said that we call a physician the six times a day when Mrs. S.'s temperature is 102 degrees or higher and then the physician orders a dose of Tylenol. I asked the nurse to call the physician and get a PRN (as necessary) Tylenol order. I asked her to get from the physician the amount of the drug, the frequency range for administration, and the temperature range for which it could be administered (Field Note 3.2).</p>	<p>The patient received Tylenol whenever her temperature went up to the range specified. However, the nurses had the discretionary ability to decide when and where within the range they administered the drug.</p>
<p>We [the Chief Medical Resident, staff nurses, and the expert nurse] had come to agreement on the therapeutic end-points for Mrs. T.'s hemodynamic status. The Chief Medical Resident volunteered to accept the responsibility for conveying the end-points to the intern who is writing orders for Mrs. T.</p>	<p>The therapeutic end-points had been agreed upon as being optimal for Mrs. T. The method to achieve the end-points did not get implemented. When the orders finally reflected the goals, the expert nurse remained available to coach the nurses and housestaff with implementation. Mrs. T. responded as expected when the therapeutic goals were attained. She became more</p>
<p>Later the intern wrote new orders that included "maintain</p>	<p>(<u>table continues</u>)</p>

Redefinition of Domain Boundaries

Examples	Patient Outcomes
<p>pulmonary artery wedge greater than 22, maintain SVR [systemic vascular resistance] between 900 and 1100" and then he ordered fixed rates for the nitroprusside and dobutamine.</p> <p>The staff nurse's response to the orders was, "These are crazy! How can we keep the wedge between 20 and 24? How can we keep the SVR between 900 and 1100?" (Field Note 34.6).</p>	<p>responsive and started producing urine.</p>

makes a strong case for performance of the suctioning intervention when indicated, and only when indicated, by patient response.

The expert nurse urged that drug therapies previously within the MCCU physician domain become part of the nursing domain. The first example in Table 17 illustrated the inefficiency of therapies being exclusively within the medical domain. The patient in that incident endured predictable fever while the nurses repetitively solicited antipyretic orders.

As reflected throughout the findings, the expert nurse encouraged the use of therapeutic guidelines. The use of therapeutic guidelines forces the physician to articulate the desired patient outcome from the therapy and forces the nurse to make decisions regarding administration of the therapy based on patient response. Therapeutic guidelines compel an outcome orientation. The transition from task orientation to outcome orientation was difficult and lengthy. Even when the desired outcome was articulated and communicated, nurses and physicians needed tremendous support to achieve the desired patient response, as illustrated in the second example of Table 18. The need for nurse flexibility in titrating drug dosage to achieve therapeutic end-points was emphasized again and again to the housestaff and nurses.

Essential nursing domain functions espoused by the expert nurse included clinical assessment, monitoring, preventing complications, detecting complications, establishing short-term and long-term patient outcome goals, initiating interventions, implementing interventions, evaluating interventions, and being a patient advocate. The boundaries of the domain were viewed as fluid and circumscribed by patient response and nurse expertise.

By the end of data collection, the nursing domain boundaries had been redefined in nonexpert nursing practice. However, the boundaries were not observed to be redefined uniformly. The nurses who had developed competency over the course of the study were observed to redefine their practice boundaries situationally and extensively. These nurses were observed to practice within fluid boundaries. They made decisions about visiting privileges based on individual patient and family needs rather than exclusively according to unit policy. They evaluated patient responses to respiratory care and therapy rather than relying solely on the respiratory therapist's evaluation. They administered and titrated drugs according to therapeutic end-points rather than by specific physician order. They assessed the patient during and after interventions in addition to the initial change of shift assessment. They initiated

interventions to prevent complications and to move the patient toward recovery.

In contrast, the nurses who did not develop competency during the study redefined their practice boundaries to accommodate new functions, such as suctioning patients, but continued to practice within fixed boundaries, albeit new ones. There was no evidence of decision making based on the situational context. These nurses continued to make decisions circumscribed by fixed rules, policies, and procedures.

Building a team. Building a team emerged as a category of the conversion process. Team building was a Level III construct and included the Level II categories of communicating, suggesting, teaching, empowerment, and developing staff professionalism. Building a team was defined as creating cooperation within the MCCU staff to accomplish a common goal of improved patient outcomes. Building a team was found to contain the subcategories of flexible strategies and collaboration.

Flexible strategies was defined as the method the expert nurse used to convert the MCCU staff from an isolated, detached, task-oriented practice to a collaborative, involved, outcome-oriented practice. The methods were multiple and situation-dependent. The expert nurse was observed to use experimentation, humor, coercion,

suggestion, analytical thinking, games, demonstration, "thinking aloud" (Corcoran, Narayan, & Moreland, 1988), and nonparticipation in her repertoire of strategies. The strategy of thinking aloud is used for illustration in Table 18.

The expert nurse was observed to use "thinking aloud" frequently. She used thinking aloud in the presence of nurses, physicians, respiratory therapists, patients, and families to generate and test hypotheses and to envision patient outcomes. Thinking aloud in the first example of Table 18 resulted in additional diagnostic tests and closer monitoring of the patient's neurological status. From the incident forward, the neurology team and the nurses caring for Mrs. A. communicated frequently regarding neurological assessment findings and the diagnostic test results. When Mrs. A.'s brain tumor was diagnosed, the nurses, physicians, and family together set the goal to get Mrs. A. extubated and back to her family. The second example illustrated the expert nurse's thinking aloud for hypothesis-testing and envisioning patient outcome in the same patient. The nurses and physicians knew the patient's diagnosis. The physician, however, did not want the patient to know that he had cancer. The expert nurse did not know anything about the patient, except that he was often alone and looked despondent.

Table 18

Examples of Flexible Strategies and Patient Outcomes

Examples	Patient Outcomes
(Thinking aloud)	
The neurology team was at the bedside doing a neurological exam. I was very interested in the findings and noted that there were focal signs. I was talking this through, saying, "Mrs. A. has left-sided hyperreflexia and a left Babinski. Alzheimer's is a generalized disease. I wonder what else is going on besides Alzheimer's. These findings do not go along with hypoxic encephalopathy or with the dementia of Alzheimer's. Since Mrs. A. is nonresponsive to pain and level of consciousness cannot be followed, we better monitor her for signs and symptoms of transtentorial herniation." When the neurology team left, the staff nurse asked if I would go over the neuro exam with her so that she would be very clear in her mind what signs and symptoms would indicate transtentorial herniation (Field Note 96.4).	The neurologist ordered a cat scan and discussed possible acute problems that could explain the findings. Mrs. A. had a brain tumor, the symptoms of which had been masked by her Alzheimer's disease.

(table continues)

Flexible Strategies

Examples	Patient Outcomes
<p>I had been watching this man across the unit while I helped [the staff nurse] with Mrs. O. I didn't see anyone with him all morning. He looked melancholy and alternated between looking at his cardiac monitor pattern and out the window. When we had Mrs. O. stabilized, I went over to him, introduced myself, and said, "I've been watching you all morning from across the unit. You seem sad. What's wrong?" He said, "They don't know what's wrong with me. I had surgery on my esophagus three months ago and now there's something wrong with my heart. I wish they'd tell me what's wrong with me." He then proceeded to tell me about all the responsibilities he had for his wife, children, job, and house. As he was talking, his eyes continued to flit between the monitor and the window. He did not look at me. When he became quiet, I asked if there was anything I could do for him. He asked me to crank up the head of the bed.</p> <p>As I was cranking up the bed, I said, "You don't</p>	<p>Mr. D. had metastasis to his pericardium. His prognosis was a month to six weeks. Mr. D. was not alone from then on. His wife, children, attorney, business partner, and friends came and went. The envisioned outcome was realized to the satisfaction of Mr. D. and his wife. The nurses and physicians frequently were seen at the bedside discussing plans with Mr. D. and his wife, such as pain relief, therapeutic intervention options, and resuscitation efforts.</p>

(table continues)

Flexible Strategies

Examples	Patient Outcomes
<p>have cancer, do you?" He looked at me, his eyes welled with tears, and he sighed heavily. "Yes, I have cancer. Nobody will tell me so. But I'm not stupid! I've known I have cancer since the surgery. I haven't been able to talk about it with anyone because I'm not supposed to know. I know my wife knows and she's scared." He started crying and said, "I'm scared too."</p> <p>About this time, the medical team came into the unit. I called the physicians and the nurses over to Mr. D.'s bedside. I said, "Well the cat is out of the bag. Mr. D. knows he has cancer." The whole team of physicians literally stepped back a few paces from the bedside. I heard a nurse behind me mutter under her breath "--it. We're in trouble now."</p> <p>Mr. D. was quietly scanning the faces surrounding him. I turned to Mr. D. and said, "What do you want to know?" He looked at me and said, "I want to know how long I have to live."</p> <p>I turned to the attending physician and said, "Mr. D. has many responsibilities. He would probably like to ensure that those responsi-</p>	

(table continues)

Flexible Strategies

Examples	Patient Outcomes
<p>bilities are met while he is capable of taking care of them. If you can give him an approximate prognosis, we can help him work this through with his wife and family. He can get the things taken care of that he needs to and he and his wife can share their fears and other feelings."</p>	

The field notes contained three subsequent examples of similar situations to the two examples in Table 18. The nurses and physicians were observed to discuss the patient's condition with the patient and family as a team. The MCCU staff were not detached and the patients were not isolated. The nurses even requested that they be assigned to terminal patients for the course of the patients' critical care stay.

The expert nurse used different strategies throughout the conversion process. Early in the data collection, the strategies were observed to be more active, designed to make an impression on the staff. Coercion, demonstration, return demonstration, dramatics, and games were frequently used. The strategy varied according to the nonexpert's level of expertise. For instance, coercion and dramatics were used with nonexpert nurses without presence to get them to stay at the bedside, set the monitor alarms, be responsive to patients, etc. Demonstration and return demonstration were used with nurses who exhibited presence to help them develop their clinical assessment and decision making skills. Games were used in situations where the nurse, physician, or therapist showed verbal or nonverbal signs of being threatened.

As the data collection progressed, the expert's strategies were observed to be less active and to consist mostly of thinking aloud, suggesting, discussing,

validating, and nonparticipation. The expert nurse was preparing for her withdrawal from the study unit and the majority of the nonexpert nurses was practicing competently. The expert's role became more consultative and characterized by less direct involvement.

Collaboration. Collaboration was considered a subcategory of team building, as well as a category of independent practice in expert critical care nursing. Collaboration included the Level II categories of consultation, helping, assertiveness, and conflict resolution. Collaboration was defined as the patient care team sharing responsibility for individual patient outcome. Several examples of collaboration were illustrated previously in this section (See the fifth example in Table 15, the fourth example in Table 16, the second example in Table 17, the second example in Table 18) so further examples are not provided here.

Collaboration was evident in expert critical care nursing practice and noticeably absent in nonexpert critical care nursing practice early in the study. The nonexpert nurse task orientation was observed to promote abdication of responsibility for the patient's welfare and progress. Communication was limited to information surrounding tasks, such as the respiratory therapist telling the nurse that the patient's monitor alarm was going off and the nurse telling the therapist that a ventilator alarm was cycling. Neither

event was perceived to be related to the other or to the patient's welfare. The focus was on fixing the alarms, not on fixing the patient's problem. As data collection progressed, nurses were observed to respond to patient alarms. Both nurse and therapist checked alarms within their respective jurisdictions, looked at the patient, and hypothesized what might have caused the alarm activation.

Therapeutic guidelines were observed to be a major facilitator of collaboration. The use of therapeutic guidelines forced the nurses, physicians, and therapists to consider patient outcome in the care and therapy. Since the nurse had the responsibility for administering, evaluating, and varying the intervention based on the therapeutic guidelines, the nurse had a vested interest in the outcome. If the outcome was not being achieved, the nurse contacted the physician with data to discuss what could be done differently. While the input into decision making often was inequitable, at least the members of the team were observed to begin communicating and sharing responsibility for patient outcome.

Collegial interactions occurred among nurses and between nurses and respiratory therapists first. Then followed collegial interactions among all patient care team members, which often included patients and families, as the study progressed.

