

COMPETENCIES NEEDED FOR THE BEGINNING LEVEL CORONARY

CRITICAL CARE NURSE : A DELPHI STUDY

by

Jessye Davis Spencer

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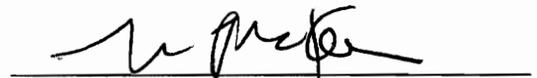
Adult and Continuing Education

APPROVED:

  
Albert Wiswell, Co-Chair

  
Marcie Boucouvalas, Co-Chair

  
Houston Conley

  
Ronald McKeen

  
Eileen Williamson

May, 1994

Blacksburg, Virginia

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Committee Co-Chair: Marcie Boucouvalas  
Committee Co-Chair: Albert Wiswell  
Education

(ABSTRACT)

Increasing complexity in critical coronary care nursing and advancements in medical technology have resulted in the need for clearly articulated competencies consistent with current practice. This need has been identified both in the literature and in practice. The problem addressed in this study was to determine what competencies, beyond basic nursing preparation, are essential for the beginning level coronary care nurse in order to provide safe nursing practice.

A three-round modified Delphi Technique was used to elicit the authority opinions of 14 experienced clinical nurse specialists currently practicing in the coronary care unit. The nurse experts identified and verified the essential cognitive and technical skills required for nurses at the beginning level of practice in coronary care units.

Nine domains and 63 competency statements were generated and refined. All were designed to be learner oriented, behaviorally described, and measurable. Implications are discussed for the design of an orientation program for beginning level coronary care nurses as well as implications for further research.

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## Chapter 1

### Introduction

The purpose of this study was to identify those clinical competencies, as perceived by clinical nurse specialists, that are needed by the beginning level coronary care nurse. Nurses attending to patients in coronary care units must be trained in the use of specialized equipment. Such specialized equipment is located in a coronary care unit of a hospital to monitor the needs of patients immediately following an acute, impending, or suspected myocardial infarction.

Coronary artery disease is the leading cause of death in industrialized countries (Sokolow & McLlroy (1990). The American Heart association (AHA) reported in 1993 that 45 percent of the 511,050 deaths from coronary heart disease (CHD) in 1988 occurred in people under age 65. The American Heart Association has projected that as many as 1,500,000 Americans will have coronary attacks in 1993 and 500,000 of that number will die. The AHA further reported that more than 300,000 people die annually from coronary heart disease before they reach a hospital.

The myocardial infarcted patient, who is critically ill, is admitted to the coronary care unit of a medical center during the acute phase. In the coronary care unit the patient's heart rate, rhythm, and conduction system are

monitored to detect arrhythmias and to determine the extent of damage to the heart muscle. The extent of damage to the heart muscle may be estimated by analyzing various cardiac enzymes in the laboratory (Burrell & Burrell, 1982). The arrhythmias are detected by electrocardiographic monitoring procedures that will focus on the area of the heart damage. Other improved specialized life-saving equipment imperative to the success of the hospital's coronary care unit required that nurses and physicians become trained in the use of such specialized equipment. Thus, the new nurse assigned to the coronary care unit is not educationally prepared to give safe care to patients already in a life-threatening situation unless she is also given specialized training. In order to make decisions regarding patient care, the new nurse must constantly observe, assess the patient's general condition, interpret the cardiac status through the use of monitors, and use the latest specialized equipment that acts as trend analyzers.

Orienting new nurses is a high priority in coronary care units because a shortage of adequately trained critical care personnel jeopardizes the ability of the hospital to provide optimal patient care. "A competency-based orientation program aimed at ensuring minimal competency in coronary care, is therefore a necessity." (Roberts, Alspach, Christopher, Kuhn, and Weincek, 1986, p. 115).

This study has relevance in the 1990's because of limited resources and the increasing complexity of critical care nursing which require the development of new strategies in teaching orientees. Karen Sechrist (1991), Director of Research for the American Association of Critical Care Nurses (AACN) stated that "research in the area of competency identification in critical care nursing is of interest to the AACN." This research is needed because the role of the critical care nurse has increased in complexity, due for the most part to many technological advances, increased patient acuity, and the intricate needs of patients currently being admitted into critical care units.

#### Statement of the Problem

The problem addressed in this study was to determine what competencies, beyond basic nursing preparation, are essential for the beginning level coronary care nurse in order to provide safe nursing care. It is essential that specific nursing activities be followed if a safe electrical environment is to be maintained in the coronary care unit.

Specific requirements to maintain a safe electrical environment include:

- (a) Televisions must be kept 5 feet 7 inches from the floor and 6 feet from the patient;
- (b) The nurse must avoid contacting metal while caring for

a patient;

- (c) Electrical equipment, such as respirators and monitors, should not touch the bed;
- (d) The nurse must avoid touching the patient simultaneously while touching electrical equipment.

A minor infraction of any of these safety-based nursing activities could cause minimal electrical current that may "potentially produce a lethal arrhythmia to the patient's heart that is called ventricular fibrillation" (Johanson, Dungca, Hoffmeister, & Wells, 1981, p. 115).

In 1980 the AACN funded a nationwide study "to determine priority areas for research in critical care nursing" (Funk, 1989, p. 135). Using a Delphi Technique, the study sought answers to the question: "What are the most significant problems or questions affecting the welfare of critically ill patients that can be solved or answered through nursing research?" Of the 15 responses, in third ranking order was the question: "What type of orientation program for critical care nurses is most effective in terms of cost, safety, and long-term care retention?" (Funk, 1989, p. 136). Cost and long-term care retention were not the foci of this study; safety, however, is a matter of concern. An incompetent nurse in the coronary care unit is a safety hazard to herself and to the patient. For example, the electrical environment is monitored by testing for

leakage of all new equipment entering into the coronary care unit, and is frequently analyzed to measure the sensitive patient area for the number of microamps present. Johanson et al. (1981) stated that the sensitive patient area must be maintained at all times with less than 100 microamps for safety purposes. Because of these safety issues and the latest developments in technetronic devices and pharmaceutical interventions, the identification of research based competencies for orientation purposes is essential for beginning level coronary care nurses.

#### Purpose

The purpose of this study was to identify those clinical competencies, as perceived by clinical nurse specialists, that are needed by the beginning level coronary critical care nurses in order that they be able to practice safely in coronary care units. The study is expected to aid in developing new strategies and reevaluating current approaches that are needed to give safe patient care.

#### Research Question

The problem addressed in this study was to identify the required knowledge and skills a nurse must have to be considered competent to practice safely at the beginning level on a coronary care unit. This study explored the perspectives of experts in coronary care nursing who are currently practicing in medical centers in several large

northeast American cities. The study was guided by the following question: What competencies beyond basic nursing preparation must the nurse at the beginning level of practice possess in order to provide the coronary critical care patient with safe nursing care?

To obtain this information, a modified Delphi Technique was used as a decision-making tool. The Delphi Technique was selected because it would be based on current knowledge and the advances in technology and the benefits of research which may not be evident in the literature review alone. Expert clinical nurse specialists, presently practicing in coronary critical care units, served as panelists and identified essential competencies currently needed by the beginning level coronary care nurse to practice safely in the coronary care unit.

#### Significance

Coronary heart disease is the leading cause of death in America today in spite of the expansion of knowledge and technology in the prevention and treatment of heart disease. The AHA (1993, p.4) reported that specialized coronary care for coronary artery disease victims can reduce in-hospital deaths by about 30 percent. The need for maintaining competency is apparent if this number of in-hospital death is to decrease. The medical facility is responsible for providing the coronary care unit with competent nurses who

are able to maintain a safe environment and give safe nursing care. The nurse administrator implements the facility's responsibility for ensuring that the coronary care nurses are competent in the use of special equipment and treatment required to prevent complications and restore health. Thus, the expansion of knowledge and the frequently improved technology in this specialty area make it imperative that research remains ongoing in the competencies essential for new nurses assigned to coronary care units.

It is anticipated that the results of this study will be useful in curriculum development for the beginning level coronary care nurse. The study highlights the value of providing orientation on the coronary care unit with specific focus on the learning experiences needed to provide optimal treatment and prevent complications.

#### Definition of Terms

The terms used in this study have been defined by the investigator as follows:

Coronary Critical Care Unit: A specifically designated area within a hospital that contains specialized equipment and is staffed to meet the anticipated needs of patients immediately following an acute, impending or suspected coronary heart attack. The unit provides continuous assessment of patients through a unique combination of direct observation and cardiac monitoring in order to

anticipate, identify, prevent, and treat patient problems as they become evident.

Beginning Level Coronary Care Nurse: A licensed registered nurse who is prepared to give direct care to patients following acute, impending, or suspected coronary heart disease. The nurse should have demonstrated successful experience for at least one year on a medical unit and may require up to three months orientation, assistance, and supervision from the critical care clinical nurse specialist.

Critical Care Clinical Cardiac Nurse Specialist: A registered nurse educationally prepared with a Master of Science degree in nursing, who has had coronary care experience and training. His/her expertise is derived from combining graduate study in nursing with specialized clinical experience. Their education represents advanced study in which the educational program featured an extensive study of nursing theories, advanced scientific concepts, research methodologies, supervised clinical practice, and other information relevant to their area of critical care specialization. This nurse acts as a liaison and consultant to the coronary critical care nurse. In some medical facilities this person may be called a clinical cardiac nurse specialist or critical care nurse instructor.

Coronary Care Nurse Practice: A dynamic process in which

the scope of practice is defined in terms of the critically ill coronary patient, the coronary care nurse, and the environment in which coronary care nursing is delivered. All three components are essential and are integral elements in the practice of coronary care nursing.

Competency Based Education: An educational system that emphasizes a learner's ability to demonstrate the proficiencies that are of utmost importance to a given task, activity or career. This system ensures that the learner can perform the tasks required in the role.

Cognitive Skill: The ability to function intellectually by utilizing one's thought processes critically and logically to devise a solution to a life threatening situation in the coronary care unit; the human capacity to integrate sensory stimuli in an environment of loud noises, alarms, and bright lights.

Technical Skill: The mechanistic ability to perform in an environment and use life saving equipment correctly.

Technetronic Device: An electronic device that communicates with other computers in a multidisciplinary manner to gather data for diagnostic decisions and pharmaceutical interventions in the care of patients.

Microshock Hazard: Electrical leakage from equipment in the patient's environment that is potentially dangerous to the patient and staff.

Orientation: A period of introduction and adjustment to a coronary care unit for the beginning practitioner in coronary care nursing.

Traditional Education: A system that emphasizes what a learner should know at the end of an educational program.

#### Assumptions

There are three basic assumptions of this study:

1. A competency based orientation program for coronary care nurses can reduce the hospitalization time and thus decrease cost of medical care for coronary care patients.
2. The role of the coronary care nurse is an essential component in the care of the coronary care patient.
3. The continuous expansion of knowledge and the frequently improved technology in this specialty area require coronary care nurses to gain and maintain updated skills to give competent care and thus reduce the number of in-hospital deaths.

#### Limitations of the Study

This study was limited to a select number of master's degree-prepared clinical nurse specialists practicing in coronary critical care units in several large, northeast American cities. This study focused on the consensus from experts in coronary critical care nursing. Therefore, it may not be immediately generalizable to another area of the

country where the technology used is not as advanced as the metropolitan areas in which the study was conducted. In rural areas where the medical center is non-research oriented or not affiliated with a medical school, the results of the study may need to be adapted to a limited practice.

### Overview of the Study

The problem is stated and explained in Chapter 1. The research question as well as the definitions, assumptions, limitations, and a brief outline of procedures are presented. Chapter 2 reviews literature found relevant to the study; the research method is discussed in Chapter 3. Chapter 4 presents and discusses the data collected in the study. The final chapter includes the summary, conclusions, and recommendations.

The pilot study description, questionnaires, and related correspondence are made available in the appendices.

## Chapter 2

### Review of the Literature

The literature review for this study focuses on the major components of: (a) historical perspective, (b) competency based education, (c) provisions for coronary care nursing education, and (d) the effects of technology on coronary care nursing practice. Much is written on competencies in nursing but little is written on competencies in coronary care, per se. This review therefore considers competencies in coronary care nursing from its inception in the early 1950's to the present time. The literature on competency based education, coronary care nursing education, and the effects of technology on coronary care nursing practice within the last ten years were reviewed to reflect the knowledge explosion, pharmaceutical interventions, and technological advances in this specialty of critical care nursing.

#### Historical Perspective

Morgan (1971) defined a coronary critical care unit as a specially designed area of the hospital, equipped and staffed to meet the anticipated needs of patients immediately following an acute or suspected coronary attack. The basic premise for such a unit was the continuous assessment of patients through a unique combination of direct observation and cardiac monitoring in order to

anticipate, identify, prevent, and treat patient problems as they became evident.

Thomas (1974) pointed out that coronary care nursing evolved in the early 1950's with the expansion of the nurse's role in the coronary care unit. She stated that the primary focus of coronary care units was to improve the quality of nursing care of patients with coronary artery disease.

Those who were involved in the development of coronary care units believed that the most essential ingredient to a successful unit was a well prepared nursing staff. Meltzer, Pinneo and Kitchell conducted a three year study in the early 1960's at Presbyterian University of Pennsylvania Medical Center on the effectiveness of coronary care units (cited in Sweetwood, 1971). They found that the mortality rates in coronary care units "vary directly with competence and training of the professional nursing staff" (Pinneo, 1991). According to Pinneo:

The study was conducted from 1963-1967, was never published, and the competencies were assessed by observing coronary care nurses while they were performing certain vital procedures in a timely manner. Some of the vital procedures were arrhythmia recognition and appropriate treatment interventions, appropriate medication

administration within a certain time frame to prevent cardiac complications, and performing certain skills in the care of patients with temporary pacemaker insertion (Telephone Interview, 1991).

Schorow (1971, p.19) maintained that "as nurses demonstrated their ability to care for critically ill coronary care patients by their skillful recognition of arrhythmia and their intervention with electrical stimulation and drugs, the physicians began to look to nurses for judgment and actions essential to the management of the patient's total metabolism." This role expanded to include observations of the total body system and making instantaneous decisions in order to intervene in life threatening situations. The coronary care nurse's practice then began to focus on anticipating and predicting possible events in a patient's clinical course. In order to perform in this manner, the nurse had to understand the patient's underlying pathology. Zochoche, then president of AACN, summarized the role of the coronary care nurse:

She is not merely the nurse who cares for the critically ill patient, but the skillful and knowledgeable nurse who functions in heroic life-saving situations. She is relied upon to render the newest technologic treatment involving

physiologic measurements, i.e., blood gas evaluation, cardiac arrhythmia control; to maintain delicate Ph and electrolyte balances and concurrent with meeting her patient's physiologic needs she manages and administers to his psychologic, social, and environmental requirements, his human needs; to extend the team concept of critical care (Zochoché, 1975, p.453).

From the above description it is apparent that the functions and responsibilities of the coronary critical care nurse (CCCN) emphasize the need for specialized knowledge in existence today; the concept that the nurse can give adequate care to any patient at any time is outdated (Alspach, 1984).

The quality of care to coronary artery disease patients improved to the extent that by 1969 the number of coronary care units had increased from 400 to 1500 (Kenny, 1989). Currently, "there are more than 1,200 coronary care units in general hospitals nationwide" (AHA, 1993, p.4 ). Specialized equipment was developed and entered into a confined area, called a coronary critical care unit, to help accommodate the physiological needs of critically ill coronary patients and to provide pertinent information regarding their conditions. The continued advancement in medical and surgical technology increased the diversity of critical care

patients and brought about the critical care subspecialties such as neonatal, neurological, surgical, pulmonary, and others. Nursing practice responded to the pathophysiological needs of the patient and to advancements in technology by designating their specialties according to the subspecialty categories of the American Medical Association.

Nurses assigned to coronary care units began by monitoring patterns of heart activities through the use of cardiac monitors. In the 1970's technologies increased to measure various systems' outputs and pressures to determine physiological functions. In addition, nurses are using machinery to assist or supplant physiological functions such as cardiac pacemakers, ventilators, intra-aortic counterpulsation balloons and more recently the technetronic device. "The technetronic device combines technology and electronics" (Devisser, 1984, p. 27). These computer devices are used to relate the information from all the data gathering equipment, "to establish a diagnosis and act as trend analyzers to further remove some of the guesswork from patient care decisions" (Devisser, 1984, p. 27).

#### Competency Based Education

Competency based education has its origin in behavioral psychology. It is a system that emphasizes a learner's ability to demonstrate the proficiencies that are of utmost importance to a given task, activity, or career. This

system ensures that the learner can perform the tasks that are required in the role. According to Elias and Merriam (1980, p. 95) "the competency based education system assures that the educational process specifies: (a) the goals and objectives to be attained in behavioral terms; (b) the learning experiences to be engaged in; (c) the method of evaluation used to demonstrate mastery of the planned goals; and, (d) outcomes and the criterion reference evaluation." It defines pertinent intellectual skills, specific required skills, and allows teachers to be more directive and non directive in their instructions. It differs from the traditional education approach that focus on outcomes of an educational program.