In the first couple of weeks of data collection, the data demonstrated a strained relationship between the nurses and respiratory therapists. Comments to the expert nurse by staff nurses included: "Can you talk to that respiratory therapist? They want to do this and I think it's wrong." "The physician wants this [an intervention]; the therapist wants that [another intervention]. They are arguing back and forth and I'm not sure what should be done." "The therapist told me not to touch that and I feel like I should be allowed to touch it." The expert nurse, in all observed instances, brought the nurse and therapist together at the bedside. She addressed the problem directly with both parties in attendance and encouraged them to talk the problem through. In one example, the respiratory therapist thought that chest physiotherapy was useless for a 350 pound patient with Pickwickian Syndrome. The therapist grumbled about the order and refused to implement it. The nurse was upset about being in the position of having to communicate the therapist's refusal to carry out the order to the physician. The expert nurse had them talk through the possible benefits to the patient from the treatment and hypothesized aloud why the physician might have ordered the therapy. The therapist and nurse decided that they would try the intervention and see what happened to the patient as a result.

Reasons for the precedence of nurse-therapist collaboration were supposed to be that both the nurses and therapists were unit-based, and therefore with the patient more often than physicians. The greater patient contact provided increased opportunities to establish, and to work toward, patient outcome goals. The nurses and therapists also had consistent exposure to the expert nurse and, therefore, more opportunities for assistance with conflict resolution and accountability.

The conditions that promoted collaboration were developing nursing expertise, with concomitant accountability, and facilitating conflict resolution. The expert nurse used flexible strategies to achieve both conditions. The context in which collaboration developed and progressed was a patient outcome orientation. The focus on patient outcomes set the stage for dialogue and collegial interactions among the nurses, therapists, and physicians. The consequences of collaboration included reversal of patient complications, prevention of complications, responsiveness to individual patient and family needs, the use of therapeutic end-points, and an orientation toward patient outcomes.

The Emerging Theory

The tasks of memoing and sorting were done to discover and conceptualize the essence of the interactional process between the expert nurse, nonexpert nurse, and patient outcomes. Continuous reference to the data illuminated conversion as the explanation of the interactional process. Conversion linked the data together and explained much of the variation in the data.

There was variability in the advancement of practice among the study participants. Presence emerged as the characteristic that differentiated those who changed their practice (18 of the 26 participants, or 69% of the sample) and those who remained at the nonexpert level (eight of the 26 participants, or 31% of the sample). The nurses who either had or developed presence advanced their practice; those who did not develop presence did not advance their practice.

That well-developed perceptual abilities are essential to the development of expert skill was advanced by Polanyi (1962), Benner (1982, 1983, 1984, 1989; Benner & Wrubel, 1989), Pyles and Stern (1983), Benner and Tanner (1987), Young (1987), and Smith (1988). It follows that perceptual abilities cannot be developed if the nurse is not with the patient.

Young (1987) and Smith (1988) identified direct patient contact as a necessary condition for perception in nursing. Young (1987) also identified energy, defined as a readiness on the nurse's part to receive information from the patient, as a necessary condition. Energy can be equated with presence, defined in this study as being with the patient in the physical or spiritual sense. Consistent absence of presence suggests that the nonexpert nurse views the patient as separate and distinct from the environment. Therefore, the nonexpert nurse can manipulate environmental objects without recognition of the patient being inseparably related to the objects. The nurse then has no reason to search for and evaluate patient cues and responses.

The development of expert skill is context-dependent (Heidegger, 1949; Polanyi, 1962; Dreyfus, 1979; Dreyfus & Dreyfus, 1980; Benner, 1982, 1983, 1984). The nurse with presence views the patient and environment as a single context. The interrelationships of the context are grasped as a whole and patterns emerge as similar and dissimilar contexts are experienced.

Grasp of the situational context in nursing must include involvement with the patient. As the nurses in Benner's study (1984) described a committed, involved relationship with the patient, the expert nurse and the nonexpert nurses who advanced their practice in this study

demonstrated involvement. Presence necessitates involvement, minimally in the physical sense.

Presencing was defined in this study as sensory perception in the absence of explicit objective data. Since subjective cues cannot be received if the nurse is not with the patient, presencing can not occur without presence. These data demonstrated that presencing was a factor in discretionary judgment in expert nursing practice; three-fourths of the examples of expert discretionary judgment involved subjective cues. The data further demonstrated presencing was a factor in the development of discretionary judgment in the nurses who advanced their practice, as shown in the third and fourth examples of Table 17.

Human beings need the concrete, real, and contextual. If these personal mental processes are missing, the person becomes distant, detached, and mechanical. Oliver Sacks (1985) wrote about a patient with a neuropsychological disorder in which judgment was impaired.

"He faced me as he spoke, was oriented toward me, and yet there was something the matter - it was difficult to formulate. He faced me with his ears, I came to think, but not with his eyes. These, instead of looking, gazing at me, 'taking me in,' in the normal way, made sudden strange fixations - on my nose, on my right ear, down to my chin, up to my right eye - as if noting (even studying) these individual features, but not seeing my whole face, its changing expressions, "me", as a whole" (Sacks, 1985, p.8).

Dr. Sacks' patient is a parable of what happens when a person eschews the judgmental, the particular, the personal, and is entirely abstract and distant. The study data offered subtle and blatant examples of the nonexpert nurse viewing the patient as component parts rather than as a whole. Nonexpert nurse focal awareness (Polanyi, 1962) on tasks and technology precludes awareness of the particular, contextual, and personal. Discretionary judgment cannot be developed with the cognitive processes alone. Understanding of the contextual processes is needed.

In this study, knowledge and skill acquisition were simultaneous in the nurses who advanced their practice; the art of doing and the art of knowing were achieved together. This finding supports Polanyi's (1962) assertion that skill shapes knowledge. While the nonexpert nurses were learning assessment skills, total concentration was required. The examples of the nurse calculating the dosage of drug per minute and the nurse and residents trying to interpret the pulmonary artery wave form illustrate the notion of focal awareness. The skill acquisition consumed available energy.

Focal awareness negates a Gestalt or perception of the context because all the available energy is focused on the skill. The skill must be moved into an instrumental extension of the body to free up energy for contextual perception. Movement of skill into the nonexpert nurse's

subsidiary awareness was achieved by valuing the skill as a means to an end, rather than as an end itself. An outcome orientation facilitated valuing the skill as a means.

As the nonexpert nurse began to focus on patient outcomes instead of tasks, the skills were seen as a means to the end. This change in focus facilitated moving skill acquisition into the subsidiary awareness and permitted other aspects of the context to be realized. Personal energy was diverted away from the skill as focal to the patient response as focal. Knowledge is acquired simultaneously when skills are instrumental. The purpose of the skill and the relationship between skill and purpose become integrated.

Melding of patient and environment and knowledge and action suggests interrelationships. The description of skill acquisition given by the nurse in Benner and Tanner's (1987) study on clinical judgment illustrated this point. The nurse talked about seeing the veins dilate and contract in response to the drug therapy. Until melding occurred, the nurse had not personalized the interrelationships between patient physiological response and vasoactive drug.

When interrelationships are understood, possibilities can be considered. An example of skilled knowledge thinking is: "If I increase this dosage, the veins will dilate, the vascular resistance will drop, cardiac output will increase,

and the patient will become more alert. However, since the patient may or may not respond as expected, I will test the hypothesis within the context of vigilance." The consideration of patient response is critical here. It directs evaluation of the intervention and, in fact, dictates the intervention. Without an anticipated patient response, the sense of possibility is absent. The nurse's behavior then reverts to task orientation and carrying out an order that has no particular relevance to the context.

The example above further illustrates the understanding that the patient is an individual who may not respond to the intervention as other patients respond. Nurses with skilled knowledge recognize that patterns of response exist and therefore vigilance is required to see which pattern the individual patient will exhibit.

Skilled knowledge in critical care nursing practice is complex. To use an example from this study, the reader is directed to the second excerpt in Table 6 in which the expert nurse noted that the patient was being suctioned with an ambu bag with a three foot reservoir tubing. At a glance, the expert nurse related the equipment used for suctioning to the context (the patient's diagnoses and mechanical respiratory assistance). She knew the patient's physiological needs exceeded the capacity of the equipment to meet those needs.

Even with deliberate and analytical thought, the nonexpert is unlikely to arrive at the same conclusion. The nonexpert could think through the following reasoning process: Mr. S. has adult respiratory distress syndrome (ARDS). ARDS is characterized by hypoxemia. This is validated in Mr. S. by the need for 70% oxygen and 10 centimeters of positive end-expiratory pressure (PEEP). The need for 70% oxygen and 10 of PEEP indicates refractory hypoxemia. Refractory hypoxemia indicates shunting. Shunting translates to a significant drop in blood oxygen with even a momentary lapse in oxygen and PEEP support. The suctioning procedure demands a lapse in oxygen and PEEP support. Suctioning itself causes hypoxemia. Mr. S. requires suctioning. To prevent a dangerous drop in blood oxygen level, suctioning needs to be accompanied by maximal oxygenation support (100% oxygen) and maintenance of PEEP. The methods available for delivering 100% oxygen and maintaining PEEP are: (a) use of the ventilator primed with 100% oxygen, or (b) use of the ambu bag with 10 feet or more of reservoir tubing, the oxygen flow meter at flush, and a PEEP valve.

The reasoning process is based largely on formal knowledge. However, the nonexpert needs to be familiar with the literature on ARDS, oxygenation, hypoxemia, suctioning, and PEEP to integrate all the points covered in the

reasoning process. Even then, "knowing that" is different from "knowing how". The nonexpert may have the formal knowledge but be unable to apply it contextually.

The expert nurse had internalized the interrelationships so that "at a glance" the problem became obvious, relevant, and solvable. Since Mr. S.'s equipment and condition had been unchanged for at least 24 hours, it is assumed that the MCCU nurses, respiratory therapists, and physicians either did not know the interrelationships or did not look for them. To synthesize and internalize the interrelationships required background experience with patients with ARDS, observational skills, and inquiry.

The notion of inquiry is related directly to observational skills and understanding interrelationships. Mr. S., in the above example, had dangerous dysrhythmias during suctioning. An inquiry as to why the patient responded in such a way would have spurred a search for interrelationships and appropriate interventions. The nonexpert nurse in this study who questioned why the patient arrested with positioning (third example in Table 17) demonstrated the integration of inquiry, observational skills, and interrelationships.

The differences between expert and nonexpert critical care nursing practice are summarized in Figure 7. The expert nurse practices within the framework of

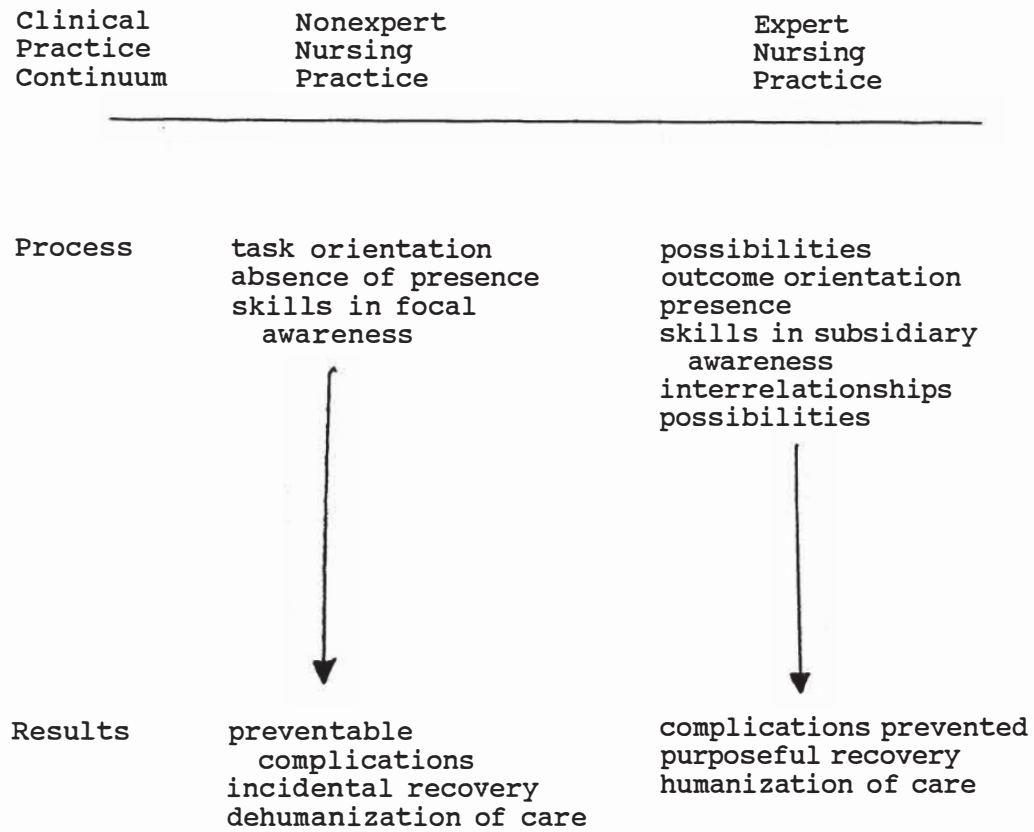


Figure 7. Differences Between Nonexpert and Expert Critical Care Nursing Practice

possibilities. The consideration and realization of possibilities requires an outcome orientation.

Consideration and realization of a particular patient outcome requires presence. Presence requires involvement with the patient in relation to the situational context. When presence exists, the focus is on the patient response and outcome, and skills recede into the nurse's subsidiary awareness. Focusing on patient response permits the nurse to see the interrelationships between patient response and care and therapy. Understanding the interrelationships suggests further possibilities. This process of nursing practice leads to skilled knowledge. The nurse's practice advances on the practice continuum and the quality of patient outcomes is improved. Complications are prevented, recovery is purposeful, and the patient's care is humanized.

In contrast, the nurse who does not practice within the framework of possibilities demonstrates a task orientation. Since the performance of task is the goal, presence with the patient is not required. Skills remain in the nurse's focal awareness. Since the nurse focuses on the skill to the exclusion of focus on the patient response, interrelationships between the two are not understood. This process does not lead to skilled knowledge; the nurse's practice remains at the nonexpert level. The quality of patient outcomes suffers from nonexpert nursing practice. Complications are

not prevented, recovery is not encouraged, and the patient's human needs are not met.

In this study, the expert nurse offered the perspective of possibilities to the nonexpert nurses. It is hypothesized that this perspective contributed to a reengineering of practice in the 69% of the sample who advanced their practice.

The expert looked for congruency between what the patient or family desired and what she thought was possible, and then mobilized resources to help realize the possibility. A paradigm case was a 76 year old man with chronic obstructive pulmonary disease. The gentleman had acquired pneumonia, developed acute respiratory failure, and had been ventilator-dependent in the critical care unit for months. The medical decision was to transfer the man to a skilled care facility. The patient and his wife feared the transfer meant permanent dependence followed by certain death. The expert nurse concurred with their fears.

After discussion with the patient and wife, nurses, and physicians, the expert proposed an aggressive rehabilitation program. The patient and his wife enthusiastically and voluntarily committed to work toward the possibility of the patient regaining his independence, even though they recognized it might be short-term. A time frame was established for the rehabilitation effort and acceptance of

the trial effort was obtained from the nurses and physicians. The rehabilitation effort was successful. The patient was transferred from the critical care unit to his home, walking and without ventilator assistance, two weeks later.

Seeing possibilities realized, as in the above case, infused dignity, meaning, power, and community into the MCCU nurses' practice. Envisioning what can be, rather than accepting what is as inevitable, imbues energy, optimism, and commitment. Images of potential focus awareness away from tasks and toward purposeful action to actualize the potential. Aspiration is a powerful mechanism for team building (Weisbord, 1988). It tends to bring people together in their goals and attitudes, rather than heightening their differences. Instead of being problem centered, possibilities link the personal mental processes to the context.

The processes outlined in Figure 7 are hypothesized to be circular. In this study, the expert nurse introduced possibilities in terms of patient outcomes into nonexpert nursing practice. The nonexpert nurse who had, or developed, presence was able to enter the cyclic process of expert nursing practice. The nonexpert nurse who did not develop presence remained within the cyclic process of nonexpert nursing practice.

The conversion process was facilitated by the expert nurse with both active and passive strategies. Active strategies consisted of those discussed under developing expertise and team building. Of those strategies, teaching and mentoring merit further comment.

In the traditional teaching relationship, the interaction tilts heavily toward the more experienced person being active and the less experienced person absorbing passively (Hamilton, 1981). This type of interaction was seen in the data between the expert nurse and the nonexpert nurses who did not advance their practice. However, the 69% of the sample that advanced their practice did not absorb passively. They expended a great deal of energy and mental effort to incorporate possibilities, outcome orientation, presence, subsidiary skills, and interrelationships into their practice.

A concept analysis (Walker & Avant, 1983) on mentoring by the researcher revealed three provisional criteria that identify mentoring: (a) the evolution from parental-peer mixture status to peer status, (b) the promoting of both personal and professional growth of the protegee, and (c) the guidance of the interactions by vision.

Levinson's (1978) comprehensive, longitudinal study on the developmental phases of male adulthood identified the significance of a mentor on career development as critical.

The mentor served as a transitional figure who possessed the qualities the young professional hoped to acquire. The mentor provided the following to the novice: (a) enhancement of professional skills and intellectual development, (b) facilitation and influence of the novice's professional advancement, (c) counsel and moral support during times of stress, (d) encouragement for risk taking, (d) sponsorship and invitation into the real working world, and (e) practical help and guidance with the challenges of the profession.

The protege initially presents as a novice to the more advanced, expert, and authoritative mentor. As the relationship evolves, the protege gains confidence in his or her own authority, expertise, and advancement. The protege becomes comfortable with self capability for autonomous, responsible action (Levinson, 1978).

Mentoring was operable in this study to some extent. An acknowledged mentoring relationship occurred between the expert nurse and two nonexpert nurses. These relationships contained all three provisional criteria of mentoring and continued beyond the study. Although the provisional criteria were not formally acknowledged between the expert nurse and the remaining nonexpert nurses, many of the expert nurse-nonexpert nurse interactions were characterized by the mentoring functions outlined by Levinson (1978).

The passive strategies used by the expert nurse to facilitate the conversion process were defining the expert nursing process illustrated in Figure 7 and holding the power of expertise. The expert nurse defined and redefined possibilities, outcome orientation, and patient response. Definition and redefinition occurred through expert nurse actions and words. The expert demonstrated the process in her own practice and coached the process in nonexpert practice. Through exposure to the expert nurse process, the majority of MCCU staff became converts to the expert process. They learned a new set of practice expectations and began to contour their own practices accordingly.

Significant to the conversion process is the concept of free choice. Conversion was not imposed on any nurse. The individual nurse chose whether to reengineer his or her practice.

One can argue whether the choice to convert was free in the pure sense of the word. The expert nurse represented power at a distance. Although unspoken, the expert was acknowledged as the liaison with internal control agents (e.g., the Head Nurse, Nursing Director) and external control agents (e.g., physicians, hospital administrators).

However, the expert nurse in this study was in a staff position as opposed to line. Any authority the expert had was professional authority (Stevens, 1976), defined as power

and influence resulting from knowledge and expertise. Professional authority cannot be mandated; it is granted by peers to the person, not to the position. Further it is granted by choice.

To quote Korda (1981, p. 8), "People can only be led where they want to go." The fact that the expert nurse was embraced into the MCCU milieu so quickly suggests that the MCCU staff wanted to change the status quo. The fact that 19 of the 26 participants frequently utilized the expert nurse as a resource suggests that the majority of nonexpert nurses wanted to change their practice. What the expert nurse did was help the nurses focus their energies and desires, introduce them to possibilities in patient care, and make what the nonexpert nurses already wanted seem attainable, important, and within their grasp.

Holding the power of expertise facilitated role modeling. A role model has been defined as a person whose demonstrated expertise, personal value system, philosophies and attitudes, and behavior is seen as a standard of excellence by the novice nurse with which to compare his or her own attributes (Hurley, 1978; Lum, 1978). The novice sees the role model as an individual from whom one can learn, imitate, and identify with. The novice then attempts to internalize the role model's actions and beliefs. The process of role modeling is based on the psychiatric and

social psychology concept of identification. The novice chooses whether, how much, and to what degree emulation is sought (Hamilton, 1981).

Role modeling was a process within the expert nurse-nonexpert nurse interaction in this study, although to what extent is unknown. Several nonexpert nurses verbalized to the expert nurse and others that they wished to become a nurse just like the expert.

In summary, the conversion process consisted of active and passive strategies to facilitate the categories of developing expertise and building a team. The conversion process was conceptualized as shown in Figure 8. The expert nurse, with a Gestaltic nursing process and significant independent practice component, offered a new perspective on the possibilities of nursing practice to the nonexpert nurse with a dissociative nursing process and significant dependent practice component. Given that the level of nursing practice varies on a continuum (Benner, 1982, 1983, 1984; Benner & Wrubel, 1989), the majority of nonexpert nurses advanced along the practice continuum toward the expert level. They did not achieve the expert level of practice but realized an integrated nursing process and significant interdependent practice component.

Together, the active and passive strategies used by the expert nurse to facilitate conversion represent the master-

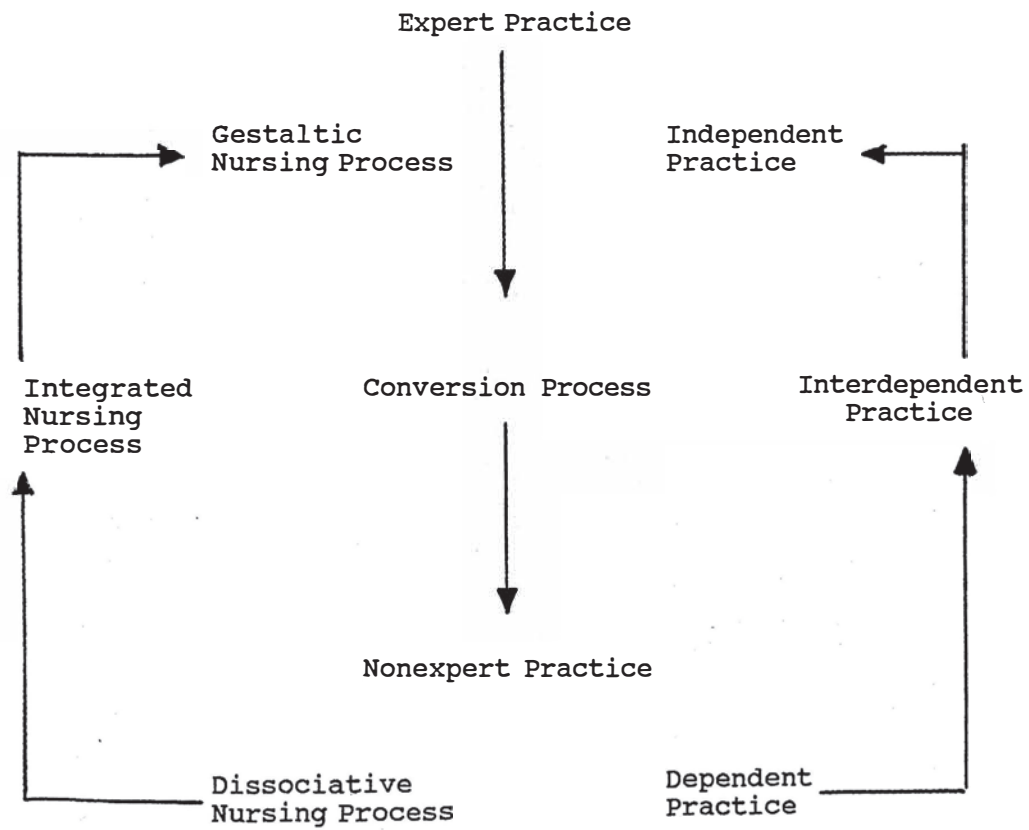


Figure 8. Conceptualization of the Conversion Process

apprentice relationship described by Polanyi (1962), in which skilled knowledge is transmitted personally from the master to the apprentice. Three conditions exist for such a relationship: (a) the master (expert) must be available to the apprentice (nonexpert), (b) the expert must be willing to transmit personal knowledge to the nonexpert, and (c) the nonexpert must choose to follow the expert.