Alspach described competency based education in two ways: characteristics and applicability. According to Alspach :

There are eleven characteristics for designing competency based education. They are:

- (1) curriculum development, (2) experience and validation of what the real performance of competent practitioners in a role comprises,
- (3) directed at a specific role and setting,
- (4) derived through expert practitioners,
- (5) centered on performance outcomes, (6) clearly defined competency statements, (7) shared

expectations of learners, (8) flexibility in means of instruction, (9) learner centered, (10) criterion based evaluation methods, and (11) remediation recycling. (Alspach, 1984 p.665).

The design of this study encompassed each of the characteristics cited by Alspach. For characteristic (1) competency based curriculum development, the panelists cited broad competencies that are subdivided into domains which are affective, cognitive, and psychomotor and which contribute to the learner attaining a broad competency area. The minimal clinical performance outcome is delineated. Characteristics (2) and (4), experience and validation of what the real performance of competent practitioners in a role comprises, is demonstrated as follows: (a) fourteen clinical nurse specialists, currently practicing in a critical care unit, with a Master of Science degree in Nursing and a minimum of two years of experience in a critical care unit, served as panelists and identified essential competencies needed by the beginning level coronary care nurse; and (b) The clinical competencies identified are observable and measurable. Characteristics (5) through (11) are demonstrated in the current study because the panelists were given an opportunity to be creative, innovative, and to focus on technologic advances and computer assistive technology. This information was

shared with all panel members through a Modified Delphi Technique until a consensus was reached by the majority. The competency statements identified were learner centered, measurable, and observable. The beginning level coronary care nurse is permitted to practice the competency statement until a comfortable level of performance is reached. The identified competency statements are directed to a specific role (staff nurse), setting (coronary care unit) and entry level of practice. This characteristic demonstrates item (3) which states: directed at a specific role and setting.

Alspach (1984) asserted that the applicability of competency based education centers on facilitating the learner's acquisition of the competencies through attainment of required criteria of the curriculum. It is designed to contribute to the learner attaining a broad integration of knowledge and skills that are required for performance.

Mehne, Garton, and Barnes (1984) experimented with competency based curriculum design. As a result of their study, competencies were identified that students must demonstrate before graduation from their baccalaureate degree program in the school of Community Health and Physical Education. The purposes of the study by Mehne et al. (1984) were: To determine the value of developing a methodology, techniques, and standards for evaluating each competency; to determine their value in revisions of

instruction; and to assist those students who did not meet the standard.

In 1977, Del Bueno (Del Bueno & Altona, 1984) addressed the area of competency based education at a national conference of more than 1,700 nurse educators. She believed it was a strategy which had potential for influencing and changing behaviors, beliefs, and values, but cautioned that it was not to be looked upon as a panacea for all ills. Del Bueno and Altona maintained that "competency based education has been both successfully and unsuccessfully implemented in work settings, community college and university programs" (1984, p.50). In the 1984 study, Del Bueno described a two-year project involving nine Pennsylvania hospitals located within a 70-mile radius that achieved a degree of successful implementation. The project had four objectives. They were to: (a) decrease the time required for new graduate nurses to become competent on the job; (b) provide an individualized cost effective orientation program in each hospital; (c) provide an efficient orientation for nurses transferring from one hospital to another within the region; and, (d) train inservice educators in each hospital on how to use competency based education. The project had five distinct phases: (a) data collection; (b) development of competency statements; (c) development of evaluation methods and

learning options; (d) design of an individual development system; and, (e) project evaluation. The study revealed that the project's success varied in the nine hospitals. For objective (1), the time required to orient the new nurses increased by 50 percent; there was, however, a concomitant decrease in classroom activities and an increased focus on time spent learning the specifics of the job. Objective (2), to provide an individualized, cost-effective orientation for nurses transferring from one hospital to another within the region, was attained. The cost of non-clinical orientation decreased. Because of the lack of a computerized retrieval method to accomplish objective (3), the results could not be analyzed. Objective (4), to train inservice educators in each hospital how to use competency based education, was attained.

Canfield (1979) delineated 102 competencies through a panel of experts for beginning level baccalaureate critical care nurses. There were eight competencies specifically identified for coronary care nurses. Her findings revealed a significant difference in the perception of nursing educators and nursing administrators as to which clinical competencies are necessary for beginning baccalaureate level practitioners of critical care nursing.

Commenting on Canfield's study, Arlton (1981) stated that Canfield did not identify the characteristics or

qualifications of the pilot study group, neither was a statement made about the reliability of the questionnaire. In view of continuous research and expansion of knowledge and technology in the coronary care unit, a vast number of the competencies identified by Canfield are performed by nurses who are considered as generalists working on a regular medical unit; her work needs to be updated for critical care nurses and, more specifically, for coronary care nurses performing in the 1990's. For example, nurses working on a regular medical unit are monitoring central venous pressure (CVP), initiating intravenous fluids, monitoring cardiac output and other highly technical skills. The current study responds to that challenge.

Another approach, prior to the publication of Canfield's study, was taken by Freeman, McMaster, and Hamilton (1982) who designed a competency based education program for critical care nursing using Bloom's taxonomy which identified and described a hierarchy into three levels of domains: psychomotor (doing), cognitive (thinking), and affective (feeling). They used a committee consisting of head nurses from various critical care units, two educators, an administrator in nursing, an instructor, and other unidentified committee members within their hospital. The degree of experience and educational preparation were not given. The program was used for staff development and was

implemented over a period of several years. The current study is similar to Freeman et al. (1982) in that Bloom's taxonomy was used. The population and method used to identify the competencies in the current study are different from the Freeman et al. 1982 study. In view of ubiquitous changes in technology in the coronary care unit, the study by Freeman et al. needs to be updated. This study responds to that need.

Primm (1986) used a team of nursing service administrators and educators to conduct a project to define and differentiate competencies of nurses prepared with the associate degree and the baccalaureate degree in five western states. The identified competencies described the parameters of nursing practice for two levels of nursing, the associate degree and the baccalaureate of science degree. These competencies specified the minimum performance expectations for the differential practice. She suggested that differentiated competencies could be used to develop job descriptions for nursing service settings and educational curricula of both the associate and baccalaureate science programs (Primm, 1986).

In 1988, Smith and Altieri developed a clinical competence assessment tool through an assigned taskforce of head nurses and educators of critical care units. Several methods were pursued prior to the development of the

clinical competence based assessment tool (CCAT). The group decided to use an existing tool that had been tested for its validity and reliability through field testing. The tool was devised to "measure the presence of knowledge in critical care nursing and was designed by Toth and Richie in 1984" (Smith & Altieri, 1988, p. 20). Five general skill areas of basic competence required of beginning level ICU practitioners: hemodynamics, basic cardiac dysrhythmias, mechanical ventilators, 12-lead ECG's and simulated cardiac arrests were incorporated into the CCAT tool. This tool was implemented with a nursing service policy to lend credibility and legitimacy. Smith & Altieri said, "The CCAT provides an excellent mechanism for addressing factors and can easily be adapted to meet the needs of individual institutions" (1988. p. 21). The factors addressed by the CCAT tool are: individual learner's ability, the various critical care units, and the responsibilities of critical care nurse educators and head nurses to identify staff development.

The concept of competency based education was heartily endorsed by many adult education theorist such as Knowles (1980), and Elias and Merriam (1980). Knowles (1980, p.19) stated that, "competency models are replacing content transmission objectives as the basis of organizing curricula." He further stated: "It seems to be especially

relevant to a field of practice that has responsibility to help adults live in a world of accelerating change." The coronary care nurse works in an environment where there are constant changes and diverse technology. Knowles' concept supports the coronary care nurse interests and the need for an updated study. Elias and Merriam (1980) maintained that competency based education or instruction is "well suited to adult education for several reasons: (a) it allows for individual differences in terms of the starting point of instruction; (b) the time it takes a student to master competencies is flexible and independent upon individual ability; (c) learning specified competencies may be done in a variety of ways from formal class activities to life or work experiences; (d) criterion-referenced evaluation is threatening; and, (e) it is an ideal vehicle for a self-directed individual's learning experiences" (p. 95). The references used supported the writers' use of competency based education for beginning level coronary care nurses.

However, Collins (1983) expressed some concerns about competency based education. Some of his concerns were related to what he called: (a) excessive reductionism; (b) behaviorism; (c) quest for certainty; and, (d) busyness syndrome. Collins (1983) stated that "competency based models emanates [sic] from excessive reductionism" (p. 174). The reductionism to which Collins

refers is an attempt to demonstrate complex ideas by different concepts. He further explained this complex concept, competency based education, as developing a definitive list that has been predetermined to improve an individual's performance. He viewed categories, subcategories, and content areas of the competency based education program as absorbing us more into reductionism. Collins' rationale for the reductionism is that "all areas of competency cannot be defined and something will always be missing." In contrast to Collins, this writer believes that it is imperative to design competency statements in observable form and state in measurable terms the expected outcomes that the learner must demonstrate in order to be competent. He cited as an example given by James (1971, p.247) that "out of no amount of discreteness can you manufacture the concrete." It was not the intent of this investigator to define all aspects of competency based education for the beginning level coronary care nurse. This study's inquiry sought to articulate the knowledge and technical skills required of beginning level coronary care nurses in order to ensure the safety of coronary patients. The investigator understands that all parameters of this competency based model are inconceivable to define. The competency statements of this study are not a definitive solution to a specified problem but rather one in which the

learner is motivated to think and analyze specific individual problems of the coronary patient.

Competency based education has its origin in the systems of behaviorism. Collins (1983) stated that "the behaviorist frame of reference raises immense difficulties for a valid study of human endeavor in that it fails to deal adequately with intention and meaning as aspects of purposeful action" (p. 175). It is difficult to interpret the meaning of Collins' statement; however, he cited Crick (1976, p. 96) to support his evaluation of behaviorism as: "When watching a human being in the course of a social interaction, one is not witnessing a body behaving and failing to witness a mind thinking, one is seeing a person in action." The writer disagrees with Collins and Crick. This competency based model was researched by using a modified Delphi Technique to collect the data and will be used to observe the beginning level coronary care nurse in a course of social interaction with patients, where there is an exchange in communication as a person in action. The coronary care nurse communicates simultaneously with patients while thinking creatively as procedures are performed in a technical environment, such as the noise from the respirator and cardiac monitor, bright lighting, large and small electrical equipment, and a confined space in which to work in the coronary care unit, all of which may be

distracting. The nurse must be cognizant and alert while observing the patient's condition.

Collins (1983, p. 177), in his analysis of competency based education, described quest for certainty as a belief with its own motives and causes. He further stated that "the continuing quest for certainty often prematurely limits options and strategies. In an effort to precisely determine what is in store for us, we are all too readily inclined to overlook problematic alternatives which might well lead to more rational and satisfactory outcomes" (1983 p. 177). This study used experts currently practicing in coronary care units to provide the competencies for the beginning level coronary care nurse for the reasons cited by Collins. The writer recognizes that there may be problematic alternatives because one coronary care patient may not react the same way to various treatment modalities as another coronary care patient. The coronary care nurse uses data provided by electronic devices to decide which treatment is best for a specific patient based upon the prevailing preliminary data available.

Collins stated that "competency based systems are a manifestation of the continuing quest for certainty in human affairs" (1983 p. 177). He explained that competency statements serve to distract the learner from the real intent of becoming proficient. This investigator disagrees

with Collins since this was the reason for the inquiry. The competency statements of this study are flexible in order to meet the needs of the coronary patient and the coronary care nurse. Competency statements are stated in observational terms so that the learner has to use logic and be cognizant of the information provided by electronic devices relevant for each specific patient, and to be able to interpret data so as to make an informed decision which may vary from patient to patient.

Collins (1983, p. 178) described the busyness syndrome as "actually doing something regardless of the quality of its effects." His description of the busyness syndrome implies that "the intent is less purposeful and that this tends to create a tension because it is accompanied by the flurry of busy activities." The writer disagrees since this study serves to facilitate the enhancement of the coronary critical care nurse's competence; there is a method of evaluating problems within the learning situation. There is also an individual to supervise the use of the competency statements as they are being performed by the beginning level coronary care nurse.

Collins' analysis (1983, p. 181) of competency based education challenged the planner of such a concept to be cognizant of three things: (a) view of reality; (b) prescriptive methodologies; and, (c) pre-packaged

guidelines. Collins warns the supporters of competency based education to avoid overlooking problematic alternatives that may alter the outcomes, and to view each one realistically.

#### View of reality

The reality of competency based statements is standard for the normal situation, therefore allowing the coronary care nurse to think creatively and decisively in the event there are emergent crises to be managed. This creative thinking and decisiveness is based on an analysis of the prevailing preliminary data for a specific patient and situation. This study is designed as an orientation program whereby coronary care nurses at the beginning level can enhance their knowledge and skills, with the flexibility of individual differences in pacing, background, and motivation. In order to collect data, this study used the Delphi Technique which forces people to envision the future in a multifarious manner. A group of experts currently practicing in the coronary care units reached consensus which formed the basis of constructing the research-based orientation program.

#### Prescriptive methodology

Collins' (1983, p. 175) analysis of competency based education as a system viewed the model as emanating from "excessive reductionism." He refers to this as a

"definitive list of precisely determined and enumerated competencies," which is designed to enhance performance for professionals but in reality tends to distract the learner's attention from the improvement of performance. It is not the intent of this study to identify all competency statements for the beginning level coronary care nurse, only those that ensure safe patient care and provide a mechanism for the nurse to be analytical and employ critical thinking by gathering relevant data to manage a specific situation. The nurse must be cognizant of changing conditions of the patient, be able to articulate the required knowledge and technical aspects of care that ensure that life-saving measures are implemented for patients who are admitted to the hospital in a crisis. The Joint Commission for Accreditation of Hospitals Organization, a national accrediting organization, mandates that patients be assured of receiving the quality of care that they deserve.

#### Pre-packaged guidelines

Collins (1983, p.177) stated that, "In an effort to precisely determine what is in store for us, we are inclined to overlook problematic alternatives which might lead to more rational and satisfactory outcomes." This study took this into consideration by using the authority opinions of 14 experts to provide alternative information for the beginning level coronary care nurse. Users of the

competency based education model are not influenced to rely solely on the competency statement but to adapt to the actual situation. The competency statements serve as a guide for the beginning level coronary care nurse to be motivated, and place emphasis on giving safe patient care according to specific patient needs during a specific situation. The competency statements are not pre-determined for exactness but to influence creativity and empower one to think. The competency statements in this study are stated in clinical terms rather than instructional terms so that they are observable and measurable.

#### Provisions for Coronary Care Nursing Education

Since the inception of coronary care, several advanced developments have rapidly, continually, and progressively occurred: (a) improved electrocardiographic equipment, (b) expanded medical knowledge that has led to new drugs and diagnostic screening for risk factors (c) improved protocols for the control of life threatening arrhythmias, and (d) increased numbers of coronary care units. As the concept of coronary care expanded, so did the nurse's role, necessitating extended educational requirements. Weinberg (1972) said that this knowledge included electrical defibrillation, pharmacologies, diagnostic principles, and expert judgment. Spoerel (1972) stated that the use of instrumentation proliferated to include telemetry,

hemodynamic monitoring, and computers. In order for the nurse to function as an effective member of the coronary care unit team, he/she must have a comprehensive educational program. Recognizing the need for a comprehensive program in 1981, Borg, as Editor-in-Chief for the AACN, published a Core Curriculum for Critical Care Nursing. The book is divided into five sections, four of which address four major body systems, in which the cardiovascular system includes a section on myocardial infarction. More recently, to update and disseminate information regarding the latest advances for the critical care practitioner, Alspach (1991), as Editor-in-Chief for the AACN, published the Core Curriculum for Critical Care Nursing. Alspach (1991 p.1) describes the book as including in outline form latest developments in "legal and ethical concerns encountered in critical care nursing practice, addressing nursing assessments and diagnoses, and physiologic data for each problem and its management." There is a special section devoted to the management of myocardial infarction and its complications. The section is further divided into a correlation between the coronary disease locations with the clinical manifestations. This allows easy comprehension for the neophyte. Also included were sections on nursing diagnosis, nursing interventions, and the expected outcomes of each.

Del Bueno and Altona (1984), Benner, (1982) and Alspach (1984) pointed out that one system that has gained increased attention is a competency based approach to the orientation process.

To develop a competency based orientation program, the status of present coronary care education is necessary as a frame of reference. "An extensive literature search revealed a scarcity of published research in this area" (Roberts, Alspach, Christopher, Kuhn & Weincek, 1986, p.115). They state that critical care nursing education is provided in three distinct settings: private, service, and academic.

#### Private setting.

Education for critical care nurses in the private setting focuses on continuing education (Roberts et al., 1986). These programs are offered by professional organizations, vendors, businesses, and societies. The programs assist participants in fulfilling educational requirements for maintaining a desired level of competency required of institutions and to satisfy the Joint Commission of Accreditation for Hospital organizations, a national accrediting agency of medical facilities. Vendors offer continuing education with the sale of a health care product. Programs are provided in response to perceived needs of the community or agency and not necessarily the needs of an

individual coronary care nurse.

Service setting.

Registered nurses enter critical care practice with varied educational backgrounds. Usually, they have graduated from nursing schools with either a diploma, associate degree, baccalaureate or masters degree. Among these graduates, the majority have not received theory or practice in a critical care unit. Accordingly, "most generic nursing programs provide limited, if any, educational experiences in critical care" (Roberts et al., 1986, p 117). In an attempt to meet the educational needs of coronary critical care nurses, training courses are implemented in the hospital service setting under the category of staff development. Staff development includes both formal and informal learning opportunities to assist individuals in fulfilling the role expectations (Roberts et al., 1986).

Academic setting.

Roberts et al. (1986) defined the academic setting as including the National League for Nursing (NLN) approved nursing programs in universities, colleges, and hospitals that award a graduate degree, baccalaureate degree, associate degree, or diploma in nursing. The ultimate goal of each program is to educate nurses for competent practice in the medical environment. In the academic setting, the

NLN has established criteria for schools of nursing.

Roberts, et al. (1986) stated that "these criteria are broad descriptions of the expected qualification of school and faculty, but do not specify requirements for critical care nursing education in generic programs."

#### Effects of Technology on Coronary Care Nursing Practice

Sinclair (1988, p. 36) stated that, "Over the past decade an increasing number of computer dependent monitoring machines have become commonplace in the critical care unit." The impact of this equipment is to help coronary care nurses make good decisions. Computer technology is easy to use directly at the patient bedside to acquire, store, and display a comprehensive set of patient data. The data include the patient's history, physical examination, physiological variables, laboratory results, and radiographic images. The use of such technology provides the coronary critical care nurse with better access to relevant facts to assist in making decisions. Sinclair (1988) stated that while the technology provides nurses with benefits, it creates three problem areas.

#### Issues involved in the use of technology.

The three issues involved in the use of technology in the coronary care unit are: (a) constant introduction of new technology, (b) over-dependence on technology, and (c) inexperienced medical staff. Various patient injuries

have been associated with inexperienced nurses. Abramson, Wald, Grenvik, Robinson and Synder (1980) found that 25 percent of incidents in intensive care units were related to inexperienced medical staff working with technology unfamiliar to them. This study was conducted over a five year period during July and August, a season associated with an influx of new personnel: nurses, physicians and other health care professionals. To alleviate this problem, Abramson et, al., (1980, p.1582) stated: "An orientation program with a preceptor for new staff is imperative."

The second issue involving the use of technology in coronary care units is the constant introduction of new technology. Technology contributes to a continual obsolescence of nursing skills. When new technology is brought into the coronary care unit, old skills must be replaced with new skills needed to manage the updated technology. Training of all personnel was therefore needed to mitigate the risk of injury.

The third issue involving the use of technology is over dependence on technology. Frishman (1981) questioned whether nurses who become too dependent on technology and their assessment of patients will be able to function effectively in the event of equipment failure. Robin (1983) pointed out that technology's infallibility may invalidate the results and lead to incorrect decisions, and that

interpretive limitations may lead to bad decisions. There is also a danger that nurses may trust the technology readings even when the machine data conflict with their clinical assessment of the patient's status. Simpson and Brown (1985) explained that nurses must rely on experience, education, and subjectively determined probabilities in the diagnostic process. The nurse must never abandon his or her reasoning and logic. Nurses must have the knowledge, cognitive skills and confidence to overrule the computer when necessary to avoid fatal results, and the realization of full benefits of technology.

Benefits of monitoring technology.

The benefits of monitoring technology provides nurses with automatic assessment of physiological changes and an array of hemodynamic variables every two minutes so that information is processed and evaluated in caring for the critically ill coronary patient. There are monitoring systems developed to control infusion pumps administering blood products in small increments based upon computerized assessments of the patient's left atrial pressure and cardiac output. Data from the monitoring systems may be crucial to timely intervention because of sudden critical changes in the patient's status requiring nurses to make accurate decisions rapidly. "Nursing assessment and diagnosis are essentially information gathering and pattern

recognition processes and the computer can contribute efficiency, accuracy, speed and reliability to those processes" (Simpson & Brown, 1985, p.68).

### Summary

The review of the literature clearly supported the contention that a competency based orientation program for coronary care nurses grounded in current research was needed to determine competencies required for the beginning level nurse to practice in a coronary care unit. The study enhances scientific basis for coronary critical care nursing practice. It is vital that nurses possess the knowledge and skills required to perform in coronary care units when their education programs are completed. This competency based model will expand and update the core knowledge required of the beginning level coronary care nurse and to enunciate the knowledge base of coronary care nursing. Despite the criticism of Collins about competency based education, the writer was cognizant of the three points cited by him: "View of reality; prescriptive methodologies; and, pre-packaged guidelines, which all too often have been taken for granted" (Collins, 1983, p. 182). Thus, the competency based orientation education program for coronary critical care nurses was identified as the framework for anchoring this study.

## Chapter 3

### The Method

This study sought to identify those clinical competencies, as perceived by clinical nurse specialists, that are needed by the beginning level coronary care nurse. Data for this study was obtained by using a modified Delphi Technique, which was selected because advances in medical technology and benefits of medical research are more current and often invalidate information found in the literature. Thus, experts practicing in coronary critical care units were the best source of current knowledge about coronary critical care nursing.

A pilot study was completed to assess the feasibility of this study and to obtain information for improving the study (See appendix A). A three-stage Delphi Technique method was used to collect data for a competency based orientation program to be used in coronary care units for beginning level coronary care nurses. Three clinical nurse specialists each with a Master of Science degree in Nursing, having experience greater than two years in a critical care unit and currently practicing in a coronary critical care unit, participated as experts in this pilot study. The panelists were asked the following questions:

- 1) What technical skills must a nurse have to be considered competent to practice at the beginning level

on the coronary care unit?

- 2) What body of knowledge must the nurse at the beginning level of practice possess in order to provide the coronary critical care patient with safe nursing care?

The panelists generated 26 additional competencies and seven domains which served as the foundation for this study.

Results of this study are reported in Appendix A.

### The Delphi Technique

The Delphi is a technique used for systematic solicitation and collation of judgments on a particular topic (Delbecq, 1967 p. 329). The concept evolved as a forecasting tool in the early 1950's. It was utilized by the Air Force- sponsored Rand Corporation study "to obtain the most reliable consensus of opinion of a group of experts by a series of intensive questionnaires interspersed with controlled opinion feedback" (Linstone & Turnoff, 1979, p.10). The word Delphi relates to "The Delphi Oracle" (Delbecq, 1967, p.67) meaning, to forecast. Characterized as a method for structuring a group of individuals to deal with a complex problem, this technique provides feedback, assesses group views, and allows an opportunity for the individual to revise views while providing some degree of anonymity for individual responses.

Principal uses of the Delphi method in higher education as described by Judd (1972 p. 173) are: "(a) a method for studying the process of thinking about the future; (b) a

teaching tool that forces people to think about the future in a complex way; and, (c) a planning tool that may aid in probing priorities held by members and constituencies of an organization."

The Delphi Technique was used as a decision making tool in this study for obtaining consensus from a panel of experts. The consensus reached by the panelist constitutes the validation of this study and the basis of constructing the researched competency based orientation program.

#### Sample/Respondent Panel

Fifteen panelists were contacted by telephone and mailed Round One questionnaire (see appendix B). One panelist did not respond. When this researcher telephoned again to request participation, the panelist promised to return the questionnaire, however it was not received. Therefore, fourteen clinical nurse specialists with a Master of Science degree in Nursing, a minimum of two years of experience in a critical care unit and currently practicing in a coronary critical care unit in several large northeast metropolitan areas, served as panelists for this study. Their expertise was derived from combining graduate study in nursing with specialized clinical experience. Their education represented advanced study in which the educational program featured an extensive study of nursing theories, advanced scientific concepts, research methodologies, supervised clinical practice, and other

information relevant to their area of critical care specialization. The 14 panelists were identified through the local chapter of the American Association of Critical Care and by personal contact. Selection of the panelists was influenced by the size and complexity of the medical center in which they were practicing. The medical centers were university-affiliated with medical schools where the climate is conducive for research. The likelihood of maintaining a one hundred-percent return of questionnaires due to the proximity of the panelists was also considered. Delbecq (1975 p. 67) stated that few "ideas are generated within a homogenous group once the size exceeds thirty." This study used 14 panelists because it was judged that their advanced clinical and educational preparation and their currency of practice qualified them as highly desirable interested experts for the panel which concentrated on a highly focused topic.

#### Instrumentation

Reports of the most recent nursing competency studies found in the literature as of 1993 were conducted in 1979 and reported in 1982 by Arleen Canfield, and reported in 1983 by Freeman, McMaster, and Hamilton respectively. In 1979 Canfield delineated 102 specific clinical competencies through the use of "21 theoretical content areas identified for beginning level baccalaureate nursing students in critical care units." Eight of the 102 competencies

identified were directly related to coronary care, and therefore served as a foundation for this study along with seven domains and 26 competencies generated through a pilot study. The pilot study was conducted in 1990 as a preliminary for this investigation.

The instrument developed for each round was reviewed by a panel of three nurses, educationally prepared at the doctoral level, for clarity of format and directions, and to offer suggestions for improvement. Each questionnaire was refined as necessary and sent to the panelists.

#### Round One

Round One questionnaires were developed into Parts I, II, and III. Part I (see appendix B, section 1A) evaluated the usefulness of the eight competencies identified by Canfield for the beginning level baccalaureate nursing student in the coronary care units. Part II (see appendix B, section IIB) was designed to evaluate the usefulness of the seven domains and 26 competency statements identified from the pilot study (see appendix A). Part III of Round One questionnaire was a broad open-ended question which sought clear and concise statements. The panelists were asked to focus on current innovations, pharmaceutical interventions, technologic advances, computer assisted technology and additional competencies not addressed in Parts I and II of the questionnaire. They were asked to identify competencies which were beyond the basic

preparation in nursing, and to direct the competencies to a specific role (staff), setting (CCU), and level of practice (entry).

### Round Two

The responses taken from Round One were categorized into eight domains and fifty-six competency statements (see Appendix C). "Domain" refers to knowledge and competencies related to required skills of the beginning level coronary care nurse. Competency statements were designed to be learner oriented, behaviorally described, and measurable for evaluative purposes.

### Round Three

The categorized responses from Round Two were tabulated and returned to the panel to validate the refined data. On Round Three questionnaire, Round Two competency statements and domains were placed to the left of the corresponding competency statements for their perusal and review.

### Procedures

The broad question asked in this study was: "What competencies beyond basic nursing preparation must the nurse at the beginning level of practice possess in order to provide the coronary critical care patient with safe nursing care?" This question was posed to the panelists through telephone contact requesting their participation in the study and in the instructions for completing the questionnaire in Round One.

Research information in technology and rapidly changing current nursing practice in a coronary care unit provided relevant data for the practice of coronary critical care nurses. The competencies needed by the beginning level coronary critical care nurse were best assessed by the experts working daily in the units, utilizing research findings and technologies. Panelists were asked to focus on recent, current and future innovations, pharmaceutical interventions, and computer assisted technology that required attention.

Panelists were informed that their identities would remain anonymous. The broad question asked in Round One, Part III, was accompanied by a separate instruction sheet to provide structure to the responses and freedom to reflect creatively in an attempt to stimulate their thinking.

To facilitate maximum return for each Round, particular attention was given to the professional and aesthetic appeal of the questionnaires. The entire package was graduated in length by sheets with bold headings displayed on separate sheets consisting of a cover letter, title of the study, background information, procedure, instructions, Part I, II, and III, and definition of terms. Because of the inherent length of the questionnaires, the size of the type was reduced (See appendix B).

#### Data Collection

Questionnaires prepared in packets were mailed to the

14 clinical nurse specialists who served as panelists. Packets contained the title of the study, background information, the procedure, instructions, and definition of terms with a cover letters which explained the content of the packet, and an assurance of confidentiality (see Appendices B, C and D). After Round One was completed, a summary of previous rounds accompanied each packet and the panel was instructed to keep the results.

The panelists were given three weeks to respond to the questionnaire. Fourteen members of the panel responded to each of the rounds within the scheduled three weeks.

#### Data Treatment

Each response received was categorized using a frequency distribution. Following Round One Part I Canfield's competencies were reviewed by the panelists and determined to be current but in need of modification. The competencies were modified as clinical competency statements, and placed under the appropriate domain. Part II of Round One was categorized and placed under the appropriate domain. Part III of Round One responses were categorized into tentative domains and proposed competency statements. Each of the responses was used in Round Two. Responses from Round Two were changed according to suggestions of the panelists.

An asterisk was placed to the right of the competency statement indicating consensus was reached in Round One; a

double asterisk was placed beside the competency statements in which consensus was reached in Round Two. In Round Three the categorized responses were mailed to the panelists to validate the refined data using the criteria: learner oriented, behaviorally described, and measurable.

#### Summary

This chapter has reviewed the purpose of the present study and has described the research method implementing the modified Delphi Technique, the sample respondents, procedure, instrumentation, data collection, and data treatment.

## Chapter 4

### Presentation of Data

The purpose of this study was to elicit the opinions of experts on the essential competencies needed by beginning level coronary critical care nurses to practice safely in coronary care units. A three-round modified Delphi Technique was utilized to collect the data. The responses of each round are reported separately.

#### Round I Part I Responses (Canfield)

Round One, Part I addresses eight competency statements (see Table 1) identified by Canfield in 1979 to determine if they are current, need to be modified or should be deleted. The panelists decided that each competency statement identified was current, should not be deleted, but needed modification. Four of Canfield's eight competency statements were instructional, and a decision was made to make these competency statements clinically applicable so that they are observable, behaviorally described, and measurable.

Thirteen panelists stated that competency statement one did not need modifying; one panelist suggested to modify to "describe the pathophysiology of coronary heart and the subsequent signs and symptoms", but gave no rationale for the suggestion. However, for consistency, this competency statement was changed to a clinical competency statement

rather than an instructional competency statement. The changed competency is located in Round Two questionnaire under domain one competency statement P.

Thirteen panelists suggested modification for competency statement two, and one panelist stated that it did not need to be modified. Three panelists suggested modifying the competency statement to "identify types of MI with respect to cardiac location," and gave no rationale. One panelist suggested adding "expected/potential hemodynamic consequences/complications of each type." The rationale given for this response was that "specific diagnosis can alert the registered nurse to monitor specific symptoms." Other panelists suggested minor changes that were instructional rather than clinical. The competency statement was changed in favor of the majority of the panelists because their rationale was judged to be sound and it is located in Round Two questionnaire under domain one competency statement L.

The third competency statement addresses a function in that eight panelists suggested modifying and six stated that it did not need modifying. Modification was made and it was categorized in Round Two under domain three, administering and monitoring therapeutic interventions, competency statement H, Table 11. There was a range of suggestions that indicated the competency statement was difficult for a

beginning level CCU nurse. One panelist suggested changing to "identify signs and symptoms associated with each type of MI." The rationale given for this suggestion was that "the registered nurse does not interpret." One panelist suggested to change to "monitor and interpret with assistance for three months." Another panelist suggested to "monitor EKG changes, may need assistance with interpreting." Two panelists suggested to "monitor EKG changes rather than interpret." The rationale given was that "it is not the responsibility of the registered nurse to interpret at this medical center." Another panelist suggested to "identify symptoms and changes in patterns of EKG with each type of MI." The rationale given was that "the registered nurse is not responsible for interpreting."

Competency statement four was thought to need modifying by only one panelist. The panelist suggested changing the competency to "recognize major arrhythmias such as ventricular fibrillation, CHB, second degree heart block." The rationale given was that "the nurse should be able to demonstrate knowledge of drugs specific to an arrhythmia." This competency statement was similar to a competency statement identified in the pilot study. The decision was made to simplify the competency statement to make it easier for the beginning level coronary care nurse and combine it with the competency statement identified in the pilot study.

Beginners often find it difficult to learn the appropriate drug for each type of arrhythmia because pharmaceutical innovations have increased in large numbers since Canfield's study. The competency statement is categorized under domain one, diagnostic and monitoring functions, competency statement A, Table 9.