The conversion process contained the characteristics of developing expertise, with its categories of credibility and redefinition of domain boundaries, and building a team, with its categories of flexible strategies and collaboration. Conversion explained the process by which the expert nurse advanced the practice and decision making of nonexpert nurses in this study. The expert offered a vision of the possibilities inherent in nursing practice with active and passive strategies. The individual nonexpert nurse made the decision whether, and to what extent, to incorporate the possibilities into his or her practice. Those nurses that chose to include possibilities reengineered their practice through the conversion process. Their practices became more like that of the expert nurse. The nurses who chose not to reengineer their practices continued to function as nonexpert nurses. A master-apprentice relationship was the mechanism through which conversion took place.

Propositions and hypotheses.

Meleis (1985) defined propositions as tentative statements about reality and its nature which describe relationships between concepts. Intrinsic statements related to the emerging theory begin with propositions and continue to hypotheses. They are as follows:

Proposition 1. Presence is prerequisite to the acquisition of presencing.

Proposition 2. Presencing is requisite for discretionary judgment.

Proposition 3. A focus on patient response is prerequisite to the movement of clinical skills into subsidiary awareness.

Proposition 4. The movement of clinical skills into subsidiary awareness is prerequisite to the understanding of interrelationships between patient response and care and therapy.

Proposition 5. An understanding of interrelationships is prerequisite to the consideration of possibilities.

Proposition 6. The consideration of possibilities is prerequisite to the anticipation of patient response.

Proposition 7. Anticipation of patient response is prerequisite to the recognition of variable response patterns.

Proposition 8. Skilled knowledge improves the quality of patient outcomes.

Proposition 9. Skilled knowledge is learned in the practice setting from a master-apprentice relationship between an expert nurse and nonexpert nurse.

Hypothesis 1. Nonexpert nurses who develop presence will acquire the skill of presencing, as measured by the detection of subjective only and combined subjective and objective cues, when exposed full-time to a unit-based expert nurse for at least six months.

Hypothesis 2. Nonexpert nurses who develop presencing will demonstrate discretionary judgment in their decision making, as measured by hypothesis-generation and hypothesis-testing, when exposed full-time to a unit-based expert nurse for at least six months.

Hypothesis 3. Nonexpert nurses who are exposed full-time to a unit-based expert nurse for at least six months will develop a patient outcome orientation.

Hypothesis 4. Nurses who focus on patient response will demonstrate evidence of clinical skills in their subsidiary awareness, as measured by their ability to perform the skills while concentrating on something other than the skills.

Hypothesis 5. Nurses who have clinical skills in their subsidiary awareness will understand interrelationships

between patient response and care and therapy, as measured by their ability to articulate rationale for interventions for a particular patient.

Hypothesis 6. Nurses who understand interrelationships between patient response and care and therapy will consider possibilities for patient outcome, as measured by short-term and long-term goals for the patient.

Hypothesis 7. Nurses who consider possibilities for patient outcome will anticipate patient response, as measured by preparedness of human and physical resources.

Hypothesis 8. Nurses who anticipate patient response will recognize variable response patterns, as measured by the nurses' ability to articulate more than one possible response pattern to an intervention for an individual patient.

Hypothesis 9. Nonexpert nurses who are exposed full-time to a unit-based expert nurse for at least six months will demonstrate the acquisition of skilled knowledge (presence, presencing, discretionary judgment, outcome orientation, clinical skills in their subsidiary awareness, understanding of interrelationships, consideration of possibilities, anticipation of patient response, and recognition of variable response patterns).

Hypothesis 10. Nurses who demonstrate skilled knowledge will demonstrate improved quality of patient outcomes as measured by:

1. reduced use of technological monitoring and diagnostic tests
2. reduced incidence of iatrogenesis in the unit patient population
3. reduced average length of patient stay in the critical care unit
4. reduced incidence of preventable patient complications
5. increased incidence of nurse-patient covenants
6. increased incidence of rapid and appropriate physician response to nurse requests and concerns

Hypothesis 11. The development of skilled knowledge will be directly related to the amount of time a nonexpert nurse is exposed to a full-time unit-based expert nurse.

Relationship of Findings to the Conceptual Framework

The aim of grounded theory is to generate theory from the data rather than to test theory. The substantive theory of conversion was generated from these study data to explain the process whereby an expert nurse advanced the clinical

practice and decision making of nonexpert nurses in a medical critical care unit. However, as stated previously, the theoretical notions of the Octascope Nursing Model guided the focus of this study and the interpretation of the data. Although this study did not test propositions of the model, the data provided support for the Octascope Nursing Model. Further, the support that emerged from the data is strong enough to warrant a recommendation that testing of the Octascope Nursing Model be conducted.

The field notes provided preliminary support for the concept of the human entity as defined in the Octascope Nursing Model. The model defines the human entity as a unique human being who is the sum of complex, variable, changing, and integrated patterns (Rogers, 1970) within a comprehensive multidimensional realm in which changing patterns constitute the core (Goodnough, 1987). This definition conforms to the existential tenet of the unity of person and environment. Individually and collectively, the descriptions of patient and nurse interactions, and indeed noninteractions, reinforced the unity of person and environment and the notion that the patient and nurse each constitute the environmental component of the other.

The situational context of the critical care unit, in particular, supports the unity of person and environment since the patient is highly dependent on human and techno-

logical resources for biological life and the nurse, the patient, and the environment define critical care nursing (American Association of Critical-Care Nurses, 1984, 1986). The complexity, variability, change, and integration of patterns of the human entity are reflected in the data. Changing patterns and unity of person and environment are illustrated, individually and collectively, in the field notes. The reader is directed to the field note excerpt in Table 18 (pp. 174 - 176) of Mr. D. with metastasis of cancer to the pericardium as an example. This excerpt poignantly illustrated a pattern of isolation which changed to a pattern of social support. The excerpt demonstrated a palpable sense of looking through an octascope and watching complex patterns change into an integrated new form.

These study data offered compelling support for the nursing paradigm of the Octascope Nursing Model. Nursing is defined in the model as a component within the multidimensional realm of the individual that recognizes, describes, interprets, explains, mediates, and anticipates the changing patterns of a person within the context of health (Rogers, 1986; Goodnough, 1987). The nursing process contains the circular functions of presencing, interpreting, and mediating. The field notes demonstrated abundant evidence of the nursing process as described in the Octascope Nursing Model in the practices of competent and

expert critical care nurses. The functions of the nursing process specified in the model emerged as categories of the concepts of both expert and nonexpert critical care nursing practice, with presencing and interpreting reflected in the respective Gestaltic and dissociative nursing processes and with mediating reflected in the respective discretionary judgment/clinical decision making and independent/dependent practice components.

The emergence of presence in this study as a requisite for advancing nursing practice reinforces the paradigms of the human entity and nursing in the Octascope Nursing Model. Consistent absence of presence suggests that the nurse views the patient as separate and distinct from the environment. The nurse then can manipulate the environment without acknowledging that the patient is inseparably related to the environment. The integrated patterns of the human entity are not recognized, interpreted, or mediated. In contrast, the nurse with presence views the patient and environment as a single entity. The integrated patterns are recognized, interpreted, and mediated as a whole.

The findings of this study and the companion quantitative study provide support for the propositions that: (a) nurses who are skilled in pattern interpretation and mediation practice a more effective level of nursing, (b) the expert nurse can recognize and mediate the changing

patterns of both nurse and patient, and (c) the expert nurse can teach the nonexpert nurse to recognize and mediate the changing patterns of the patient. The first proposition relating skill in pattern interpretation and mediation to nursing effectiveness was supported by the individual patient outcomes described in this study and the collective patient outcomes tested in the quantitative study. The second proposition asserting expert nurse pattern interpretation and mediation was supported in this study by the descriptions of individual patient outcomes and the theory of conversion. The third proposition asserting that the expert nurse teaches the nonexpert nurse pattern recognition and mediation was supported in this study by the individual patient outcomes associated with the practices of the 69% of the sample who advanced their practice and the conversion theory.

Summary

The findings demonstrated differences between expert and nonexpert critical care nursing practice. Expert practice was characterized by a Gestaltic nursing practice and predominant independent practice component. The categories of the Gestaltic nursing process were presencing and discretionary judgment. The categories of independent practice were clinical assessment, outcome orientation,

diagnoses and orders, and collaboration. In contrast, nonexpert nursing practice was characterized by a dissociative nursing process and predominant dependent practice component. The categories of the dissociative nursing process were presence, with the subcategories of "being there" and "not being there," and clinical decision making, with the properties of referral, deferral, detachment, and inadequate knowledge. The categories of dependent practice were clinical assessment and task orientation.

Eighteen (69%) of the nonexpert nurses were observed to advance their practice over the six months of data collection. Their practices took on many of the characteristics of expert nursing practice and developed to a level characterized by an integrated nursing process and predominant interdependent practice component. Eight (31%) of the nonexpert nurses assumed new functions but their practice characteristics remained at the nonexpert level with a dissociative nursing process and predominant dependent practice component.

Conversion was conceptualized as the process by which the expert nurse advanced the practice of nonexpert nurses to improve the quality of patient outcomes. The conversion process was characterized by developing expertise, with the subcategories of credibility and redefinition of domain

boundaries, and team building, with the subcategories of flexible strategies and collaboration. The expert nurse offered a new perspective on the possibilities for nursing practice to the nonexpert nurses. The nonexpert nurses chose whether, and to what extent, to change their practices within the new perspective.

The nurses who chose to practice within the perspective of possibilities had, or developed, presence. Presence was associated with a focus on patient response and outcome and the recession of clinical skills into the nurses' subsidiary awareness. Focusing on patient response and outcome promoted the understanding of interrelationships between patient response and care and therapy. Understanding the interrelationships permitted the nurses to see patterns of response and to anticipate patient response. These nurses developed skilled knowledge. The effects of the advances in practice on patient care included prevention of complications, purposeful recovery, and humane care.

The nurses who chose not to practice within the perspective of possibilities did not develop presence. They focused on task performance and clinical skills remained in their focal awareness. They did not develop an understanding of the interrelationships between patient response and care and therapy. Consequently, these nurses were unable to see patterns of response and unable to anticipate

patient response. They did not develop skilled knowledge. Their practice remained at the nonexpert level with a dissociative nursing process and predominant dependent practice component. Patient complications were not prevented, recovery was not systematically encouraged, and the patient's human needs were not met.

The expert nurse used active and passive strategies to advance the practice of nonexpert nurses in the conversion process. Taken together, the strategies portrayed a master-apprentice relationship, in which skilled knowledge was transmitted personally from the expert nurse to the nonexpert nurse. The conditions for the master-apprentice relationship were identified as: (a) availability of the expert nurse to the nonexpert nurse, (b) willingness of the expert nurse to transmit personal knowledge to the nonexpert nurse, and (c) decision of the nonexpert nurse to adopt the expert nurse practice characteristics.

Conversion linked the data and explained the variations in the data. Factors in the process by which the expert nurse advanced the practice of nonexpert nurses were identified. The substantive theory of conversion yielded an understanding of the relationship between expert critical care nursing practice, nonexpert critical care nursing practice, and quality of patient outcomes. From this understanding, hypotheses regarding the preparation and

development of skilled critical care nurses were generated
for provisional testing.

CHAPTER V

SUMMARY OF THE STUDY

The final chapter presents a summary of the study followed by a discussion of the findings. Conclusions and implications of the study are presented and recommendations for further research are made.

Summary

Recent studies have demonstrated reduced patient mortality (Knaus, et al., 1986) and morbidity (Pyles & Stern, 1983; Goodnough, Bines, & Schneider, 1986, 1988; Smith, 1988) in critical care units where the staff nurses had access to a unit-based expert nurse. No data were available on how the expert nurse advances the practice and decision making of nonexpert nurses. Therefore, this exploratory study used the grounded theory method of constant comparative analysis to describe and explain the process by which an expert nurse advanced the practice of nonexpert nurses to improve the quality of patient outcomes in a medical critical care unit (MCCU).