Eight panelists suggested modifying competency statement five; six stated that it did not need modifying. Two panelists suggested modifying as "recognize the signs and symptoms of MI complications." Four panelists said to "eliminate/delete "list" and change to recognize rather than discuss." The rationale given was that "it is now more clinical rather than instructional." Another panelist suggested changing to "discuss the complication of MI (CHF), cardiogenic shock, pericarditis, arrhythmias, VSO, mitral valve prolapse, aneurysm, with respect to hemodynamic changes, signs and symptoms and therapeutic interventions." The rationale given was "it is more applicable to clinical practice and more concise." Another panelist said to "add statement discuss the complications most commonly associated with all types of MI." The rationale given was "it allows the practitioner to predict and assess more specifically." The competency statement was changed in favor of the recommendation of the eight panelists suggesting modification and is located in Round Two Table 9 under

domain one, diagnostic and monitoring functions competency statement P.

Seven panelists stated that competency six did not need modifying and seven panelists said to modify. Five suggested modifying the competency statement to "identify enzymes changes associated with an MI." The rationale given was "it is one verb, clinically applicable to practice, and concise." One panelist suggested changing to "describe and interpret the major enzymes changes associated with MI." The rationale given was "it introduces isoenzymes but don't require interpretation at first." Another panelist suggested to "add major enzymes changes." The rationale given was that "there are several enzymes that do not require interpretation." A decision was made in favor of the five panelists because it was judged to be sound and rational. It is located in Round Two Table 9, domain one, diagnostic and monitoring functions, competency statement F.

Four panelists stated that competency statement seven did not need modifying and ten panelists suggested modifying. Two panelists suggested to "delete adjusted lines accordingly." The rationale given was that "it is not specific, not clear." Two panelist suggested to "add as well as adjusted vasoactive drips." The rationale given was that the nature of CCU patients demand knowledge of drug titration. The majority of patients are on IV/Ngt." One

panelist suggested to "assess for changes in CVP, urinary output, arterial pressure changes." No rationale was given for this suggestion. One panelist suggested "monitor and interpret CVP, UO, APC, SVO2, data, and adjust IV lines accordingly." The rationale given was "the SVO2 update to keep current." Four panelists suggested changing to "assess for changes in CVP, UO, and APX." The rationale given was "it is more concise and one verb is used." The competency statement was changed to include obtaining some of the essential information suggested that was not included in another competency statement. The change is noted in Round Two, Table 14, domain six, monitoring and ensuring safe nursing care, competency statement J.

Three panelists stated that competency statement eight did not need modifying and eleven suggested modifying. Four panelists suggested changing to "monitor and interpret PA catheter pressures." The rationale given was that "all must have knowledge of the normal values in order to confirm abnormal value and report to the M.D." Four panelists suggested changing to "assess PA catheter pressure waveform quality, elevated or decreased pressure value." The rationale given was "it is clearer and more applicable to clinical practice." Two panelists suggested changing to "monitor and interpret from Swan-Ganz catheters and adjust medication accordingly." The rationale given was "nurses

titrate medications based on data obtained from catheters, CO<sub>2</sub>, and SVO<sub>2</sub> added to the list." Another panelist suggested avoiding this "since other companies other than Baxter Edwards make PA catheters." This competency statement was changed in favor of the four panelists who suggested changing to "assess PA catheter pressure waveform quality, elevated or decreased pressure values." Their rationale was judged to be sound. The competency statement was categorized in Round Two under domain six, monitoring and ensuring safe nursing care, Table 14, competency statement I.

Table 1

Round 1 Part One (Canfield)

<u>Competency Statements</u>	<u>Responses</u>				
	<u>*R</u>	<u>C</u>	<u>ND</u>	<u>M</u>	<u>NM</u>
1. Describe the pathophysiology of coronary artery disease and the subsequent signs and symptoms.	14	14	0	1	13
2. List the types of MI (anterior, posterior, inferior, diaphragmatic, transmural).	14	14	14	13	1
3. Monitor and interpret electrocardiographic changes associated with each type of MI.	14	14	14	8	6
4. Recognize major arrhythmias and administer appropriate medications.	14	14	14	1	13
5. List and discuss the complications of MI (congestive heart failure, cardiogenic shock, pericarditis, arrhythmias).	14	14	14	8	6
6. Describe and interpret the enzyme changes associated with MI.	14	14	14	7	7
7. Monitor and interpret central venous pressure, urinary output, arterial pressure changes, and adjust intravenous lines accordingly.	14	14	14	10	4
8. Monitor and interpret pressures from Swan-Ganz catheters (pulmonary artery and wedge pressures).	14	14	14	11	3

\*R = Number of Respondents

C = Competency deemed current

ND = Do not delete

M = Modify

NM = No modification

Part II Domain One: Diagnostic and Monitoring Functions

Part II listed seven domains with 26 competencies generated from a pilot study conducted in 1990 as a preliminary for this study. The panelists were asked to indicate whether each listed competency statement was current, should be modified or deleted, and to provide a rationale for each decision. The first domain has five competency statements, on two of which the panelists reached consensus, and is indicated with a double asterisk(\*\*). The suggested comments are outlined in the subsequent paragraphs.

The first domain addresses diagnostic and monitoring functions (see Table 2). In general, the competency statements were changed very little. All panelists agreed that competency statements A and B reflected current practice and should not be deleted. One panelist each recommended changes in competency statements C, D, and E. One panelist indicated the word "lethal may not be clear to the learners and needed to be defined" in competency statement C. A different panelist indicated that the word "assess" in competency statement D needed to be changed to "monitor." The most substantive recommendation is that related to competency statement E. One panelist indicated that "in assessing chest pain, the nurse should be able to interpret the patient ranking of pain intensity on a one-to-

ten scale with ten reflecting the greatest intensity." Competency A is categorized in Round Two, Table 4, domain one, diagnostic and monitoring functions, competency statement D. Competency statement C was changed in favor of the panelist who stated the word "lethal" needed to be defined. The competency statement was changed to recognize all life threatening dysrhythmias in Round Two, Table 4, domain 1, diagnostic and monitoring functions, competency statement A. Competency statement D was judged to remain in favor of the majority of the panelists and is located in Round Two, Table 4, domain one, diagnostic and monitoring functions, competency statement O. Competency statement E was changed as recommended because the rationale was judged to be sound, specific, and accurate. It was changed in Round Two to assess chest pain on a one-to-ten scale factor that increases/decreases as demonstrated in ascending order and is now competency statement D, Table 4, under domain one. diagnostic and monitoring function.

Table 2

## Round 1 Part Two

## Domain 1: Diagnostic and Monitoring Functions

<u>Competency Statements</u>	<u>*R</u>	<u>Responses</u>			
		<u>C</u>	<u>ND</u>	<u>M</u>	<u>NM</u>
A. Assess physiologic changes indicative of decreased tissue perfusion.	**14	14	14	0	0
B. Recognize indications for defibrillation.	**14	14	14	0	0
C. Recognize all lethal arrhythmias.	14	14	14	1	13
D. Assess psychological signs of depression, anxiety, fear and denial.	14	14	14	1	13
E. Assess chest pain	14	14	14	1	13

**\*\* Consensus**

\*R = Number of Respondents

C = Competency deemed current

ND = Do not delete

M = Modify

NM = No modification

Domain Two: Effective Management of Rapidly Changing Situations

The second domain (see Table 3) addresses effective management of a rapidly changing situation. All competencies in this domain were modified. For competency statement A one panelist suggested that the word "safely" should be incorporated into the competency statement. No rationale was given for this suggestion. One panelist suggested restating competency statement B to "perform in extreme emergencies as demonstrated by problem identification and adherence to the ICU protocol." The rationale given was "more specific". Another panelist indicated that competency statement B should be modified by including the words "with assistance." The rationale given was that "the beginner needs help to identify a problem or implement a plan." This panelist may have thought the competency statement is an advanced skill.

Two panelists indicated that competency C should also be modified by adding "with assistance" to the competency statement, stating that beginners may have difficulties grasping this competency statement without assistance. Four panelists suggested modifying competency D with three of the four indicating that the competency statement was "too vague as written" and one panelist indicated that this competency statement was too advanced for a beginning coronary care

nurse. Since the majority of the panelists deemed competency statements A and B as current and only two panelist stated the competencies needed modifying, they remained as stated and are located in Round Two questionnaire under domain one, Table 9, diagnostic and monitoring functions, competency statements B and C. Competency statement D was deleted because it was judged to be vague, unclear, and is covered in competency statement B.

Table 3

## Round One Part Two

## Domain 2: Effective Management of Rapidly Changing Situations

<u>Competency Statements</u>	<u>*R</u>	<u>Responses</u>			
		<u>C</u>	<u>ND</u>	<u>M</u>	<u>NM</u>
A. Perform the procedure for defibrillation in an emergency.	14	14	14	1	13
B. Perform in extreme life threatening emergencies. Rapidly identifies problem and implement medical and/or nursing plan(s).	14	14	14	2	12
C. Identify and manage a patient crisis until the physician arrives.	14	13	13	2	12
D. Contingency management: Rapid matching demands and technical resources in an emergency situation.	14	10	10	4	10

\*R = Number of Respondents

C = Competency deemed current

ND = Do not delete

M = Modify

NM = No modification

Domain 3: Administering and Monitoring Therapeutic Interventions

The third domain (see Table 4) addresses administering and monitoring therapeutic interventions. The panelists agreed that competency statements A, B, C, and D were current and did not need modification. Thirteen panelists agreed with competency statement E and one panelist indicated that in many hospitals this competency statement was the responsibility of technicians rather than nurses.

Competency statements A and B were reorganized to domain six, Table 14, monitoring and ensuring safe nursing care, competency statement A and B respectively. The changed competency statement C and D is in Round Two questionnaire under domain one, Table 9, diagnostic and monitoring functions and competency statements I and E. Competency statement E is in Round Two questionnaire under domain three, Table 11, administering and monitoring therapeutic interventions, competency statement A.

Table 4

## Round One Part Two

## Domain 3: Administering and Monitoring Therapeutic Interventions

<u>Competency Statements</u>	<u>*R</u>	<u>Responses</u>			
		<u>C</u>	<u>ND</u>	<u>M</u>	<u>NM</u>
A. Meet nursing practice related to care of the patients who requires suctioning procedures.	**14	14	14	0	14
B. Implement medical plan for descriptive chest pain.	**14	14	14	0	14
C. Implement medical plan for lethal arrhythmias.	**14	14	14	0	14
D. Implement medical plan for signs indicative of decreased tissue perfusion.	**14	14	14	0	14
E. Perform the procedure for 12-lead EKG.	14	13	13	1	13

**\*\*Consensus**

\*R = Number of Respondents

C = Competency deemed current

ND = Do not delete

M = Modify

NM = No modification

Domain 4: Assistive Role

The fourth domain (see Table 5) addresses assistive roles. Panelists agreed that competency statement A is current, should not be modified or deleted. One panelist stated that competency B statement should be modified, with 13 suggesting no modification. For competency statements C and D, 13 panelists agreed that these are current and should not be deleted. Eight panelists said the competency statements did not need to be modified. One panelist suggested that competency statement C was too vague and unclear but did not offer a suggestion. One panelist suggested modifying competency statement C but did not modify or give a rationale. Another panelist said to delete competency statement C but gave no rationale, while another panelist said the competency statement was not current and did not give a rationale.

For competency statement D, six panelists said the competency statement did not need modifying, while eight panelists said the competency statement should be modified. Four panelists said to modify competency statement D to "establish mutual goals with the patient." One panelist said the competency statement should be deleted, but gave no rationale. Competency statements A, B, C, and D are currently competency statements C, F, B, and E under domain 4, assistive role, Round Two with some minor refinements.

Table 5

## Round One Part Two

## Domain 4: Assistive Role

<u>Competency Statements</u>	<u>*R</u>	<u>Responses</u>			
		<u>C</u>	<u>ND</u>	<u>M</u>	<u>NM</u>
A. Provide comfort measures.	*14	14	14	0	14
B. Maximize patient participation and enable patient to internalize the locus control.	14	14	14	1	13
C. Act as a psychologic and cultural mediator.	14	13	13	6	8
D. Utilize goals therapeutically.	14	13	13	6	8

**\*\*Consensus**

- \*R = Number of Respondents
- C = Competency deemed current
- ND = Do not delete
- M = Modify
- NM = No modification

Domain 5: Teaching Coaching Function

The fifth domain addresses teaching coaching function (see Table 6). All panelists agreed that competency statements A and B were current and should not be deleted. Consensus was reached with competency A in all responses. For competency B, 12 panelists agreed that the competency should be modified. Two panelists suggested modifying by "adding the words heart disease." The rationale given was "it is now clearer." Another panelist said to modify but gave neither modification nor reason for modifying. It is unclear why the panelists reached consensus on competency A, because it is unclear as stated and therefore was deleted in Round Two; another competency statement was substituted in its place. This restated competency statement became competency B, Table 13, in Round Two. Competency statement B became competency statement A and remained as stated in favor of the twelve panelists who stated that it did not need modification.

Table 6

## Round One Part Two

## Domain 5: Teaching Coaching Function

<u>Competency Statements</u>	<u>*R</u>	<u>Responses</u>			
		<u>C</u>	<u>ND</u>	<u>M</u>	<u>NM</u>
A. Provide an interpretation of patient's condition and give a rationale for procedure.	**14	14	14	0	14
B. Recognize patient knowledge deficit regarding conditions, procedures, equipment future impact of heart of life style and implement nursing care plan.	14	14	14	2	12

**\*\*Consensus**

\*R = Number of Respondents

C = Competency deemed current

ND = Do not delete

M = Modify

NM = No modification

Domain 6: Monitoring and Ensuring Safe Nursing Care

The Sixth domain (see Table 7) addresses monitoring and ensuring safe nursing care. The panelists agreed that competency A is current and should not be modified or deleted. For competency statement B, the panelists agreed that the competency statement is current, and should not be deleted. Thirteen panelists suggested the competency statement should not be modified. One panelist suggested modifying by adding "arterial blood gas results." The rationale given was that "there are more tests to assess for complications and this modification makes the statement clear."

The changed competency statement B became competency statement F, Table 14, in Round Two. Competency statement A became competency statement C. Some of the wording was eliminated so that it would meet the criteria and give the panelists another chance to react to it again.

Table 7

## Round One Part Two

## Domain 6: Monitoring and Ensuring Safe Nursing Care

<u>Competency Statements</u>	<u>*R</u>	<u>Responses</u>			
		<u>C</u>	<u>ND</u>	<u>M</u>	<u>NM</u>
Document the following physiological assessment data and reflect pertinent trends in the patient condition:					
A. Communicate assessment data to appropriate members of the health care team as the patient's situation warrants.	**14	14	14	0	14
B. Interpret significant related laboratory data such as cardiac enzymes, arterial blood, and CBC.	14	14	14	1	13

**\*\*Consensus**

\*R = Number of Respondents

C = Competency deemed current

ND = Do not delete

M = Modify

NM = No modification

**Domain 7: Surveillance of Mechanical Ventilation**

The Seventh domain of Round One (see Table 8) addresses surveillance of mechanical ventilation. Fourteen panelists agreed that competency statement A was current and should not be deleted or modified. Thirteen panelists agreed that competency statement B was current and should not be deleted or modified.

One panelist suggested changing the competency statement to "Identify nursing actions for malfunctioning or failure of the ventilator." Although 13 panelists said the competency statement should not be modified, a decision was made to modify in favor of the suggestion because it was reasonable and sound. Competency statement B became competency statement C in Round Two, Table 15.

Table 8

## Round One Part Two

## Domain 7: Surveillance of Mechanical Ventilation

<u>Competency Statements</u>	<u>*R</u>	<u>Responses</u>			
		<u>C</u>	<u>ND</u>	<u>M</u>	<u>NM</u>
A. Respond appropriately to sounding of specific ventilator setting alarms	**14	14	14	0	14
B. Identify the ventilator setting and mode used in a mock situation	14	14	14	1	13

**\*\*Consensus reached in Round One**

\*R = Number of Respondents

C = Competency deemed current

ND = Do not delete

M = Modify

NM = No modification

Round One Part III

Part III of Round One, a broad open-ended question, sought clear and concise statements. The panelists were asked to focus on current innovations, pharmaceutical interventions, technologic advances, computer assisted technology and additional competencies that were not addressed in Part I and II questionnaires. Panelists were instructed to identify competencies beyond the basic preparation in nursing and to direct it to a specific role (staff nurse), setting (coronary care unit), and level of practice (entry). The findings were categorized into four tentative domains (see table 9), and 19 proposed competency statements. Table 9 presents the data in numerical descending order under the number of panelists.

## Round One Part III

Table 9

TENTATIVE DOMAINS	PROPOSED COMPETENCY	NUMBER OF PANELISTS
Monitoring	1. Dysrhythmias	12
	2. Pre and Post percutaneous transluminal coronary angioplasty.	12
	3. Dysrhythmias	10
	4. SVO2	6
Comprehension	1. Intervene based upon observation of problem.	6
	2. Identify patient cardiac problem.	5
	3. Computer Assistive Technology.	6
	a. Acquiring, reporting manipulating and reacting to data.	4
	b. Data entry	4
	c. Decision tree	3
	4. Select EKG lead to optimize P-wave morphology.	4
	5. Interpret results of laboratory data.	3
6. Utilize teaching strategies with patients and families.	3	
7. Consult and collaborate with physicians.	2	
8. Infection control measures.	1	

TENTATIVE DOMAINS	PROPOSED COMPETENCY	NUMBER OF PANELISTS
	9. Recognize stress factors that affect the physiological health of the nurse. Maybe costly in terms of observation and tardiness.	1
Manipulation	1. Ability to draw arterial blood gases.	2
	2. Manage equipment	2
Evaluation	1. Assess	10
	a. Physical status of anatomical systems - such as: cardiac, pulmonary, neurological, GI, renal, integumentary.	8
	b. Proper function, adequate serious and capture of pacemaker.	8
	c. Patient's readiness and tolerance to weaning from ventilator.	4
	d. Patient response to treatment on mechanical ventilator.	3
	e. Cardiac Diagnostic - echocardiogram, stress thallium, Eps, Cardiac catheterization and nuclear imaging.	3
	f. Effective airway	2
	2. Documentation	10
	3. Calculate vasoactive and intracoronary infusion thrombolytic agents.	6
	4. Ensure an electrically safe environment.	4

## Round Two

Round Two sought an evaluation of each competency statement. The panel evaluated the competency statements according to three criteria: learner oriented, behaviorally described, and measurable. The panelists were asked to either agree or disagree with the competency statements and give the rationale for their decision.

The responses from Round Two generated eight domains and 57 competencies. In seven of the competency statements consensus was reached by the panelists and is indicated with a double asterisk (\*\*). The responses are exhibited in the subsequent tables and paragraphs.

### Domain 1: Diagnostic and Monitoring Functions

The first domain in Round Two addresses an evaluation of the diagnostic and monitoring functions of eighteen competency statements (see Table 10). The panelists agreed that competency statements A, B and C appropriately met the criteria. Thirteen panelists agreed that competency statements D, E, F, G, H, and I appropriately met the criteria. One panelist disagreed with the competency statements D, E, F, G, H, and I. In competency D the panelists disagreeing said to "substitute the phrase with one as least and ten as greatest pain intensity." The panelists' rationale was that "the wording is clearer." For clarity, competency statement D was changed as suggested by

the one panel member who disagreed. The panelist disagreeing with competency statement E suggested changing the competency statement to "implement prescribed therapies for signs indicative of decrease tissue perfusion." The panelist's rationale was that "the registered nurse follows prescribed orders or standing orders." Competency statement E was changed in favor of the panelist who disagreed because the rationale was deemed to be rational.

The panelist disagreeing with competency statement F said to "delete the word major" and gave the rationale that "enzymes changes are the same." Competency statement F was changed as suggested because the rationale was deemed to be sound. The panelist disagreeing with competency statement G suggested using the word "identify" rather than "recognize." Competency statement G remained unchanged in favor of the majority. The panelist disagreeing with competency statement H said to "use the statement assess for capillary refill." The rationale given was "there is no need to say measure in seconds because it is understood." One panelist agreed with the competency statement but asked "how often is this performed routinely?" Competency statement H was changed in favor of the panelist who disagreed because the rationale was deemed to be sound. One panelist disagreed with competency statement I and suggested inserting "prescribed therapies instead of medical plan," and gave a

rationale that "the registered nurse follows prescribed orders." Competency statement I was changed as suggested because the rationale was sound.

Twelve panelists agreed with competency statements J and K. Two panelist disagreed with competency statements J and K. For competency J one panelist suggested to "change the word analyze to assess and deleted the word basic." One panelist who disagreed with competency statement J asked the question "what is basic?" No rationale was offered for the question. Competency statement J was changed as suggested because the minor revisions made it clearer. Eleven panelists agreed that competency statements L, M, N, O met the criteria. Three panelists disagreed with competency statements L, M, N, and O. The three disagreeing with competency statement L suggested modifying as "assess for amount of jugular pressure." Their rationale was "it is concise." Competency statement L was changed as suggested because the rationale was deemed to be sound. The three panelists disagreeing with competency M suggested that it be deleted. The rationale given was that "it is covered in I above." Competency statement M was deleted as suggested because the rationale was correct.

Three panelists disagreed with competency statements N and O. For competency statement N, three panelists suggested separating this competency statement into two competency

statements such as "communicate assessment data to" and "document according to." Their rationale was "it is easier to measure." Competency statement N was changed in favor of the panelists who disagreed, because the rationale was sound. For competency statement O, one panelist said to "substitute word assess with describe." The rationale given was "the beginner may not be capable of assessing." One panelist suggested "assess for." The rationale given was "it reads better." One panelist suggested the competency statement "may be difficult for the beginning level coronary care nurse at first and therefore some assistance should be provided." Competency statement O was changed to "assess for" for clarity.

Ten panelists agreed that competency statement P met the criteria. Four panelists disagreed. One panelist suggested changing to "recognize signs and symptoms of pathophysiologic changes which occur in coronary heart disease, ie. fatigue, dyspnea, chest pain on exertion, edema, rales etc." No rationale was given for their suggestion. The other three panelists made no suggestions or rationale.

Nine panelists agreed the competency statement met the criteria. Five panelists disagreed with competency statement Q, suggesting to delete the word "thorough." The rationale given was "the word is not measurable." One

panelist suggested adding "with assistance for three to six months," indicating that this competency statement is an advanced skill for a beginner. Competency statement Q was changed in favor of the panelists who disagreed; the suggestion was valid.

Table 10

## Domain 1: Diagnostic and monitoring functions

<u>COMPETENCY STATEMENTS</u>	<u>*R</u>	<u>A</u>	<u>D</u>
**A. Recognize all life threatening dysrhythmias.	14	14	0
**B. Recognize indications for defibrillation.	14	14	0
**C. Identify types of MI with respect to cardiac location and expected/potential hemodynamics consequences/complications of each type.	14	14	0
D. Assess chest pain on a 1-10 scale factor that increases/decreases as demonstrated in ascending order.	14	13	1
E. Implement medical plan for signs indicative of decreased tissue perfusion.	14	13	1
F. Identify major cardiac enzymes and isoenzyme changes associated with M.I.	14	13	1
G. Recognize risk factors associated with: Myocardial Infarction	14	13	1
H. Assess capillary refill and measure in seconds.	14	13	1
I. Implement medical plan for life threatening dysrhythmias.	14	13	1
J. Analyze basic cardiac rhythms and assess effects upon patient.	14	12	2
K. Recognize the subsequent signs and of the pathophysiology of coronary heart disease.	14	12	2

**\*\*Consensus**

\*R = Number of Respondents

A = Agree

D = Disagree

Table 10

Domain 1: Diagnostic and monitoring functions  
[continued]

<u>COMPETENCY STATEMENTS</u>	<u>*R</u>	<u>A</u>	<u>D</u>
L. Assess for presence and degrees of increased jugular venous pressure.	14	11	3
M. Determine the hemodynamic consequences after recognizing the dysrhythmia and the patient's tolerance of the dysrhythmias.	14	11	3
N. Communicate assessment data to members of the health team and document according to policy and procedures.	14	11	3
O. Assess physiologic changes indicative of decreased tissue perfusion.	14	11	3
P. Assess psychological signs of depression, anxiety, fear and denial.	14	10	4
Q. Perform a thorough physical assessment of cardiac, pulmonary, neurologic, GI, renal systems which includes inspection, palpation and auscultation.	14	9	5

\*R = Number of Respondents

A = Agree

D = Disagree

Domain 2: Effective Management of Rapidly Changing Situations

The second domain of Round Two (see Table 11) addresses the effective management of rapidly changing situations. Eleven panelists agreed that competency statement A met the criteria. Three panelists disagreed, with one suggesting to separate as two competencies. One panelist said "it is too general and need to restate." The rationale for this decision was "not measurable." One panelist said to "delete." The rationale given was "it is stated in item H under domain 1." The decision was made to restate the competency statement by separating it into two competency statements, which enabled them to be measured.

Ten panelists agreed with competency B and C and four panelists disagreed. Three panelists said to delete the word "emergency" in competency statement B. No rationale was given for this decision. One panelist suggested rewording competency statement B because "registered nurses only perform this task in an emergency." One panelist said competency statement C is not measurable as stated. No rationale was given. Three panelists said to "delete" competency statement C, the rationale given "it is stated on page 1 item H (domain 1). The competency statement was changed in favor of the majority.

Table 11

## Round Two

## Domain 2: Effective management of rapidly changing situations

<u>COMPETENCY STATEMENTS</u>	<u>*R</u>	<u>A</u>	<u>D</u>
A. Performance in extreme life threatening emergencies as demonstrated by problem identification. Rapidly implement medical and/or nursing care plan(s) with assistance.	14	11	3
B. Perform the procedure safely for defibrillation in an emergency.	14	10	4
C. Identify and manage a patient crisis with assistance until the physician arrives.	14	10	4

\*R = Number of Respondents

A = Agree

D = Disagree

Domain 3: Administering and Monitoring Therapeutic Interventions

The third domain (see Table 12) addresses administering and monitoring therapeutic interventions in which nine competency statements were generated. Thirteen panelists agreed that competency statements A, B, and C met the criteria and one panelist disagreed in each of the above competency statements. One panelist said "nurses often do not perform competency A." The rationale for this decision was "EKG technicians perform this task." One panelist suggested to change the monitor in competency statement B. No rationale was given for this decision. One panelist suggested using "assess for" and gave a rationale as "it is clearer."

Twelve panelists agreed that competency statements D, E, F, G, and H met the criteria and two panelists disagreed. Two panelists suggested changing competency statement D by "defining competency specific to the pacemaker." The rationale for this suggestion was "what is safe competency?"

Two panelists suggested "to restate" competency E but did not restate the competency statement, but said the competency statement is "not measurable." One panelist said to add "assess for" in competency F and stated the competency statement is "now clear." One panelist said "assess for bleeding" in competency statement F and gave no

rationale for the suggestion. One panelist suggested modifying competency statement G to include R-wave because it is required. One panelist said to add "with assistance and review" because the material is covered in orientation but most new CCU nurses need to review it in the clinical area. One panelist said to "delete" competency statement H, indicating that it is not a basic competency. The panelist suggested that "this is diagnosing." One panelist suggested adding "with assistance and review," because it is covered in orientation but most new CCU nurses need to review it in the clinical area. Eleven panelists agreed that competency statement I met the criteria and three disagreed. The three panelists disagreeing said to add "nursing care priorities" as this would define what priorities." A decision was made in favor of the majority of the panelists for competency statements A, B, C, F, G, and H. Competency statement E was refined to make it measurable and observable. Competency statement D was used to formulate another domain as care of the patient with a temporary pacemaker requires a number of skills to be performed. An additional competency statement was added to the list as suggested by one panelist, who suggested modifying competency statement G to include R-wave for the monitoring lead.

Table 12

## Round Two

## Domain 3: Administering and monitoring therapeutic interventions

<u>COMPETENCY STATEMENTS</u>	<u>*R</u>	<u>A</u>	<u>D</u>
A. Perform the procedure for 12 lead EKG.	14	13	1
B. Monitor for indications contraindications in thrombolytic therapy.	14	13	1
C. Assess physiologic changes indicative of reocclusion and reinfarction.	14	13	1
D. Provide safe comprehensive nursing care to patients requiring a temporary pacemaker and following insertion.	14	12	2
E. Utilize appropriate infection control measures.	14	12	2
F. Assess physiologic changes indicative of complications following thrombolytic therapy.	14	12	2
G. Select EKG monitoring lead to optimize p-wave morphology.	14	12	2
H. Monitor electrocardiographic changes associated with each type of MI.	14	12	2
I. Revise priorities based upon changes in patient status.	14	11	3

\*R = Number of Respondents

A = Agree

D = Disagree

Domain 4: Assistive Role

The fourth domain of Round Two (see Table 13) addresses assistive role and generated six competency statements. Fourteen panelists agreed that competency statement A met the criteria. Thirteen panelists agreed that competency statements B, C, D, and E met the criteria and one panelist disagreed in each of the competency statements above. One panelist suggested that competency statement B is a skill for clergymen, clinical nurse specialists, and social workers, indicating that this is an advanced skill for a beginner. One panelist suggested modifying competency statement C and deleting competency D. The rationale given was that competency statement C is not specific, and competency D is not a competency statement alone. One panelist suggested rephrasing competency statement E. The rationale given was "it is not specific to be measurable."

Eleven panelists agreed that competency statement F met the criteria and three disagreed. One panelist suggested inserting "in participation with care and goal setting" in competency statement F. The rationale given was "makes the statement clear." One panelist said competency statement F was "not measurable as stated" and was "not sure what behavior would illustrate this." One panelist suggested to modify competency statement F stating "the beginner is incapable of allowing patient/family to be in their care."

Competency statements A, B, C, D, and F remained as competency statements under domain 5 of Round Three with some refinement to make them measurable. Competency statement D was eliminated because it is covered in competency statements E and F.

Table 13

## Domain 4: Assistive Role

<u>COMPETENCY STATEMENTS</u>	<u>*R</u>	<u>A</u>	<u>D</u>
**A. Utilize other administrative services to support patient care.	14	14	0
B. Provide time for family members to express their feelings and concerns relating to patient illness.	14	13	1
C. Provide comfort measures.	14	13	1
D. Include client in planning his/her care.	14	13	1
E. Establish mutual goals with patient to enhance recover.	14	13	1
F. Allow patient/family participation and enable patient to internalize the locus of control.	14	11	3

## \*\*Consensus

\*R = Number of Respondents

A = Agree

D = Disagree

Domain 5: Teaching Coaching Functions

The fifth domain of Round Two (see Table 14) addresses teaching, coaching functions and generated two competency statements. Twelve panelists agreed that competency statements A and B met the criteria while two disagreed. One panelist suggested to change "recognize" in competency statement A to "assess for." The rationale given "this will make it measurable." The other panelist suggested deleting "future impact of heart disease on life style" in competency statement A, and gave no rationale. One panelist stated "one to one pamphlets, video classes" in competency B. The rationale given was "this would delineate strategies for the beginner." One panelist suggested to modify competency statement B but did not restate the competency statement. The rationale given was that "teaching strategies need to be preplanned."

Table 14

## Round Two

## Domain 5: Teaching Coaching Functions

<u>COMPETENCY STATEMENTS</u>	<u>*R</u>	<u>A</u>	<u>D</u>
A. Recognize patient knowledge deficit regarding condition, procedures, equipment, future impact of heart disease on life style and implement nursing care plan.	14	12	2
B. Utilize various teaching strategies with patient and family.	14	12	2

\*R = Number of Respondents

A = Agree

D = Disagree

Domain 6: Monitoring and Ensuring Safe Nursing Care

The sixth domain of Round Two (see Table 15) addresses monitoring and ensuring safe nursing care and generated ten competency statements. Thirteen panelists agreed that competency statements A, B, C, and D met the criteria and one disagreed in each of the above competency statements. One panelist suggested to change competency statement A to "implement therapeutic procedures for descriptive chest pain as per standing order." The rationale given for this suggestion was that the competency statement "was not measurable." One panelist suggested changing competency statement B to "perform airway suctioning as per standards of care and procedures," indicating that this would make the competency statement "measurable." One panelist suggested to insert "health care prior to team" in competency statement C, indicating this "makes the competency statement clearer." One panelist suggested "techniques" in competency statement D, to make "it read better."

Twelve panelists agreed that competency statements E, F, G, H, and I met the criteria and two disagreed in each of the above competency statements. One panelist said to "delete with assistance and change pressure wave form to RA, RV, PA, PCWP, arterial pressure arterial pressure wave forms" in competency statement E. The rationale given, it

is "now measurable." One panelist suggested changing to "assess PA, CVP, and arterial pressure wave forms as to catheter location." The rationale given it is now "clearer and measurable."

One panelist suggested to "separate competency statement F into two competency statements." The rationale given was "two verbs are used." One panelist said competency statement F needs to be specific, i.e. vital signs, lung sounds, heart rhythm, urinary output, chest pain." The rationale given was it is "now measurable."