The conceptual framework for the study was the Octascopic Nursing Model, in which the human entity is characterized by changing patterns. The expert nurse recognizes, mediates, and anticipates changing patterns of the patient within the dynamic health care context. Further, the expert nurse teaches nonexpert nurses to recognize, mediate, and anticipate changing patterns of the patient.

Data were collected over a six month period during a companion study, in which the presence of a unit-based expert nurse resulted in a statistically and clinically significant reduction in the incidence of preventable pulmonary complications in the study unit patient population (Goodnough, Bines, & Schneider, 1986, 1988). Data collection methods were participant observation and informal, unstructured interview. The sample consisted of 26 MCCU staff nurses and 31 MCCU patients.

The data provided a rich contrast between expert and nonexpert critical care nursing practice. The core variable of conversion emerged from this contrast to provide an explanation of the process by which the expert nurse advanced the practice of the nonexpert nurses.

A Gestaltic nursing process and independent practice were found to be the major characteristics of expert critical care nursing practice. Presencing and

discretionary judgment emerged as the properties of Gestaltic nursing process and clinical assessment, outcome orientation, diagnoses and orders, and collaboration emerged as the properties of independent practice. In contrast, nonexpert critical care nursing practice was characterized by a dissociative nursing process and a prevalent dependent practice component. Variable presence and minimal clinical decision making emerged as the major properties of the dissociated nursing process and deficient clinical assessment and task orientation emerged as the properties of dependent practice.

As the data collection progressed, 18 (69%) of the nonexpert nurses were observed to change their practice. Their practice took on the characteristics of expert nursing practice. By the end of the study, these nurses demonstrated presencing, discretionary judgment, the movement of clinical assessment skills into subsidiary awareness, an outcome orientation, understanding of interrelationships between intervention and patient response, fluid domain boundaries, patient advocacy, and collaboration. The nurses did not achieve the expert level of practice but realized an integrated nursing process and significant interdependent component to their practice. The effects of the advances in practice on patient care included

prevention of complications, purposeful recovery, and humane care.

Eight (31%) of the nonexpert nurses did not advance their practice. These nurses assumed new functions during the study but their practice remained that of the nonexpert, characterized by a dissociative nursing process and predominant dependent component. Patient complications were not prevented, patient recovery was incidental, and the patient's human needs were not met.

Conversion was conceptualized as the process by which the expert nurse advanced the practice of the majority of the sample to improve the quality of patient outcomes. The conversion process was characterized by developing nonexpert nurse expertise and team building. The expert nurse offered a new perspective on the possibilities of nursing practice to the nonexpert nurses. The individual nurses chose whether, and to what extent, to change their practices within the new perspective.

The expert nurse used active and passive strategies to promote conversion of the nonexpert nurses to a more advanced practice. In their totality, the strategies represented a master-apprentice system, in which skilled knowledge was transmitted personally from the expert nurse to the nonexpert nurse. The conditions for conversion to occur were three: (a) the availability of the expert nurse

to the nonexpert nurse, (b) the willingness of the expert nurse to transmit personal knowledge to the nonexpert nurse, and (c) the desire on the part of the nonexpert nurse to adopt the characteristics of expert critical care nursing practice.

Conversion linked the data and explained the variations in the data. The substantive theory of conversion provided an understanding of the relationship between expert and nonexpert critical care nursing practice and patient outcomes. From this understanding, hypotheses concerning the preparation of competent critical care nurses were generated for provisional testing.

Discussion of Findings

The findings of this study provided strong support for what has been implied in other studies (Benner, 1982, 1983, 1984; Pyles & Stern, 1983; Knaus, et al., 1986; Goodnough, Bines, & Schneider, 1986, 1988; Benner & Tanner, 1987; Smith, 1988; Benner & Wrubel, 1989) - that nursing practice makes a critical difference in patient outcomes. Patient care provided by critical care nurses with skilled knowledge results in early and aggressive interventions, less need for technological monitoring and diagnostic tests, prevention of patient complications, early detection and reversal of patient complications, validation and alleviation of

These findings suggest that skilled knowledge is acquired within the clinical context, by nurses with presence, with a master-apprentice approach. The three conditions of clinical context, presence, and exposure to a clinical expert facilitate the acquisition of skilled knowledge within the existential framework tenets of: (a) the person and environment as inseparable, (b) potentiation of possibilities, (c) action and knowledge as inseparable, and (d) involved participation.

With the present approach to critical care nursing education, the onus is on the individual nurse to meld the patient and environment and action and knowledge. The obstacles of the current critical care environment, reinforced by external and internal regulations and traditional culture, however, impose constraints on the nurse's ability to do so. The nurse is socialized into a culture of rules, policies and procedures, hierarchial communication systems, and generic standards of care. The nurse who envisions possibilities and is involved with the patient often converts to the expectations of the environment into which socialization occurs.

The study findings suggest that all three conditions need to exist for the acquisition of skilled knowledge. The existence of clinical context and presence did not result in skilled knowledge acquisition in the study nurses, as

evidenced by their practice characteristics at the beginning of the study. The existence of clinical context and exposure to an expert nurse did not result in skilled knowledge acquisition in 31% of the study nurses, as evidenced by their practice characteristics at the end of the study. The existence of presence and exposure to an expert nurse is more difficult to evaluate since this study was conducted only within the clinical context. However, since it is probable that the 69% of the study nurses who had presence had been exposed to an expert nurse at some point in their training, it is hypothesized that these two conditions are necessary but insufficient for skilled knowledge acquisition.

The emergence of presence as a condition of skilled knowledge in critical care nursing practice raises volatile questions. Can presence be learned or is it an inherent individual trait? Should the profession condone nursing practice devoid of presence? Recent (Pettigrew, 1988) and future research on this construct will help address the practical and ethical issues surrounding the significance of presence for clinical nursing practice.

Questions are raised by this study regarding the time of exposure of nonexpert nurses to a unit-based expert nurse. One question is how long does the nonexpert nurse need to be exposed to the expert nurse to effect practice

changes? Of the three studies demonstrating improved patient outcomes in a critical care unit with a unit-based expert nurse (Pyles & Stern, 1983; Knaus, et al., 1986; Goodnough, Bines, & Schneider, 1986, 1988), this study alone specified the length of time of exposure. It is hypothesized that longer time exposure will result in further advancement of nonexpert nurse practice. In this study, conversion was identified as the process promoting advancement and conversion was described as a developmental process. Typical developmental processes, such as parenting and mentoring, occur over a period exceeding three years (Levinson, 1978). Six months was sufficient time in this study to move 69% of the nonexpert nurses along the practice continuum to the competent level. Whether these nurses would have become proficient or expert with greater exposure to a unit-based expert nurse is unknown. It is also unknown if the other 31% of the study nurses would have developed presence with longer exposure to the expert nurse.

Another question raised by this research is whether the advancement in practice is affected by the starting level of nonexpert nurse practice. While the nonexpert nurses in this study had years of experience ranging from none to 15 years, none of the nurses were beyond the advanced beginner level using Benner's criteria (1982) at the beginning of the study. They used objective, context-free rules in their

practice and were unable to see the differential relevance of pieces of clinical data.

Benner (1982) found that nurses with two to three years of experience practiced at the competent level of the novice to expert practice continuum. There was no relationship found between years of experience and competency in this study. Almost one-third of the nonexpert nurses who advanced their practice had less than two years experience and almost one-half of the nonexpert nurses who did not advance their practice had greater than two years experience. Therefore, this study and that of Pyles and Stern (1983) did not suggest a relationship between years of experience and more advanced level of practice.

These data suggest that criteria other than years experience are needed for defining levels of career development incentive systems. The clinical ladder in the study institution equated undefined competence in clinical practice with greater than one year of nursing experience. At the end of this study, four nonexpert nurses with less than one year experience were practicing at the competent level. Five nonexpert nurses with greater than two years experience were practicing at the novice level even though they were placed higher in the career incentive system.

Benner (1983) found that expert nurses practicing in highly collaborative settings practiced with different

assumptions and expectations than expert nurses practicing in non-collaborative settings. Knaus and colleagues (1986) found a relationship between good physician and nurse collaboration and reduced patient mortality. The critical care units with good collaboration had unit-based expert nurses (Draper, 1988). Neither study operationalized collaboration nor measured the construct. A qualitative study of nurse-physician interactions (Prescott & Bowen, 1985) found very few examples of collaboration in clinical settings. The authors identified uneven nurse competence, as a result of lack of uniform preparation for nurses, as being central to poor interdisciplinary collaboration.

The MCCU was clearly a non-collaborative setting, according to the use of the term (American Association of Critical-Care Nurses, 1982; Prescott & Bowen, 1985; Prescott, Dennis, & Jacox, 1987; Baggs & Schmitt, 1988), at the beginning of this study. The expert nurse quickly established collaborative relationships with the MCCU nurses, physicians, and respiratory therapists. At the end of this study, the MCCU met the criteria for a collaborative setting (Baggs & Schmitt, 1988). If uneven nurse competence is an impediment to interdisciplinary collaboration, as suggested by Prescott and Bowen (1985), the advancement of the majority of nurses to a competent level was sufficient to promote interdisciplinary collaboration in this study.

While the construct of collaboration was not measured in the present study, the findings suggested that a unit-based expert nurse can build an interdisciplinary team in the critical care unit and create the conditions, or the atmosphere, for collaboration.

The issue of skill acquisition is raised within Maslow's hierarchy of needs (Maslow & Murphy, 1954). From the standpoint of both the patient and the nurse, the most immediate needs were to insure safety and security. Higher order needs awaited competency in the lower order needs. It is hardly appropriate to emphasize capturing the patient's readiness to learn, for example, when the patient is banging on the side rails in a desperate attempt for recognition that she can't breathe. It is also inappropriate to emphasize more complex practice skills such as collaboration when the nurse is trying to learn to recognize an occluded airway.

A distinct advantage to developing critical care nurses within the clinical setting using the master-apprentice system is the use of the situational context to imprint knowledge. In this study, the teaching strategies of the expert nurse were observed to parallel the nonexpert nurse progress with skilled knowledge acquisition. When the nonexpert nurse was acquiring skilled knowledge regarding patient safety and security needs, the expert nurse used

direct, almost authoritative, strategies such as coercion, ordering, and admonishment. The focus was predominantly on the patient and the mandate to meet the patient's physical welfare needs. Benner (1983) suggested that personal knowledge can only be transmitted by demonstration, attitudes, and reactions. Many of the expert nurse flexible strategies in this study were used to effect changes in the attitudes of nonexpert nurses. The second field note excerpt provided under flexible strategies in Appendix D (page 256) described a directive strategy designed to firmly imprint an expectation in the mind of the nonexpert nurse. In the referent excerpt, the expert nurse literally took the nonexpert nurse's hand and physically moved it through the procedure.

As the nonexpert nurse gained skilled knowledge to meet the critical care patient's basic needs, higher order developmental needs (e.g., collaboration, independent decision making, etc.) could be addressed. When the nonexpert nurse was acquiring higher order needs, the expert used more indirect, consultative teaching strategies such as suggesting, validating, and "talking aloud."

The expert nurse noticeably shifted her time and energies from the patient early in the data collection to the nonexpert nurse as data collection progressed. This shift paralleled the growth in nonexpert practice. As the

nonexpert nursing practice advanced, the expert spent more time supporting and validating nonexpert nurse practice and decision making. This shift was supported in the data by increased expert nurse presencing in relationship to nurses and decreased expert nurse presencing in relationship to patients as the study progressed. The increasingly supportive role of the expert nurse also was associated with a decreased incidence of diagnoses and orders in expert nursing practice and an increased incidence of diagnoses and orders in nonexpert nursing practice.

The current approach to the preparation and development of critical care nurses does not teach within the situational context of the critically ill patient. Presencing, discretionary judgment, clinical assessment skills, patient outcome orientation, diagnoses and orders, and collaboration need to be developed within the situational context. The situational context of critical care as the teaching milieu further permits matching teaching strategies to the needs of both patient and nurse.