One panelist suggested changing competency statement G to "perform procedures specific to bedside equipment on patient attachment, equipment, set up, patient monitoring and equipment troubleshooting." The rationale given was "clearer." One panelist stated change "baseline ability to correctly operate bedside equipment." The rationale given for the change was that it is "now measurable."

One panelist suggested changing competency statement H to "recognize hazards to patient safety." The rationale given was "clearer." One panelist said to "delete and to give the patient a feeling of being safe." The rationale given was "now measurable."

One panelist stated to change competency statement I to "assess PA wave form, compare values with previous to determine need for troubleshooting system for accuracy."

The rationale given was "quality of wave form is often used to determine need for troubleshoot." One panelist said to "delete as now covered in E."

Ten panelists agreed with competency statement J and four disagreed. One panelist suggested to change to "titrate vasoactive and inotropic infusion as to changes in arterial pressure and SVO2 values." The rationale given was "clearer." One panelist said to substitute CVP changes with RA, PA, PCVP, cardiac output/index, SVO2." The rationale given was "these data are all used to adjust vasoactive drips." Two panelists said "fine as written but competency statement is for a critical care nurse with more experience."

Table 15

## Domain 6: Monitoring and Ensuring Safe Nursing Care

<u>COMPETENCY STATEMENTS</u>	<u>*R</u>	<u>A</u>	<u>D</u>
A. Implement medical plan for descriptive chest pain.	14	13	1
B. Meet nursing practice standards related to take care of the patient who requires suctioning procedures.	14	13	1
C. Communicate assessment data to members of the team.	14	13	1
D. Perform hemodynamic monitoring techniques according to hospital policy and procedure.	14	13	1
E. Correctly identify pressure wave forms with assistance.	14	12	2
F. Interpret and document the physiological assessment data that reflect pertinent trends in the patient condition.	14	12	2
G. Demonstrate baseline ability to manage bedside equipment utilized for patients.	14	12	2
H. Recognize hazards to patients safety and takes appropriate action to maintain a safe environment and to give patient feeling of being safe.	14	12	2
I. Assess PA catheter pressure wave form quality to determine elevated or decreased pressure values.	14	12	2
J. Monitor and interpret central venous pressure changes, SVO2 data and adjust vaso-active drips accordingly.	14	10	4

\*R = Number of Respondents

A = Agree

D = Disagree

Domain 7: Surveillance of Mechanical Ventilation

The seventh domain of Round Two (see Table 16) addresses surveillance of mechanical ventilation and generated four competency statements. Fourteen panelists agreed that competency statements A and B met the criteria. Thirteen panelists agreed that competency statement C met the criteria and one panelist disagreed.

One panelist stated to change competency statement C into two competency statements such as "identify malfunctioning or failure of ventilator." "Take action to ensure patient ventilates, when ventilator failure occurs." The rationale given was "two competency statements into one."

Twelve panelists agreed that competency statement D met the criteria and two disagreed. One panelist said to change competency statement D to "assess patient response to ventilator modes and respiratory rate during weaning specific to work of breathing and SVO values." The rationale given was "it is now measurable." One panelist suggested to "keep statement and add with assistance for five to six months." The rationale given was "this material is covered in orientation but requires clinical exposure to fine tune it." The suggestions offered by the minority were deemed to be sound and changes were made accordingly for Round Three.

Table 16

## Domain 7: Surveillance of Mechanical Ventilation

<u>COMPETENCY STATEMENTS</u>	<u>*R</u>	<u>A</u>	<u>D</u>
**A. Identify methods of weaning and nursing observation indicative of successful/ unsuccessful weaning.	14	14	0
**B. Respond appropriate to sounding of specific ventilator setting alarms.	14	14	0
C. Identify nursing actions for malfunctioning or failure of the ventilator.	14	13	1
D. Assess tolerance to modes and identify readiness to wean.	14	12	2

**\*\*Consensus**

\*R = Number of Respondents

A = Agree

D = Disagree

Domain 8: Managing Computerized Data

The eighth domain of Round Two (see Table 17) addresses managing computerized data and generated five competency statements. Thirteen panelists agreed that competency statements A, B, C, and D met the criteria and one panelist disagreed with each of the above competency statements.

One panelist said to combine competency statements A and to "access hemodynamic data related to cardiac output, preload, afterload and contractility." The rationale given "now measurable." One panelist agreed with competency statement B but stated "I have some difficulty with this statement but would keep as is." The rationale given was "physiologic shunts, to me are more sophisticated concept." One panelist said to "delete competency statement C." The rationale given was "it assumes computer assessment aids are available."

One panelist suggested to change competency D to "document validated computerized information relative to cardiovascular status as per unit policy." No rationale was given for this decision. Twelve panelists agreed that competency statement E met the criteria and two panelists disagreed. One panelist said to "delete competency statement E, with the rationale given as "not measurable." One panelist said "it is covered in 8B above." A decision was made to accept the suggestion of one panelist and refine

competency statements A and B so that it is measurable. Competency statement E was deleted as suggested by a panelist because it was covered in 8B.

Table 17

## Domain 8: Managing Computerized Data

<u>COMPETENCY STATEMENTS</u>	<u>*R</u>	<u>A</u>	<u>D</u>
A. Access continuous monitored cardiovascular parameters to determine nursing priorities.	14	13	1
B. Access the information relative to the diagnosis and therapeutic regime such as drug doses, physiologic shunt, indices etc. to make appropriate decision(s).	14	13	1
C. Access computer decision aids to initiate appropriate therapeutic regime.	14	13	1
D. Document pertinent information relevant to the patient's condition to promote data integration and consistency.	14	13	1
E. Identify the data needed for clinical practice.	14	12	2

\*R = Number of Respondents

A = Agree

D = Disagree

### Round Three

Round Three sought the panel members' approval and validation of the domains and competency statements. They were asked to confirm the competency statements or react to those with which they disagreed. For those competencies in which the panel disagreed they were asked to rewrite the competency statement and give their rationale for the change. The competency statements from Round Two were placed to the left of Round Three competency statements. The panelists were requested to validate if the competency statement was learner oriented, behavioral described, and measurable.

In Round Two under Domain 3, competency statement D, two panelists suggested defining competency statements specific to the pacemaker. Another Domain was formulated as care of the patient with a temporary pacemaker (see page 86) as there are a number of skills required to be performed. The panelists' suggestion was deemed to be sound. Therefore, Round Three had 9 domains, 63 competency statements. In 33 of the 63 competency statements, consensus was reached by the panel. The competency statements in which the panel reached consensus are indicated by three asterisks (\*\*\*) (see Appendix E). The results of Round Three are exhibited in the following paragraphs.

Domain 1: Diagnostic and Monitoring Functions

## Competency Statements

\*\*\*A. Assess chest pain on a 1-10 scale with one as least and 10 as greatest pain intensity. 14 of the panelists agreed with the competency statement.

B. Perform a physical assessment of cardiac, pulmonary, neurologic, G.I., renal system which includes inspection, palpation, auscultation and rectal examination with assistance for 3-6 months. Twelve of the panelists agreed with the competency statement and two disagreed. One said to "delete rectal examination." The rationale given was "this is a task for the M.D. or nurse practitioner." One recommended a change in competency statement to "Perform a cardiovascular assessment noting abnormalities related to inspection of skin, mucous membrane, neck veins, thorax, and capillary refill." The rationale given was "now measurable."

\*\*\*C. Communicate assessment findings/data according to policy and procedure. Fourteen of the panelists agreed with the competency statement.

\*\*\*D. Document assessment finding/data according to policy and procedure. Fourteen of the panelists agreed with the competency statement.

E. Assess for physiologic changes indicative of decreased tissue perfusion. Thirteen panelists agreed with

the competency statement and one disagreed. One suggested changing "Assess to monitor for." The rationale given was "easier to measure."

F. Implement prescribed therapies for signs indicative of decreased tissue perfusion. Thirteen of the panelists agreed with the competency statement and one disagreed. One suggested changing to "implement prescribed therapy to increase tissue perfusion." The rationale given was "more specific."

G. Recognize signs and symptoms of pathophysiologic changes which occurs in coronary heart disease. i.e. fatigue, dyspnea, chest pain on exertion, edema, rales etc. Thirteen of the panelists agreed with the competency statement and one disagreed. One panelist recommended "recognize pathophysiologic signs and symptoms associated with coronary artery disease." The rationale given was that "there is no need to differentiate signs and symptoms."

\*\*\*H. Recognize all life-threatening dysrhythmias. Fourteen of the panelists agreed with the competency statement.

\*\*\*I. Implement prescribed therapies for life-threatening dysrhythmias. Fourteen of the panelists agreed with the competency statement.

J. Assess dysrhythmias for physiologic effects upon patient. Thirteen of the panelists agreed with the

competency statement and one disagreed. One panelist suggested changing to "assess for physiologic changes occurring with dysrhythmias onset." The rationale given was "patient effects are being assessed, not dysrhythmias." "It is now clearer."

\*\*\*K. Recognize indications for defibrillation. Fourteen panelists agreed with the competency statement.

M. Identify types of MI with respect to cardiac location and expected/potential hemodynamics consequences/complications of each type. Twelve panelists agreed and two disagreed. One suggested "identify location of M.I." No rationale was given for this decision. One suggested "add nursing diagnosis following complications." The rationale given was "will broaden nursing implications for each type of M.I."

\*\*\*N. Identify cardiac enzymes and isoenzymes changes associated with M.I. Fourteen panelists agreed with the competency statement.

\*\*\*O. Recognize risk factors associated with myocardial infarction. Fourteen panelists agreed with the competency statement.

\*\*\*P. Assess for capillary refill. Fourteen panelists agreed with the competency statement.

\*\*\*Q. Assess for amount of jugular venous pressure. Thirteen panelists agreed with the competency statement and

one disagreed. One panelist suggested changing to "assess for presence of jugular venous distention." No rationale was given for this decision.

Domain 2: Effective Management of Rapidly Changing Situation

Competency Statements

\*\*\*A. Perform the defibrillation as per hospital policy and procedure. Fourteen panelists agreed with the competency statement.

B. Intervene by problem identification in life threatening emergencies. Thirteen panelists agreed with the competency statement and one disagreed. One panelist suggested changing to "Intervene according to hospital policy in life threatening emergencies." The rationale given was "Intervene with a skill."

Domain 3: Administering and Monitoring Therapeutic Interventions

Competency Statements

\*\*\*A. Perform the procedure for 12-lead EKG in the absence of the EKG technician. Fourteen panelists agreed with the competency statement.

\*\*\*B. Select EKG monitoring lead which optimizes p-wave morphology with assistance for three months. Fourteen panelists agreed with the competency statement.

\*\*\*C. Select EKG monitoring lead which optimizes R-wave

morphology with assistance for three months. Fourteen panelists agreed with the competency statement.

\*\*\*D. Monitor electrocardiographic changes associated with each type of M.I. with assistance for three months. Fourteen panelists agreed with the competency statement.

\*\*\*E. Revise nursing care priorities based upon changes in patient status. Fourteen panelists agreed with the competency statement.

\*\*\*F. Utilize infection control measures in patient situations as defined in hospital infection control policy annual. Fourteen panelists agreed with the competency statement.

G. Monitor for indications for thrombolytic therapy. Twelve panelists agreed with the competency statement and two disagreed. One panelist who disagreed suggested to change "Monitor to assess." No rationale was given for this decision. One suggested to change "monitor to identify." No rationale was given for this decision.

\*\*\*H. Monitor for contraindications in thrombolytic therapy. Fourteen panelists agreed with the competency statement.

\*\*\*I. Administer thrombolytic therapy according to prescribed interventions. Fourteen panelists agreed with the competency statement.

\*\*\*J. Assess for physiologic changes indicative of

complications following thrombolytic therapy. Fourteen panelists agreed with the competency statement.

\*\*\*K. Assess for physiologic changes indicative of reocclusion and reinfarction. Fourteen panelists agreed with the competency statement.

Domain 4: Monitoring and Ensuring Safe Care of the  
Temporary Pacemaker Patients

Competency Statements

\*\*\*A. Perform skills specific to a temporary pacemaker including attachment of catheter to generator system. Fourteen panelists agreed with the competency statement.

\*\*\*B. Perform sensitivity and stimulation threshold checks. Fourteen panelists agreed with the competency statement.

\*\*\*C. Assess for capture and sensing. Fourteen panelists agreed with the competency statement.

\*\*\*D. Change pacemaker battery. Fourteen panelists agreed with the competency statement.

\*\*\*E. Troubleshoot for undersensing. Fourteen panelists agreed with the competency statement.

\*\*\*F. Troubleshoot for failure to pace. Fourteen panelists agreed with the competency statement.

\*\*\*G. Troubleshoot for failure to capture. Fourteen panelists agreed with the competency statement.

Domain 5: Assistive Role

Competency Statements

\*\*\*A. Establish short and long term goals with patient/and significant other to enhance recovery and/or maintain the quality of life. Fourteen panelists agreed with the competency statement.

\*\*\*B. Assist patient/family in participating with care. Fourteen panelists agreed with the competency statement.

\*\*\*C. Utilize other administrative service to support patient care. Fourteen panelists agreed with the competency statement.

\*\*\*D. Provide time for family members to express their feelings and concerns relating to patient illness with assistance for three months. Fourteen panelists agreed with the competency statement.

\*\*\*E. Provide comfort measures specific to activity, limitation, pain control, and medication side effects. Fourteen panelists agreed with the competency statement.

Domain 6: Teaching Coaching Function

Competency Statements

A. Recognize patient knowledge regarding condition, procedures, equipment and implement nursing care. Thirteen panelists agreed with the competency statement and one disagreed. One suggested to change "Recognize to Assess." No rationale was given for this decision.

B. Implement teaching plans as per assessed patient/significant other learning needs and pre-existing teaching

program. Thirteen panelists agreed with the competency statement and one disagreed. One suggested changing competency statement to "Implement teaching plans as per assessment." The rationale for this decision was "reads better and easier."

Domain 7: Monitoring and Ensuring Safe Nursing Care  
Competency Statements

A. Interpret the physiological assessment data that reflect current patient condition and developing trends. Thirteen panelists agreed with the competency statement and one disagreed. One suggested "deleting." The rationale given was "too vague."

\*\*\*B. Document physiological data as per policy and procedure. Fourteen panelists agreed with the competency statement.

\*\*\*C. Assess PA, CVP, and arterial pressure wave forms as to catheter location, wave form quality and normal/abnormal values with assistance for three months. Fourteen panelists agreed with the competency statement.

D. Titrate prescribed vasoactive and inotropic infusions as to changes in arterial pressure and SVO<sub>2</sub> values with assistance for three months. Thirteen panelists agreed with the competency statement and one disagreed. One panelist suggested to change competency to "Titrate vasoactive and inotropic infusion according to protocol and hospital

policy." No rationale was given for this decision.

\*\*\*E. Communicate assessment data to members of the health care team. Fourteen panelists agreed with the competency statement.

\*\*\*F. Perform hemodynamic monitoring according to hospital policy and procedures. Fourteen panelists agreed with the competency statement.

G. Perform procedure utilized for patients that are specific to bedside equipment on patient attachment, equipment set-up, patient monitoring and equipment troubleshooting. Thirteen panelists agreed with the competency statement and one disagreed. One panelist suggested to change competency statement to "Perform correct procedures for patient attachment, equipment set-up, patient monitoring troubleshooting for all bedside monitoring therapy equipment." The rationale given for the decision was "clearer."

\*\*\*H. Recognize hazards to patient safety. Fourteen panelists agreed with the competency statement.

\*\*\*I. Implement procedures to assure safe patient environment according to hospital safety manual. Fourteen panelists agreed with the competency statement.

\*\*\*J. Implement therapeutic procedures for descriptive chest pain as per standing or written order. Fourteen panelists agreed with the competency statement.

\*\*\*K. Perform airway suctioning as per standards of care and procedures. Fourteen panelists agreed with the competency statement.

Domain 8: Surveillance of Mechanical Ventilation

Competency Statements

\*\*\*A. Identify malfunctioning or failure of the ventilator. Fourteen panelists agreed with the competency statement.

\*\*\*B. Initiate nursing action to ensure patient ventilates when ventilator failure occurs. Fourteen panelists agreed with the competency statement.

\*\*\*C. Identify methods of weaning and nursing observation indicative of successful/unsuccessful weaning. Fourteen panelists agreed with the competency statement.

\*\*\*D. Respond appropriately to sounding of specific ventilator setting alarms. Fourteen panelists agreed with the competency statement.

E. Assess patient's response to ventilator modes and identify readiness to wean with assistance for three to six months. Thirteen panelists agreed with the competency statement and one disagreed. One suggested to add "Collaborate with respiratory therapist." No rationale was given for this decision.

Domain 9: Managing Computerized Data

Competency Statements

\*\*\*A. Access hemodynamic data related to cardiac output,

preload, afterload, and contractility. Fourteen panelists agreed with the competency statement.

\*\*\*B. Access computer decision aids to initiate appropriate therapeutic regime. Fourteen panelists agreed with the competency statement.

\*\*\*C. Document validated computerized data related to cardiovascular status as per unit policy. Fourteen panelists agreed with the competency statement.

#### Summary

Fourteen clinical nurse specialists participated in this study to determine the essential competencies needed by beginning level coronary care nurses. The competencies identified were beyond basic nursing preparation. The data were obtained through the use of a three-round Modified Delphi Technique.

Round One, Part I revealed that the eight competencies identified by Canfield in 1979 were current for practice and should not be deleted, but all needed modification.

Round One, Part II (Pilot Study) generated 26 competencies, on seven of which the panel reached consensus. All were current for practice, met the criteria, should not be deleted, but the remainder needed modification. One panelist indicated competency C under domain 1, B, C, and D under domain 2 were advanced skills for a beginner and some assistance should be provided for three months during

orientation.

Round One Part III was the broad open-ended question in which panelists were to address current innovative approaches, pharmaceutical interventions, technologic advances, computer assisted technology and were beyond basic nursing preparation. The panelists listed 19 proposed competencies which were categorized under four domains.

Round Two revealed 56 competencies that were current for practice, should not be deleted, 11 of which met the criteria, and 45 needed some modification.

Round Three revealed 63 competency statements that were categorized under nine domains. The panelists validated by consensus that 56 competencies met the stated criteria, were useful in current practice, and none should be deleted. Some minor modifications were suggested by one or two panelists. These suggestions were very minor and therefore the writer chose to leave the competency statement as agreed by the majority.

## Chapter 5

### Summary, Conclusions and Recommendations

The final chapter contains the summary, conclusions, and recommendations of the study. Specifically the chapter is divided into seven major sections: (a) summary of purpose; (b) pilot study; (c) summary of present study; (d) summary of findings; (e) conclusions; (f) recommendations; and (g) implications.

#### Summary of Purpose

The purpose of this study was to identify those clinical competencies, as perceived by clinical nurse specialists, that are needed by the beginning level coronary care nurse. More specifically, the study sought to gain consensus from experts in coronary critical care nursing about the cognitive and technical skills that are deemed essential for beginning level coronary care nurses to practice in coronary care units. Data for the study were obtained by using a modified Delphi Technique.

#### Pilot Study

A pilot study was completed to assess the feasibility of this study and to obtain information for improving the study (see appendix A). A three-round Delphi Technique method was used to collect data for a competency based orientation program to be used in coronary care units for

beginning level coronary care nurses. Three clinical nurse specialists practicing in a coronary care unit served as experts in the pilot study. These panelists generated 26 competency statements and seven domains which served as the foundation for the present study.

#### Summary of Present Study

Fourteen clinical nurse specialists currently practicing in medical centers in several large northeast American cities participated as panel members in this Delphi study. The panelists were sent packets by mail which consisted of a cover letter, procedure for the respective round, instructions, the developed questionnaire, background information related to the study, definition of terms, and self-addressed envelopes for each of the three rounds, using a modified Delphi Technique.

#### Round One

The broad question asked in this study was: What competencies beyond basic nursing preparation must the nurse at the beginning level of practice possess in order to provide the coronary critical care patient with safe nursing care? This question was posed to the panelists through telephone contact requesting their participation in the study and in the instructions for completing the questionnaire in Round One. Round One questionnaire was divided into three sections (Parts I, II, and III; see

Appendix B).

Part I listed eight competency statements identified by Canfield from a previous study in 1979. The panelists were asked to indicate whether each listed competency statement was current, should be deleted, or should be modified, and to provide a rationale for each decision.

Part II listed seven domains and 26 competency statements generated through the pilot study. The panelists were asked to evaluate their usefulness for beginning level coronary care nurses. Specifically, the panelists were asked to note whether the competency statements were current, should be modified, or should be deleted. The panelists were requested to provide a rationale for their decision for deleting or modifying the competency statements.

Part III elicited additional competencies that were not listed in Parts I and II and would be beyond basic nursing preparation for the nurse at the beginning level of practice in a coronary care unit. The panelists were instructed to focus on current innovations, pharmaceutical interventions, technological advances, computer assistive technology and should be directed to a specific role (staff), setting (coronary care unit), and entry level of practice. Part III generated additional competencies and domains. The responses were tabulated and all were used in Round Two.

### Round Two

The responses taken from Round One were categorized into domains and competency statements. Domains refers to the knowledge and the competencies related to required skills of the beginning level coronary care nurses. The competency statements were designed to be learner oriented, behaviorally described, and measurable. The competency statements prepared from the responses were mailed to the panelists for evaluation according to the stated criteria. The panelists were asked to rewrite the competency statement to meet their approval in the area in which there was nonconcurrence and give a rationale for each decision. A cover letter, instruction sheet, background information, procedure, definition of terms, stamped self-addressed large brown envelope, and copy of the results from Round One were enclosed to stimulate the panelists to creatively identify new competencies.

### Round Three

The categorized responses from Round Two were tabulated and returned to the panel to validate the refined data. On the Round Three Questionnaire, Round Two competency statements were placed to the left of Round Three competency statements for the panelists' perusal and review. The panelists were asked to validate each competency statement using the criteria: learner oriented; behaviorally

described; and measurable. The panelists were given an opportunity to rewrite the competency statement with which they disagreed.

#### Summary of Findings

An analysis of the data collected in the study provided the following findings:

The eight competencies identified by Canfield in 1979 were currently used in practice and should not be deleted, but needed modification.

Nine domains and 63 competency statements including Canfield's were generated. The panel perceived the largest number of competency statements under the domain of diagnostic and monitoring functions. There was a high agreement with the competency statements among the panelists under this domain. Consensus was reached in 10 out of 17 of the competency statements. Sixteen of the competency statements were cognitive skills and one was affective. The cognitive skills related to: knowledge (recognize, and identify); comprehension (interpret and communicate); application (implement, document and perform); analysis (diagnose and predict); and evaluate (assess and evaluate). This may indicate that the nurse has vital responsibilities in assisting with the diagnosis of coronary artery disease. These competency statements are complex, as 12 panelists indicated that assistance is needed for three to six months

for the beginning level coronary care nurse. The two dissenters' rationale for disagreeing was: to eliminate a task that is reserved for the physician or nurse practitioner; and, to reorder the sequence of the tasks. The literature supports these competencies as providing coronary care nurses with better access to relevant facts to assist in making diagnostic decisions; consequently, they were not deleted.

The next highest competency statements were under domain 3: administering and monitoring therapeutic interventions, which generated 11 competency statements. On ten of these competency statements the panelists reached consensus. Eleven of these competency statements were deemed to be on the cognitive level. This response may be another indication that the coronary care nurse's role is changing and becoming more complex. This concept supports the literature that the benefits of monitoring technology provide nurses with automatic assessment of physiological changes and an array of hemodynamic variables every two minutes, so that information is processed and reevaluated in caring for the coronary critically ill patient. The complex data obtained are crucial to timely interventions, because sudden critical changes in the patient's status require nurses to make accurate decisions rapidly.

The next highest number of competency statements was generated under domain 7: monitoring and ensuring safe nursing care. Ten competency statements were generated, seven in which the panelists reached consensus. The ten competency statements were deemed to be on the cognitive level. These competency statements are very complex and require didactic educational programs to prepare coronary care nurses to function and meet the needs of coronary care patients.

Overall, there was a high agreement among the panelists in which consensus was reached with 47 competency statements. Many of the competency statements indicate that the responsibilities of the CCU nurse are continuing to expand, requiring increased specialized knowledge; this is supported by the literature which states that extended educational requirements are necessary.

Disagreement among the panelists was low in Round Three. Out of 12 competency statements in which there was disagreement, only one panelist disagreed at any given time with the competency statements, and there were only three competency statements in which two panelists disagreed. Their rationales were minor and noncontributory.

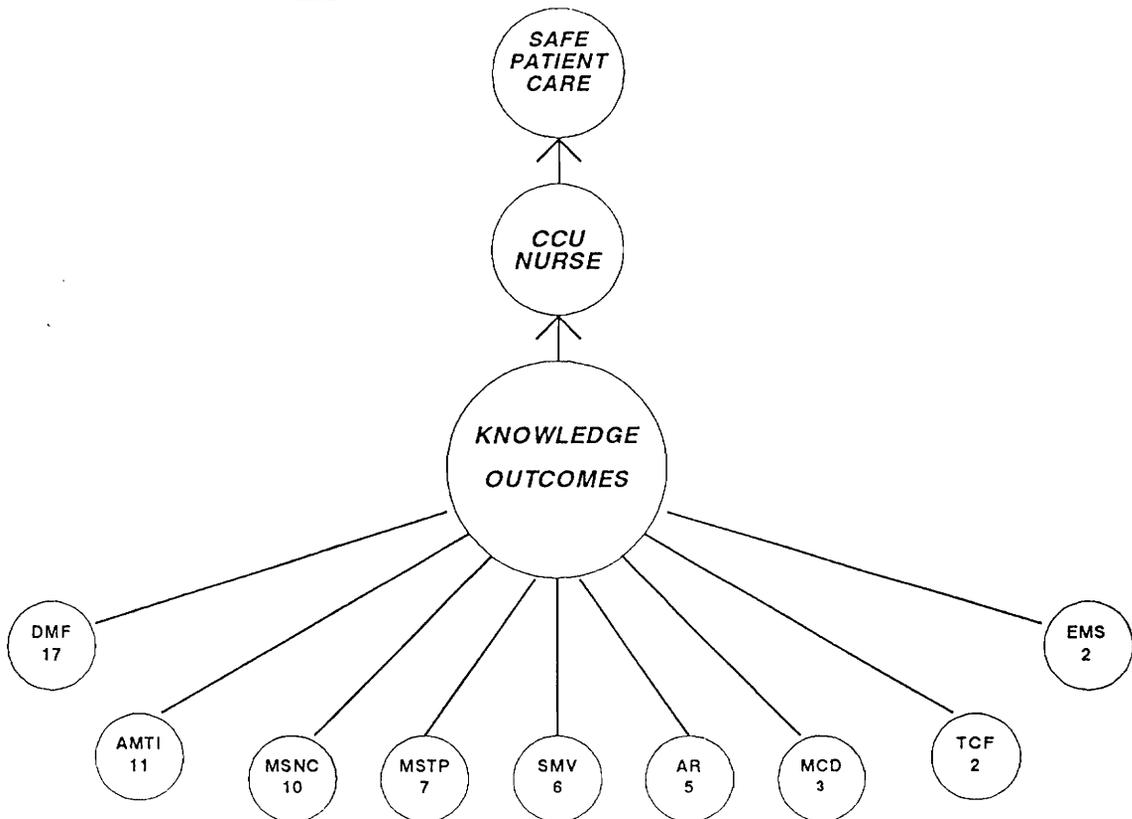
Some panelists perceived a need for assistance in developing and refining skills in the competencies for three to six months before the beginning level coronary care nurse

can be expected to perform independently. Some panelists indicated that assistance is needed for seven of the competencies, and no assistance is needed for the remaining 56 competencies. This response is another indication that the competency statements are complex, and the beginning level coronary care nurse may experience difficulties. Subsequent domains included fewer competency statements, with the fewest being under domain 9: managing computerized data.

#### Competency Model for Coronary Care Nurses

The competency based education model illustrates nine domains. Domains refer to the knowledge required for the beginning level coronary care nurse. Each of the domains have competency statements which relate to required skills of the beginning level coronary care nurses.

The domain of diagnostic and monitoring function (DMF) has the highest number of competency statements (17) and the domain, managing computerized data (MCD) has the lowest competency statements.

**COMPETENCY MODEL FOR CORONARY CARE NURSES**

DMF-DIAGNOSTIC & MONITORING  
FUNCTIONS (17 COMPETENCIES)

AMTI-ADMINISTERING & MONITORING  
A THERAPEUTIC SITUATION  
(11 COMPETENCIES)

MSNC-MONITORING & ENSURING  
SAFE NURSING CARE  
(10 COMPETENCIES)

MSTP-MONITORING & ENSURING SAFE  
CARE OF A TEMPORARY PACEMAKER  
(7 COMPETENCIES)

SMV-SURVEILLANCE OF MECHANICAL  
VENTILATION (6 COMPETENCIES)

AR-ASSISTIVE ROLE  
(5 COMPETENCIES)

MCD-MANAGING COMPUTERIZED  
DATA (3 COMPETENCIES)

TCF-TEACHING COACHING  
FUNCTION (2 COMPETENCIES)

EMS-EFFECTIVE MANAGEMENT OF A  
RAPIDLY CHANGING SITUATION  
(2 COMPETENCIES)

## Conclusions

This study is based, in general, on a body of theoretical and research literature dealing with competency based education. Adult education theorists such as Knowles (1980), and Elias and Merriam (1980), as well as nursing theorists such as Benner (1982), Del Bueno and Altona (1984, 1985), Primm (1986), and Alspach (1984), have contributed significantly to supporting or demonstrating the utility of competency based education. More specifically, this study followed the investigations of those who sought to identify competencies for critical care nursing including Pinneo et al. (1960), Canfield (1979), Freeman et al. (1982), and Smith and Altieri (1988).

Meltzer, Pinneo, and Kitchell conducted a three-year study in the early 1960's which demonstrated the effectiveness of coronary care units (cited in Sweetwood, 1971). They found that the mortality rate in coronary care units varied with the competence and training of the professional nursing staff. The competencies were assessed by directly observing coronary care nurses as they performed such vital procedures as arrhythmia recognition and treatment, medication administration and care of the patient with a temporary pace maker insertion (Pinneo, 1991).

Canfield (1979) delineated 102 competencies through a panel of experts for beginning level baccalaureate critical

care nurses. There were eight competencies specifically identified for coronary care nurses. Her findings revealed a significant difference in the perception of nursing educators and nursing administrators as to which clinical competencies are necessary for beginning baccalaureate level practitioners of critical care nursing. The eight competencies identified related to coronary care were used as a foundation for this study.

Freeman et al. (1982) designed a competency based education program for critical care nursing, which used Bloom's taxonomy and described a hierarchy of competencies for critical care nurses into three levels: psychomotor (doing); cognitive (thinking); and affective (feeling). They used a committee, consisting of head nurses from various critical care units, two educators, an administrator in nursing, an instructor, and other unidentified members within the hospital. The experience and educational preparation were not given. The program was used for staff development and was implemented over a period of several years. The present study is similar to Freeman et al. (1982) in that Bloom's taxonomy was used. The population and method used to identify the competencies in the current study were different from Freeman et al. (1982).

In 1988, Smith and Altieri developed a clinical competence assessment tool (CCAT) through a task force of

head nurses and educators of critical care units at the Boston Veterans Administration Hospital in Boston, Massachusetts. Several methods were pursued prior to the development of the CCAT. The group decided to use an already existing tool that had been tested for its reliability and validity through field testing. The tool "measured the presence of knowledge in critical care nursing and was designed by Toth and Richie in 1984" (Smith & Altieri, 1988, p. 20). Five general skill areas of basic competence required of beginning level intensive care unit practitioners, including hemodynamics, basic cardiac dysrhythmias, mechanical ventilators, 12-lead ECG's and simulated cardiac arrests, were incorporated in the CCAT. The tool was implemented with a nursing service policy to lend credibility and legitimacy. Smith and Altieri (1988, p. 21) said that such factors as "the diverse nature of critical care nursing, combined with the differences in individual learning abilities of the nursing staff, make evaluation of clinical competence a difficult task. However, the tool provides an excellent mechanism for addressing the factors and can easily be adapted to meet the needs of individual institutions."

The methodology and findings of this study expanded previous research in several areas such as technology innovation, pharmaceutical interventions, and complex

responsibilities that contribute to early diagnosis of a myocardial infarction. Previous research utilized observation (Pinneo et al. (1960), committee or task force (Freeman et al. 1982, Smith and Altieri, 1988), and Canfield survey methodology. This study utilized a modified Delphi Technique to elicit the authority opinions of 14 experienced clinical nurse specialists currently practicing in the coronary care unit. The Delphi Technique was used because the literature revealed a scarcity of information in nursing and to obtain the most reliable consensus of opinion of a group of experts by a series of structured questionnaires distributed with managed feedback while permitting the panelist an opportunity to revise views, assess other panelist views, and deal with a complex problem.

In general, findings from this study provided evidence of the expanding role of the coronary care nurse and the extent to which this role has been impacted upon by societal trends, most notably, the technological expansion and the increasingly collaborative nature of health care.