The profession has fought to move nursing education into mainstream academia for the second half of the twentieth century. This is appropriate. The complex roles and responsibilities of the critical care nurse mandate an educated person with critical thinking and decision making skills. The problem is how to develop skilled knowledge so

that the nurse can apply critical thinking and decision making in the clinical practice setting. The curricular changes being considered for both undergraduate and graduate nursing education (Fitzpatrick, 1988; Styles, 1989; Moccia, 1990) are targeted toward the development of the necessary generic knowledge and skills. The findings of this study suggest that the skilled knowledge needed for competent to expert nursing practice can be developed in the clinical setting in nurses with presence who are exposed to a unit-based expert nurse.

Conclusions and Implications

The following conclusions are derived from this study.

1. Critical care nurses with skilled knowledge effect an improved quality of patient outcomes, defined as:

- prevention of complications
- purposeful recovery
- humane care

2. Critical care nurses without skilled knowledge effect poor quality of patient outcomes, defined as:

- preventable complications
- incidental recovery
- dehumanized care

3. Level of practice on the novice to expert practice continuum (Benner, 1982, 1983, 1984) is not related to academic preparation or years of practice experience.

4. Level of practice on the novice to expert practice continuum (Benner, 1982, 1983, 1984) is related to skilled knowledge (Polanyi, 1962; Benner & Tanner, 1987).

5. Skilled knowledge is acquired within the clinical context by nurses with presence, and with a master-apprentice teaching approach.

6. Presence is a prerequisite to the advancement of critical care nursing practice.

7. Conversion is a developmental process for which three conditions exist: (a) an expert nurse is available to the nonexpert nurse, (b) the expert nurse is willing to transmit personal knowledge to the nonexpert nurse, and (c) the nonexpert nurse chooses to adopt the characteristics of expert nursing practice.

The implications of these study findings are several.

1. The approach to the development of competent critical care nurses should be reconsidered. Precept and didactic teaching may be ineffective and inefficient. The cost:benefit of unit-based expert nurses may be greater than centralized education departments in the acute care hospital setting. This study found that the personal transmission of skilled knowledge from expert nurse to nonexpert nurse

converted the practice of the majority of the study critical care nurses to a practice more like that of the expert nurse. Inservice education and workshops away from the situational context of the critically ill patient have not been shown to effect changes in critical care nursing practice.

2. The academic preparation and the service setting development of critical care nurses need to be planned and evaluated collaboratively. Appropriately prepared faculty, in both academia and service, need to ensure that the characteristics of expert critical care nursing practice (Gestaltic nursing process and independent practice) are reinforced throughout the preparation and development of critical care nurses. The respective and shared responsibilities of academia and service in educating competent practitioners to provide care to critically ill patients need to be reexamined. Collaborative models need to be created that ensure the development of skilled knowledge.

3. Criteria other than years of experience are needed for advancement in career development incentive systems. The criteria need to capture the acquisition of skilled knowledge.

4. The preceptor role in critical care practice settings needs to be reevaluated. The preceptor's role

currently is to produce role conformity within the preceptee. Role conformity is task oriented and focuses on instructing the preceptee in adherence to institutional policies and procedures. Instead, the emphasis in precepting needs to be on the development of skilled knowledge in the preceptee.

5. In both academia and service, instructive interactions need to capitalize on interactions that transmit personal knowledge. Approaches other than, and including, the master-apprentice one require further evaluation.

6. Discipline specific content needs to be transmitted within situational clinical contexts. The focus needs to be on the possibilities of patient outcomes and patient responses instead of on disease specific facts and skills.

7. Flexible strategies need to be used in the preparation and development of critical care nurses. The strategy needs to be appropriate to the clinical context and to the level of practice expertise of the nurse.

Recommendations for Further Study

The following recommendations for further study are made.

1. The substantive theory of conversion be tested in different clinical settings.

2. The effects of various exposure times to a unit-based expert nurse on nonexpert nurse practice changes be tested.

3. The relationship of various exposure times to a unit-based expert nurse on nonexpert practice changes and levels of nonexpert nurse practice expertise be tested.

4. Longitudinal research on the effects of the introduction and subsequent removal of a unit-based expert nurse on the duration of practice changes of nonexpert nurses.

5. The effects of presence and exposure to an expert nurse on skilled knowledge acquisition be tested outside of the clinical context.

6. The development of instrumentation to measure presence be explored.

7. Research on the construct of presence as a prerequisite for skilled knowledge acquisition.

8. Strategies for teaching presence be tested with evaluation measures that are grounded in the clinical context.

9. Testing of the paradigms of the Octascope Nursing Model with exploratory research methods.

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APPENDIX A

Research Review Committee Exemption Form

This prospectus proposed by: Sandra K. Goodnough
_____ and entitled:

_____ Requires Human Subjects Review Committee Review
because _____

Member

APPENDIX B

Approval Letter From Graduate School

TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON
THE GRADUATE SCHOOL
P.O. Box 22479, Denton, Texas 76204 817/898-3400, 800-338-5255



January 23, 1990

Ms. Sandra Goodnough
5112 Chenevert St.
Houston, TX 77004

Dear Ms. Goodnough:

I have received and approved the Prospectus for your research project. Best wishes to you in the research and writing of your project.

Sincerely yours,

Leslie M Thompson

Leslie M. Thompson
Dean for Graduate Studies
and Research

dl

cc Dr. Carolyn Adamson
Dr. Helen Bush

APPENDIX C

Agency Approval Form

HERMANN HOSPITAL

OFFICIAL NOTIFICATION OF APPROVAL TO INITIATE RESEARCH

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RE: Clinical Advancement of Professional Practice (CAPP)

P.I.: Sandra K. Goodnough, RN, MSN

Date of C.P.H.S. Approval August 20, 1984

Approval granted by Hermann Hospital Administration.

Authorized signature: [Signature] Date: 8/28/84

Gary D. McHenry
Associate Executive Director/
Chief Operating Officer

Approval is hereby granted for the Principal Investigator to initiate the above referenced research project utilizing Hermann Hospital facilities and/or patients. By engaging in this research, the P.I. acknowledges agreement to the following:

Changes - Changes, including those required by the sponsor, which would affect human subjects, including changes in methods or procedures, numbers or kinds of human subjects, or revisions to the informed consent document or process, will not be initiated prior to approval by the Hermann Hospital Administration.

Education - The P.I. will instruct all personnel in the care of a human subject regarding possible adverse reactions that may result from the treatment modality and the appropriate corrective measures to be taken.

Records - All in-patients on any research protocol will have in their medical record a signed original and/or a copy of the informed consent document with appropriate addressograph stamping the upper right hand corner of said document.

Subsequent Review - The Hermann Hospital Administration will, on an on-going basis review all research protocols to ensure that Hermann Hospital is fulfilling its commitments to your research efforts.

Miscellaneous:



cc: Committee for the Protection of Human Subjects
Office of Chairman/Director
Principal Investigator
File

1203 Ross Sterling Avenue
Houston, Texas 77030
Phone (713) 797-4011

Affiliated with The University of Texas
Medical School at Houston

The University of Texas
Health Science Center at Houston

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The Committee for the
Protection of Human Subjects

MSMB 7.128
P.O. Box 20036
Houston, Texas 77225
(713) 792-5048

August 20, 1984

Ms. Sandra K. Goodnough, RN, MSN
Pulmonary Clinical Nurse Speciality
Department of Critical Care
Hermann Hospital

Dear Ms. Goodnough:

The Chairperson of the CPHS has reviewed your application - HSC-HH-
34-001 - "Clinical Advancement of Professional Practice (CAPP) Pilot".

With your recent memo of August 7th which clarifies and modifies the section dealing with research regarding nursing performance by survey and interview, your research/evaluation project has administrative approval to begin. It is our understanding that only retrospective use of medical records will be done and anonymity and confidentiality maintained at all times. Should you change this research design at any time in the future, please submit such change for review by this Committee.

Thank you for keeping us informed.

Sincerely yours,


Paula Knudson
Staff Assistant

cc: Lin Weeks, R.N.

APPENDIX D

Field Note Excerpts, Categories, and Constructs

Appendix D contains excerpts from the field notes, the Level II categories that were grouped according to similarities, and the Level III theoretical constructs that emerged. The field note excerpts in this appendix represent only a sample of those used to support the categories and constructs. The number of Level I (substantive) codes identified from the field notes for each category is indicated in parentheses following each category. The parenthetical number following the construct is the sum of the frequencies of substantive codes in the categories from which the construct was formed.

Field Note Excerpts, Categories, and Constructs

Field Note Excerpts	Categories	Theoretical Construct
<p>He still couldn't hear differentiation between the breath sounds, nor could the medical student or the resident who listened. I asked if Mrs. M. could have aspirated and was developing aspiration pneumonia. They [the physicians] said "No, her chest X-ray was clear." (FN 12.11)</p> <p>Two medical teams - pulmonary and medicine - came to the bedside. One team said to the other team, "This tube is in the right main stem bronchus." The other team said, "No, it's been pulled back." And I said, "No it has not been pulled back." The intern said, "Yes it's been pulled back." I asked who pulled the tube back. The intern said, "The nurse." I said "The nurse said she didn't pull the tube back." to which the intern responded "Then... well...the tube hasn't been pulled back." (FN 17.6)</p> <p>...So I said, "Let's change it." Mrs. A.'s nurse said "They're going to extubate her pretty soon so there's no point in changing the tape now. I didn't say anything... Then I thought,</p>	<p>challenging (7) confronting (10) initiating/ instigating(11) questioning/ inquiring (24)</p>	<p>challenge (52)</p>

Field Note Excerpts	Categories	Theoretical Construct
<p>"No, this is not right. We can't leave the woman with impaired venous return and facial edema because she may be extubated in the next couple of hours." So I pushed the issue that we change it now, pointing out the damage that could be done if we waited any longer. (FN 115)</p>		challenge
<p>Across the unit there was no nurse in attendance. Mrs. B., an elderly black woman with lymphoma and a short-term prognosis, was intubated, extremely agitated and restless, diaphoretic, with a heart rate in the high 180s. As I approached the bedside I could hear her vocalizing around her endotracheal tube. (FN 6.0)</p>	<p>assessing (110) identifying problems (37) problem-solving (14)</p>	<p>clinical assessment (161)</p>
<p>Today I was called to the unit by the Head Nurse for problems with Mr. S., a young man with AIDS who is in isolation. He had just been intubated for his pneumocystis pneumonia and [the nurses] were having a real problem with the endotracheal tube. So I gownned up and went into the room. There was an obvious leak in the endotracheal tube cuff. He had been intubated 20 minutes prior to the identification of the leak and the cuff had been</p>		

Field Note Excerpts	Categories	Theoretical Construct
tested prior to intubation and found intact. The first immediate priority was to ventilate Mr. S., who was not looking well at all: his blood pressure was falling, his color was bad, he was very diaphoretic and tachycardic. (FN 10.1)		clinical assessment
...I ended up talking to the patient's attending and together we established a weaning protocol which was to consist of T-tube as tolerated once a shift and then back on the ventilator at the current settings when Mrs. S.'s respiratory rate went up into the 30s. I communicated the plan to the respiratory therapist in the unit and to the nurse taking care of Mrs. S. (FN 4.5)	collaborating (23) consultation (19) helping (16) assertiveness (10) conflict resolution (8)	collaboration (76)
Later that evening the attending physician asked my opinion on when Mrs. S. could be extubated. She had been on the T-piece for two hours early in the evening and tolerated the period well, keeping her respiratory rate in the low twenties, maintained her level of consciousness, and showed no subjective or objective problems with the weaning. So I told the physician that I thought Mrs. S. could be extubated and Mrs. S. was extubated. (FN 8.7)		

Field Note Excerpts	Categories	Theoretical Construct
<p>We then spent time talking to the Chief Medical Resident, trying to elicit from him what the therapeutic end points were in terms of Mrs. T.'s hemodynamic management. After about 15 minutes we all came to the same conclusion on what the therapeutic end points were and the Chief Medical Resident volunteered to accept responsibility for conveying the information to the intern who is writing the orders for Mrs. T. (FN 34.2)</p>		collaboration
<p>So I went into action and replaced the endotracheal tube down through the larynx, assessed her, and stayed with her a while. Her diaphoresis went away, her heart rate came down, and she was breathing much easier. The medical student wanted to know what I had done and I said, "I replaced the endotracheal tube which clinically appeared to be above the larynx and she is now intubated," and went through the steps with the medical student. (FN 6.4)</p>	<p>learning (3) providing direct care (7) comfort/ confidence (12) influence (18)</p>	credibility (40)
<p>The physicians were setting up to tap her again, thinking she had pericardial tamponade. The woman was alert and responsive, was warm peripherally, looked fine, and indicated that she felt fine. So I asked the physicians to wait</p>		

Field Note Excerpts	Categories	Theoretical Construct
<p>until we could get the lines untangled and properly calibrated and organized before they made any major therapeutic decisions. I pointed out that clinically Mrs. B. looked fine and there was nothing wrong with her level of consciousness or her peripheral perfusion.</p> <p>When the lines were organized, calibrated, and new readings taken, all the data were normal. So we started weaning her off of her multiple drug therapies. (FN 104.3)</p>		credibility
<p>It was quite possible that a pneumothorax had been incurred during the Swan Ganz attempts. So I told the physician who was putting the arterial line in that if the peak inspiratory pressure went up any higher that he should stop the Swan insertion and explore pneumothorax. I told the nurse and physicians to keep their eyes on the cardiac monitor. If the bradycardia progressed, they had to abort the procedure and rule out right pneumothorax (FN 85.9).</p>	<p>diagnosing (12) ordering/ directing (36) systems problems (8)</p>	<p>diagnoses and orders (56)</p>
<p>The radiology technician was on his way back to the unit to repeat the film. I asked him why and he said, "Because the lung bases were cut off the second film." I said "It</p>		

Field Note Excerpts	Categories	Theoretical Construct
<p>doesn't matter. The last film was only done to determine a foreign object in the right upper lobe. The first film was perfect in technique and can be used for any pathological diagnosis." The technician argued that he was instructed to repeat the film. I said "Absolutely not. You go back and tell the radiologist to call me if he has a problem with this. I will take full responsibility for not doing a third X-ray on Mr. F." (FN 45.14)</p> <p>The ventilator alarms on Mr. C.'s ventilator were not working at all. The nurse had called respiratory therapy approximately one hour previous to my walking into the room. No one had come to fix the alarms. At that point, I called respiratory therapy. We had working alarms within five minutes. (FN 109.4)</p>		<p>diagnoses and orders</p>
<p>I asked her what she was going to say to the physician when she called him for an order, and her reply was "I am going to ask him for a sedation order." So I helped her work through the objective and subjective assessment findings with Mr. H. and suggested that she present these as reasons as to why she</p>	<p>supporting (16) responding (17) coaching (16)</p>	<p>empowerment (49)</p>

Field Note Excerpts	Categories	Theoretical Construct
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felt the patient needed
a sedation order.
(FN 52.5)

empowerment

I spent some time with
a staff nurse who wanted
to discuss a "run in" she
had had with one of the
residents. She wasn't
getting satisfaction from
the intern in terms of
treating Mrs. A. He did
not respond to the need
for fluids, drugs, etc.
The nurse told the
intern that she felt
something needed to be
done and she was going to
call the resident. The
intern complained to the
resident and the resident
complained to the Chief
Medical Resident who com-
plained to the Head Nurse
about the staff nurse's
actions.

We discussed the
actual words that were used
and the tone of voice. We
role played to see how she
might have communicated.
I supported her actions but
had some suggestions on her
verbal communication skills.
(FN 87.2).

Both the nurse and the resp-
iratory therapist were ob-
viously angry and in dis-
agreement with the decision
to extubate Mr. C. So we
talked to the physician
about why the patient had
been extubated. His ration-
ale was that he wanted to

Field Note Excerpts	Categories	Theoretical Construct
<p>get Mr. C. extubated as fast as possible to see if he would sink or swim. He felt there was a reasonable chance that the man would breathe easier without the resistance offered by the endotracheal tube.</p>		empowerment
<p>After the physician left, I asked the nurse and therapist if they were satisfied with the rationale, or at least understood it. They were still grumbling about it, angry, and not feeling compliant towards following the orders that had been left post-extubation. So I talked to them further and pointed out that there was really nothing wrong with the rationale as long as we kept in mind that Mr. C. had a high risk of requiring reintubation. I suggested that we have reintubation equipment readily available and that we monitor him extremely closely while giving him the benefit of every chance possible. We developed a plan of hyperinflation, deep breathing, positive pressure treatments, etc. to see if we could help keep Mr. C. extubated. (FN 36.5)</p>		
<p>...Mrs. M. was oozing this stuff from her mouth and I said to the resident, "That is guiac positive." The resident said, "No there is no blood in that." So we made a game out of it. We tested it and it was very much guiac positive. (FN 12.4)</p>	<p>flexible strategies/ innovating (14)</p>	<p>flexible strategies (14)</p>

Field Note Excerpts	Categories	Theoretical Construct
<p>The physician was getting ready to remove the invasive lines in Mr. P. The nurse assigned to the patient was no where near the bedside. I went over to her and said, "Dr. H. is taking out the invasive lines right now. You need to be there to put pressure on the line sites and to watch the cardiac monitor for arrhythmias while the Swan Ganz is being removed." The nurse just looked at me, turned around, and continued to peruse the bulletin board. I said, "Well, he's doing it right now. He's pulling the lines out right now." She continued to look at the bulletin board. I literally took her by the hand and led her to the bedside. I asked her if she knew what to do, if she knew how to put pressure on the catheter withdrawal site. She said "Yes." But she just stood there at the foot of the bed watching the physician pull the Swan Ganz through. She did not look at the monitor or wave forms and was not anywhere near ready to put pressure on the site. So I opened some sterile 4X4s, placed them in her hand, walked her over to the femoral site, held her hand up, and as soon as the catheter tip came out, plopped her hand down on the patient's groin and said, "This is how much pressure is required for five minutes and now is</p>		flexible strategies

Field Note Excerpts	Categories	Theoretical Construct
the time we apply it." (FN 58.10)		flexible strategies
<p>The nurse asked how come the unit policy was not to do sugar and acetone tests on the urine but only to follow the Diasticks. We talked about why that might be. We asked some other nurses in the unit and they didn't know either. I said I wonder if the sugar and acetone tests follow the Diasticks, whether once Mrs.R.'s glucose stabilized we could use the sugar and acetones until she spills sugar in the urine and then do Diasticks. When I turned around, the nurse had run off and come back with Clinitest equipment. She compared the tests, recorded the comparison, and announced that the results were the same. (FN 99.4)</p>		
<p>Something is going on with Mrs. B. She's either developing sepsis or some other secondary problem. I don't know what is going on, but her breathing pattern is definitively one of a patient who is tired and does not have the energy to expend on breathing.</p> <p>So I began ventilating her with a face mask and positive pressure breathing. I told the pulmonary attending and the medical team that we needed to intubate her.</p>	<p>Gestalting/ conceptual clarity (20) vigilance (8) having con- cern (11) anticipating (15)</p>	Gestalt (54)

Field Note Excerpts	Categories	Theoretical Construct
After discussion, they decided OK we should intubate her. The anesthesiologist came, intubated her, and she had a cardiac arrest. (FN 16.4)		Gestalt
<p>I went to the unit at change of shift to communicate my concerns regarding Mr. C. to the night nurse and to make sure she was comfortable with her observational assessments and blood gas interpretation. ...I told her I didn't think Mr. C. was going to be able to make it through the night without being reintubated and she said, "Why not?" I couldn't tell her exactly why I thought he would deteriorate but only that his history, blood gases and mechanical parameters at the time of extubation suggested future difficulties.</p> <p>I went down to the unit at midnight just before I went home to catch the latest "hot off the press" blood gases. The gases were actually improved. Mr. C., however, was sleeping and I asked the nurse if he was sleeping or going into a coma because of a rising carbon dioxide. She said he was sleeping and that he looked no different than he had earlier. I noted that his cardiac rhythm had changed</p>		

Field Note Excerpts	Categories	Theoretical Construct
<p>from sinus tachycardia to atrial fibrillation. He has a history of atrial fibrillation and the nurse was not concerned about this. Hypercapnia can precipitate dysrhythmias, but his blood gases are fine so I guess Mr. C. is going to do all right and I've been doing a lot of worrying these eight hours for nothing. At 4:00 AM Mr. C.'s blood gases deteriorated so he was intubated at that time and is now being mechanically ventilated (FN 43 and 44.0)</p>		Gestalt
<p>They [the physicians] asked what should be done....We discussed the patient's diagnosis and hospital course. She had had a problem with bilateral pleural effusions. She has a chest tube on the right but not on the left and the morning chest film had shown an increase in the pleural effusion on the left. So I asked about the benefit of doing a thoracentesis. The thoracentesis yielded 500 ccs of blood. After the fluid was withdrawn, the patient was able to tolerate the head-down position for the central line insertion with no respiratory distress whatsoever. (FN 9.7)</p>	<p>hypothesis-testing/ talking aloud (44)</p>	<p>hypothesis-testing (44)</p>

Field Note Excerpts	Categories	Theoretical Construct
<p>The nurse hung some blood. When I went to the bedside she was examining the blood as it was going through the drip chamber and saying, "What's wrong with this blood?" There were particles floating through it. ...We stood there together and started trouble-shooting. Checked the filter to make sure it was on appropriately, wondering if this was particulate matter that was not being filtered out. The more I looked at it, it looked like hemolysis. Looked up and the bag that had been attached, instead of saline, was dextrose in water. (FN 118.7)</p>		hypothesis-testing
<p>Went to check on Mrs. S. and found out that she had not been weaned since I left her yesterday. I asked the nurse why she hadn't been weaned and I was told that there was no order for weaning. This was my problem since I was not aware that a verbal order on the doctor's order sheet was needed to have the plan followed through. ...I wrote in the progress notes that, due to my failure to communicate the weaning plan as an order, Mrs. S. had not been weaned since yesterday morning...</p>	<p>acting independently (7) assuming responsibility (17) moving on things (6)</p>	<p>independent practice (30)</p>

Field Note Excerpts	Categories	Theoretical Construct
<p>The nurse asked me why I wrote that in the chart. I told her it was because we had not weaned Mrs. S. and the housestaff and attending were under the impression that she was being weaned as evidenced by the progress notes for the last 28 hours that referred to weaning in progress, patient doing well with weaning, etc. And that we could not let the medical team think she was being weaned when in fact she was not. Since I was the one who goofed up by not writing the order, I should take full responsibility for that. (FN 8.5)</p>		independent practice
<p>The nurse asked me to help her reverse Mrs. G.'s atelectasis. When we did a physical exam, she had diminished breath sounds in both the right middle lobe and the right lower lobe... We called in the respiratory therapist and the three of us made a plan of action to get rid of the atelectasis... The surgeons want her legs higher than her heart because of her foot problem. The medicine team wants her head elevated because she's getting continuous tube feedings. She had a very large air leak in her cuff so the first thing we did was fix the leak. We stop-</p>		

Field Note Excerpts	Categories	Theoretical Construct
<p>ped the tube feedings, checked for residual, and then left her legs elevated but left her head flat, did hyperinflation with the ventilator and with the ambu, and did percussion and suctioning. After the three of us worked with Mrs. G. for about 20 minutes, we were able to obtain secretions... and improved breath sounds.</p> <p>The therapist said she would be able to work with us just about as often as we wanted. We decided to work with Mrs. G. on an hourly basis until we got equal breath sounds. We put a time limit on 4 hours of hourly treatments and, if there was no significant improvement by then, the medical team could consider a bronchoscopy. (FN 73)</p>	<p>setting standards and expectations (12)</p> <p>mobilizing resources (10)</p> <p>change agent (5)</p> <p>supervising (5)</p> <p>admonishing (7)</p>	<p>independent practice</p>
<p>Checked on Mrs. B. She was the picture of severe respiratory distress. Her chest was barely moving, she was almost panting, ... The medical student was at the bedside. I walked over and said, "Mrs. B. is going to need to be reintubated..." Before I got the words out of my mouth, the med student called the medical team. The attending and all the housestaff came racing into the unit, out of breath. (FN 9.1)</p>		<p>redefining boundaries of the nursing domain (39)</p>

Field Note Excerpts	Categories	Theoretical Construct
<p>Approached Mrs. B.'s bedside to see how she was doing and she was semi-comatose with a shallow breathing pattern of 40 per minute. I mobilized the team into action to prepare for intubation and ventilated the woman with positive pressure and a face mask while we were waiting for anesthesia to come. (FN 16)</p>		<p>Redefinition of domain boundaries</p>
<p>As I was leaving the unit, there were two nurses on for the 3 patients. One nurse was taking a break in the lounge and the other nurse just walked into the lounge and sat down. I said, "Who's watching the three intubated patients in the unit?" There was no nurse in the unit.... only a dietitian sitting at the central desk. I conveyed that it is totally unacceptable to leave no nurse covering a critical care unit. One of the nurses went back into the unit. (FN 90.2)</p>		
<p>Mr. S.'s in-line thermometer was measuring 42 degrees centigrade at a six inch distance from his airway. I brought it to the Head Nurse's</p>		

Field Note Excerpts	Categories	Theoretical Construct
attention. Her response was, "Isn't respiratory therapy supposed to check that?" My response was "Yes, but they make their checks every one to two hours so nursing needs to monitor the thermometer and all the other ventilator parameters as well." (FN 2.5)		redefinition of domain boundaries
I've noted a conversation I heard in the nursing lounge about Mrs. B. The nurses perceived that she was extremely anxious about her lymphoma diagnosis. Mrs. B. was verbalizing her fear of dying. The nurse taking care of Mrs. B. had told her, "Well, everyone dies sooner or later", and the nurses in the lounge discussing this thought that was really an appropriate response and how well the nurse had responded to Mrs. B.'s fears of death and dying. (FN 18)	<p>presencing (39)</p> <p>interpret- ing (22)</p> <p>observing (26)</p> <p>listening (7)</p>	presencing (94)
There is a patient with asthma in the unit - a middle-aged woman. Whenever she gets severe bronchospasm, she gets quite anxious and fearful and complains of severe shortness of breath. Her heart rate goes up to the 160s-170s...This morning I spent time with the patient and the nurse,		

Field Note Excerpts	Categories	Theoretical Construct
<p>showing them the beneficial use of pursed lip breathing. I showed how sitting with the patient, talking to her, just taking three or four breaths of demonstrating and coaching pursed lip breathing could help her bring her shortness of breath and her anxiety under control. (FN 51)</p> <p>The nurse caring for G., the young girl with the brain tumor, came up to the charge nurse and asked if the parents could spend the night with G. The charge nurse and the staff discussed the pros and cons of violating the unit policy, and the differences between individual patient needs. They decided that yes G.'s parents could stay. I did not participate in the decision making. I just sat with them listening and observing. (FN 119.8)</p> <p>D. is doing a bang up job of positioning her patients. She positioned Mr. C. in the desired fashion and he coded. She felt awful and conveyed to me her frustration at trying to deliver good care and yet causing harm to the patient. (FN 120.2)</p>		<p>presencing</p>

Field Note Excerpts	Categories	Theoretical Construct
<p>Mrs. S. was intubated and on the ventilator with a decreased level of consciousness, bronchial breath sounds of the whole left lower lobe, dullness to percussion, and diffuse rhonchi throughout all lung fields. I suspected that her level of consciousness might be caused, in part, by a left lower lobe atelectasis.</p> <p>I worked with Mrs. S. for six hours using various aggressive techniques for resolving atelectasis. By the third hour of therapy her level of consciousness was much lighter and she was responding appropriately to conversation. (FN 1.2)</p> <p>Mr. F. is a young male overdose with no clinical or radiological signs of aspiration pneumonia. Anesthesia was making changes in the ventilator settings very gradually, reducing the oxygen concentration by small increments and ordering a blood gas after each change. There is a virtual shunt chart that can be used in patients with presumed normal cardiac output. Using this chart, I reduced the oxygen concentration to almost that of room air which resulted in a normal</p>	<p>decision making (44)</p>	<p>decision making (44)</p>

Field Note Excerpts	Categories	Theoretical Construct
blood gas. Mr. F. did very well, was extubated, and discharged from the unit that day. (FN 20)		probabilistic decision making
Today the Head Nurse, staff nurses, and I made clinical rounds as a concentrated, formal, focused effort. We focused on the patients' problems and prioritizing nursing actions in the short-term. We began long-term planning in the way of discharge planning and patient education. (FN 39.4)	evaluating (36) following up (18) planning (15)	outcome orientation (69)
His endotracheal tube... was not properly secured so the staff nurse and I resecured his tube together. We did have to secure the tube twice. The first time the way she looped the tape around the tube and pulled the tape around Mr. H.'s neck weren't much of an improvement over the way the tube was secured initially. (FN 33.3)		
Mrs. B.'s post code chest X-ray showed the tip of the endotracheal tube in the right main stem bronchus. I asked the staff nurse if the tube had been		

Field Note Excerpts	Categories	Theoretical Construct
pulled back and she said "No." I said, "Do you know that it is in the right main stem bronchus?" She said, "Yes." I asked who is going to pull the tube back and she said she didn't know. I assessed Mrs. B. and said, "I'll pull the tube back." She said "Do you have the authority to do that." I responded, "I am taking the authority. She is at high risk with a mainstem intubation." (FN 17.3)		outcome orientation
Two staff nurses were taping L.'s endotracheal tube. We had a lesson on the principles behind taping tubes and tried out a new way of taping that incorporates stapling a piece of tape that comes up from the neck and over the nose to relieve tension on the endotracheal tube. (FN 21.1)	teaching/ demonstrating (35) providing rationale (26)	teaching (61)
We discussed the quantitative portion of the study's pre-test results. We discussed self-extubations and talked about some things we could do to prevent them. We discussed experiences the staff had had with patients who extubated themselves and why they [the staff] thought it had happened. We went over the signs and symptoms of hypoxemia and hypercapnia and talked about the asso-		

Field Note Excerpts	Categories	Theoretical Construct
<p>ciated mentation changes in patients. We also discussed the anatomy and physiology of breath sounds... (FN 48.4)</p>		teaching
<p>The nurse called me over to help her evaluate Mr. C. for aspiration. I asked what happens when someone aspirates and what would she expect to see. She said "bronchospasm and coughing." I asked, "Did he do that?" and she said, "No, he didn't do anything. It (the emesis) just sort of came out." I said, "Did he cough at all?" and she said, "No." We tested the cuff and I showed her how to do that with the ambu and high peak inflationary pressures and there was no leak in the endotracheal tube. So I said, "It's unlikely that Mr. C. aspirated. When we bag him he has a very active cough reflex and a strong forceful cough. He has no wheezing on auscultation. There is no leak in the cuff, and if he didn't cough during the emesis, then he probably didn't aspirate." (FN 113.6)</p>		
<p>Mrs. B. is starting to have some moderate respiratory distress again. This was discussed with the nursing staff and respiratory therapists in attendance Saturday. The plan was to aggres-</p>	<p>communicating (27) building team (30) suggesting (17) developing staff professionalism (20)</p>	<p>team building (94)</p>

Field Note Excerpts	Categories	Theoretical Construct
<p>sively work on mobilizing secretions and to get her nasal cannula oxygen changed to aerosolized face mask to help liquefy her secretions. (FN 14)</p>		<p>team building</p>
<p>...The hemodynamic end-points were agreed upon by the staff, Dr. W., and myself as being optimal for Mrs. T. The intern wrote orders that did not comply with the desired end-points. The staff nurse's response to the orders was, "These are crazy!" So we communicated the end-points with the intern and the nurse on nights to make sure we were all following through on the plan agreed to previously. (FN 34.6)</p>		
<p>Mr. F., a 90 year old patient with obvious pulmonary edema, decreased level of consciousness, no urine output, hypotension, atrial fibrillation with a ventricular response rate of 42 and premature ventricular contractions, was admitted with Dr. C. in attendance. We organized an admission team of four nurses, two physicians, and one respiratory therapist. Within 25 minutes, almost continuous vital signs, a very easy intubation, blood gases,</p>		

Field Note Excerpts	Categories	Theoretical Construct
<p>venous blood work, arterial line, central venous line, Swan Ganz catheter, foley catheter, antibiotics, blood cultures, etc. had all been done on Mr. F. Between the seven of us we had Mr. F. squared away and stable within 25 minutes.</p>		<p>team building</p>
<p>One person called the shots and organized the team so that we weren't duplicating efforts. The immediate short-term plan was outlined within the first 30 seconds of arrival. We pulled the crash cart up to the bedside. I said, "Who wants to intubate?" and the pulmonary physician said he would do that. "Who wants to put an art line in?" The medicine physician said he would do that. I drew the blood work and took the vital signs. S. set up for the arterial, Swan Ganz, and central lines. K. ordered the chest X-ray and the EKG and communicated with the laboratory. The therapist got the ventilator and other respiratory equipment set up and functioning. J. was the runner for things that weren't at the bedside and communicated with Mr. F.'s family. (FN 81.0)</p>		
<p>I asked the peritoneal dialysis nurse to come over and please explain the machine and the physiology involved, what the alarms meant, and</p>		

Field Note Excerpts	Categories	Theoretical Construct
<p>what were the primary things we needed to be concerned with. I also asked her to write her beeper number for 24 hour contact on the dialysis order sheet. The MCCU staff nurse was sort of hovering around and ended up listening to the "on-the-spot" inservice, looking at the beeper number, and asking questions. By the time we were finished the staff nurse and myself felt quite comfortable taking care of Mr. C. while connected to this equipment. The staff nurse's hostility and anger were replaced by a sense of confidence and comfort....We did suggest that the peritoneal dialysis nurse should always ensure that the bedside nurse had been inserviced on the equipment. (FN 93.9)</p>		team building
<p>Mrs. M. had bronchial breath sounds in two specific spots; in the left lower lobe posteriorly and the right middle lobe. I asked the physicians if she could have aspirated and was developing aspiration pneumonia. They said, "No, her chest X-ray was clear." I went down later to look at Mrs. M.'s chest film. She had a definitive consolidated pattern in her left lower lobe behind</p>	<p>validating decision-making (10)</p>	<p>validation (10)</p>

Field Note Excerpts	Categories	Theoretical Construct
<p>the heart, although I didn't see any abnormality in the right middle lobe. However, the X-ray interpretation by the radiologist was right middle lobe and left lower lobe aspiration pneumonia. (FN 12.13)</p>		validation
<p>The Head Nurse, the clinical instructor, and I were going to do care planning and clinical rounds on Mr. C. The staff nurse said, "Well, I'd really like to take my lunch break now because he'll probably be O.K. for this next half hour and I want to be able to keep an eye on him later and stay where I can observe him. I told the staff nurse that was good thinking and planning. That it showed good organization and priority-setting on her part. (FN 38.3)</p>		
<p>The cardiac outputs were ranging from 1.0 liter to 6.5 liters per minute. The physicians were basing this patient's fluid therapy on the cardiac output measurements. The nurses told the intern that there was something wrong with the equipment and that they couldn't trust the cardiac outputs.</p>		

Field Note Excerpts	Categories	Theoretical Construct
<p>The intern said that they were fine and all he wanted was a ball park figure. But he continued to base the patient's drug therapy on the cardiac output readings. The staff called the Chief Medical Resident and he told them to stop doing cardiac outputs and agreed that it was useless, if not dangerous, to base therapy on erroneous data.</p> <p>The staff wanted support on whether they had done the right thing because the intern was really angry that they had gone above him to the Chief Medical Resident. They wanted to know if they had made the right decision. I supported their decision and reinforced the nurses' obligation to ensure valid and reliable data for decision-making.</p> <p>(FN 61.8)</p>		validation