Canfield's competencies were consistently viewed as current for practice, indicating that there is a basic core of nursing practice that is fairly constant, specifically that which relates to monitoring of the patient's condition. Canfield's competencies were modified considerably in the present study in a manner that reflected not only the

expansion of knowledge in coronary care but also the impetus for a more scientifically based practice of nursing. Additionally, the literature clearly supported the contention that a competency based orientation program for coronary care nurses grounded in current research was needed to determine the competencies required for the beginning level coronary care nurse to practice in a coronary care unit.

A trend towards increasing complexity began when the pilot study participants identified an additional 26 competencies beyond Canfield's. These competencies illustrated the influence of the impact of the recent technological expansions on nursing practice. The identified competencies also reflected that nurses are assuming functions that were formerly in the purview of the physician. Other competencies identified in the pilot study reflected an increasing emphasis: on cultural diversity; on the notion of a patient provider partnership; and on the role of nursing as a partner in a multidisciplinary health team.

This trend towards increasing complexity continued, when the panelists in the first round of the present study not only agreed to maintain the previously identified competencies but also proposed additional competencies. Most of these competencies reflected more sophisticated

areas. Interestingly, seven panelists recommended six competencies to include "with assistance for three to six months," suggesting that the competency may be advanced or difficult for the beginning level coronary care nurse. Additionally, many competency statements were refined to make them clear and more behaviorally written.

This study also expanded Canfield's findings (1979) in that it identified competencies needed at the end of an orientation period rather than upon graduation from the baccalaureate degree program. The identification of post orientation competencies should permit an assessment before orientation, should guide the development of orientation programs specifically tailored to the needs of the individual nurse, and provide a basis for post orientation evaluation.

The competencies identified in this study were also different from Canfield's (1979) in that Canfield's competencies were instructional, cognitive, and confined to monitoring and interpreting. The competencies identified in this study were clinical observable, behaviorally described, cognitive, psychomotor, and affective. The competencies of this study were categorized into nine domains and they were designed to be organized into self-directed modules so that each neophyte can pace mastering the competencies according to his/her previous level of competence and specific

learning abilities.

It is anticipated that most of the competencies will be applicable to any coronary care unit. However, since the study was conducted at major teaching and research hospitals, it is acknowledged that a few of the competencies may be limited to these settings. These competencies may include (see Appendix D), domain 3A (Perform the procedure for 12-lead EKG in the absence of EKG technician), B (Select EKG monitoring lead which optimizes P-wave morphology), and C (Select EKG monitoring lead which optimizes R-wave morphology); and domain 9A (Access hemodynamic data related to cardiac output, preload afterload and contractility), and B (Access computer decision aids to initiate appropriate therapeutic regime).

In summary, the findings demonstrate that the role of the coronary care nurse is becoming increasingly sophisticated and complex. The findings support the need for identified or specific competencies for the different nursing areas in order to focus inservice programs. It is anticipated that competency based orientation programs can be more cost effective in producing sound practitioners than using the traditional approach.

### Recommendations

A review of the findings and conclusions of this study provided recommendations of two types: (a) recommendations

resulting from this study and (b) recommendations for further research.

Recommendations resulting from the study

1. It is recommended that the competencies identified in this study be reviewed for use as a basis for orientation programs for coronary care nurses.
  - (a) Modules can be developed around each of the nine domains to provide instructional packages for independent study and inservice education.
  - (b) Since each of the competencies are designed for clinical demonstration, there are two thrusts:
    - (i) formal study in terms of formulating goals, objectives, planning for implementation, and designing activities; and,
    - (ii) actual practice of the competencies in real life situations in preceptor relationships.
2. It is recommended that implementation of the nine domains and 63 competencies for coronary care nurses be considered for use as evaluation criteria.
3. It is recommended that the nine domains identified in this study be considered for use in developing formal policies and procedures in coronary care units.
4. It is recommended that the 63 competencies included in this study be considered for use in developing certification criteria for coronary care nurses.

Recommendations for further research

1. A similar research study might be conducted nationwide to determine if the findings are regionally biased and to determine if the opinions of a national sample of clinical nurse specialists toward the competencies for beginning level coronary care nurses expands. This would serve as additional refinement and/or validation of the model.
2. A research study might be conducted to determine the extent to which successful coronary care nurses are able to practice the delineated competencies.
3. A research study might be conducted to determine what factors interfere with the successful implementation of the domains and 63 competencies.

Implications

If applied research is to be useful, it must be considered in light of what it suggests for everyday application and practice. The design of this study encompassed the characteristics of a competency based education in that the competencies were: a) validated by expert practitioners in the field; b) directed at a specific role and setting, current innovations, pharmaceutical interventions, technologic advances, and computer assisted technology; c) clearly delineated and learner centered; and d) centered on performance and knowledge outcomes.

The importance attributed to the nine domains by the panelists validates that the model adequately defines the parameters for an orientation program for beginning level coronary care nurses and for its implementation. As such, the competency based model offers unlimited possibilities for application.

The identified competencies relate directly to the beginning level coronary care nurse, which makes it easy to facilitate implementation. The identified competencies are performance oriented, measurable skills which can be demonstrated and observed in practice. In addition to their application, the competencies could be valuable in evaluating performance and in developing certification criteria.

The complexity and expansion of the coronary care nurse role mandates that appropriate changes in educational programs are required to broaden the scope of knowledge, skills, and abilities. This consensually validated competency based model can provide direction for educational programmatic efforts.

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## Appendix A

### Pilot Study

A three-stage Delphi Technique method was used to collect data for a competency based orientation model to be used in coronary care units for beginning level coronary care nurses. Three clinical nurse specialists with a master's degree in nursing currently practicing in a coronary critical care unit participated as the expert panel in this pilot study. These participants were not used in the major study.

The expert panel was asked the following questions:

1. What technical skills must a nurse have to be considered competent to practice at the beginning level on the coronary care unit?
2. What body of knowledge must the nurse at the beginning level of practice possess in order to provide the coronary critical care patient with safe nursing care?

#### Round One

The investigator called each panel member before sending the Round One questionnaire. The panel member responses were tabulated and a consensus from two or more of the experts were put in a pool to be used in the preparation of the competency based orientation model.

### Round Two

Round Two was eliminated because the participants were in agreement with the exception of two competencies. The two competencies that did not have the experts' consensus were discussed with them indirectly by telephone. All expert panel members participants agreed that the two competencies may be needed after the coronary care patient has recovered significantly to be transferred to a subacute unit.

### Round Three

The pool of responses to be used in the competency based orientation model taken from Round One were categorized and made into learner oriented, behaviorally described and measurable competency statements. These competency statements were then sent to the panel of experts for concurrence and to evaluate whether the statements were learner oriented, behaviorally described and measurable. The experts were asked to rewrite the competency statements to achieve their concurrence. The returned responses to Round Three were tabulated with a 95 percent consensus. One statement was not used because it did not meet the criteria, and panel members felt it was covered in another competency.

### Results

Findings based on data from the pilot study are presented under the research questions to which the data pertain. Data obtained from Round Three have been

categorized as Domain and Competencies. Domains refer to the knowledge; Competencies relate to required skills of the beginning level coronary care nurses.

Research Question One: What technical skills must a nurse have to be considered competent to practice at the beginning level on the coronary care unit?

DOMAIN

COMPETENCIES

Diagnostic and monitoring function

Assess physiologic changes indicative of decreased tissue perfusion

Assess chest pain  
Recognizes all lethal arrhythmias

Assess psychological signs of depression, anxiety, fear and denial

Recognize indications for defibrillation

Effective management of rapidly changing situation

Perform the procedure for defibrillation in an emergency

Perform in extreme life threatening emergencies: Rapid identification of the problem and implements medical and/or nursing plan

Identify and manage a patient crisis until the physician arrives

Contingency management: Rapid matching of demands and technical resources in an emergency situation.

Administering and monitoring therapeutic interventions

Perform the procedure for 12-lead EKG

Meets nursing practice standards related to care of the patient who requires procedures

**Research Question Two:** What body of knowledge must the nurse at the beginning level of practice possess in order to provide the coronary critical care patient with safe nursing care?

**DOMAIN****COMPETENCIES**

**Monitoring and ensuring safe nursing care**

Document the following physiological assessment data that reflect pertinent trends in the patient condition:

- (a) Interpret significant related laboratory data such as cardiac enzymes, arterial blood, and CBC.
- (b) Communicate assessment data to appropriate members of the health care team as the patient's situation warrants.
- (c) Calibrate the transducers accurately and zeroed the system to atmospheric air.
- (d) Identify correctly pressure wave form.

**Surveillance of mechanical ventilation**

Respond appropriately to sounding of specific ventilator settings alarms

Identify the ventilator settings and mode used in a mock situation

**Assistive Role**

Provide comfort measures

Act as a psychologic and cultural mediator

Utilize goals therapeutically

Maximize patient participation and control in his/her recovery.

## DOMAIN

Teach coaching  
function

## COMPETENCIES

Recognize patient knowledge deficit regarding condition, procedures, equipment, future impact of heart on life style and implement nursing plan.

Provide an interpretation of the patient's condition and giving a rationale for procedures.

Capture a patient's readiness to learn.

## Appendix B

JESSYE D. SPENCER, M.Ed., BSN  
P.O. BOX 484  
BEDFORD, MASSACHUSETTS 01730

Dear

Thank you for agreeing to serve as an expert for my doctoral study, "Competencies Needed For the Beginning Level Coronary Critical Care Nurses: A Delphi Study." I believe you will find it exciting as well as helping to fulfill the quest of the American Association of Critical Care Nurses (AACCN) for more research in coronary care.

Enclosed is a copy of the instructions and other informational material for Round One. After completing Round One, (Parts I, II & III questionnaire) please return to me. The content that you include will be made into competency statements and returned to you for round 2 responses. The results of Round Two will be tabulated and sent to you for validation in Round Three.

If you wish to have the results of the study, I will share the information with you. You may reach me at (617) 275-7500 ext. 232 during the day and call collect at (617) 275-5615 after 6:00 P.M.

I look forward to your response by January 29, 1992.

Sincerely,

JESSYE D. SPENCER

Enclosures:

Background Information of Study  
Procedure: Rounds One, Two and Three  
Instructions  
Competencies (Parts I and II questionnaire)  
Delphi question (Part III questionnaire)  
Definition of Terms

COMPETENCIES NEEDED FOR THE BEGINNING LEVEL CORONARY  
CRITICAL CARE NURSES: A DELPHI STUDY

BACKGROUND INFORMATION

Coronary critical care nurses require competencies beyond basic nursing preparation, which are usually provided through inservice training as part of the orientation to the coronary care unit at a hospital. Continuing advances in procedures, technologies, and pharmaceutical interventions mandate that these competencies be updated and clearly specified.

The purpose of this study is to identify the competencies beyond basic nursing preparation that the nurse at the beginning level of practice must possess in order to provide the coronary critical care patient with safe nursing care. The study will assist in developing new strategies and reevaluating current approaches that are critically needed for safe patient care. This study elicits the perspectives of experts in coronary critical care about the essential cognitive and technical skills required of nurses practicing in coronary care units.

A modified Delphi Technique will be used to obtain this information. Three rounds will be used to elicit your perspective as one of fifteen clinical nurse specialists with masters degree in nursing who are practicing in a coronary critical care unit in the northeast. This will aid nursing educators in planning a program in health settings to assure that nurses who practice in a coronary care unit have the specialized knowledge and skills needed to provide safe quality care.

## PROCEDURE

ROUND ONE

This package constitutes Round One. Round One seeks your perspective as an important member of the panel which consists of fifteen clinical nurse specialists with two years of experience in a critical care unit and who are currently practicing in a coronary critical care unit. The respondent panel members are asked to answer the enclosed questionnaire Parts I, II, and III. Your responses will be tabulated and all responses will be used in round two. Each participant will remain anonymous.

ROUND TWO

Round two seeks consensus. The responses taken from round one will then be categorized as domain and competencies. Domain refers to the general knowledge areas and the competencies relate to required skills of the beginning level coronary care nurses. The competency statements will be learner oriented, behaviorally described, and measurable. The competency statements prepared from the responses will then be returned for evaluation. You are asked to rewrite any competency statement that you disagree with.

ROUND THREE

Round Three seeks your approval. You will receive categorized responses from Round Two for validation purposes.

## ROUND ONE INSTRUCTIONS

Enclosed please find the material for Round One - Parts I, II, III. Part I (pages 1-5) list eight (8) competency statements identified by Dr. Arleen Canfield from a previous study in 1979. Part II (pages 5-16) list seven (7) domains with competencies generated through a pilot study conducted in 1990 as a preliminary for the present investigation.

You are asked to indicate whether each listed competency is current, should be modified or should be deleted and to provide a rationale for each decision.

In Part III of Round One you are asked to identify any additional competencies that you think are necessary for the beginning level coronary critical care nurse that are not listed on Parts I and II. The purpose of this section is to generate responses from as many perspectives as possible for the panel to react to. Your input is extremely important. More specific directions are included with parts I, II and III.

## PARTS I AND II QUESTIONNAIRE

## PART I: COMPETENCIES IDENTIFIED BY DR. ARLEEN CANFIELD (1979)

## SECTION I A:

**DIRECTIONS:** Read the following eight (8) competency statements carefully and evaluate their usefulness for beginning level Coronary Care Nurses.

1. Note whether the competency statements:
  - a. are current
  - b. should be modified - you will have the opportunity to state how it should be modified
  - c. should be deleted
2. Circle either Y (Yes) or N (No) under each possible response

<u>COMPETENCY STATEMENTS</u>	<u>CURRENT</u>	<u>MODIFY</u>	<u>DELETE</u>
1. Describe the pathophysiology of coronary artery disease and the subsequent signs and symptoms	Y N	Y N	Y N
2. List the types of MI (anterior, posterior, inferior, diaphragmatic, transmural)	Y N	Y N	Y N
3. Monitor and interpret electrocardiographic changes associated with each type of MI	Y N	Y N	Y N
4. Recognize major arrhythmias and administer appropriate medications.	Y N	Y N	Y N
5. List and discuss the complications of MI (congestive heart failure, cardiogenic shock, pericarditis, arrhythmias)	Y N	Y N	Y N
6. Describe and interpret the enzyme changes associated with MI	Y N	Y N	Y N
7. Monitor and interpret central venous pressure, urinary output, arterial pressure changes: and adjust intravenous lines accordingly.	Y N	Y N	Y N
8. Monitor and interpret pressures from Swan-Ganz catheters (pulmonary artery and wedge pressures)	Y N	Y N	Y N

## SECTION 1 B

**DIRECTION:** In the space provided select the competency statements that need modification; modify the competency statement; give your rationale for the changes.

<u>COMPETENCY STATEMENTS TO BE MODIFIED</u>	<u>MODIFIED COMPETENCY</u>	<u>RATIONALE FOR MODIFICATION</u>
1. Describe the pathophysiology of coronary artery disease and the subsequent signs and symptoms.		
2. List the types of MI (anterior, posterior, inferior, diaphragmatic, transmural)		
3. Monitor and interpret electrocardiographic changes associated with each type of MI		
4. Recognize major arrhythmias and administer appropriate medications		
5. List and discuss the complications of MI (congestive heart failure, cardiogenic shock, pericarditis, arrhythmias)		
6. Describe and interpret the enzyme changes associated with MI		
7. Monitor and interpret central venous pressure, urinary output, arterial pressure changes; and adjust intravenous lines accordingly.		
8. Monitor and interpret pressures from Swan-Ganz catheters (pulmonary artery and wedge pressures)		

## SECTION 1 C

## SECTION I C:

**DIRECTIONS:** In the space provided select the competency statements that should be deleted and give your rationale for suggesting deletion.

<u>COMPETENCY STATEMENTS TO BE DELETED</u>		<u>RATIONALE FOR DELETION</u>
1. Describe the pathophysiology of coronary artery disease and the subsequent signs and symptoms.		
2. List the types of MI (anterior, posterior, inferior, diaphragmatic, transmural)		
3. Monitor and interpret electrocardiographic changes associated with each type of MI		
4. Recognize major arrhythmias and administer appropriate medications		
5. List and discuss the complications of MI (congestive heart failure, cardiogenic shock, pericarditis, arrhythmias)		
6. Describe and interpret the enzyme changes associated with MI		
7. Monitor and interpret central venous pressure, urinary output, arterial pressure changes; and adjust intravenous lines accordingly.		
8. Monitor and interpret pressures from Swan-Ganz catheters (pulmonary artery and wedge pressures)		

## PART II: DOMAINS AND COMPETENCY STATEMENTS GENERATED THROUGH A PILOT STUDY

## SECTION II A:

DIRECTIONS: Read the following 7 domains and 26 competency statements carefully and evaluate their usefulness for beginning level Coronary Care Nurses.

1. Note whether the competency statement:
  - a. are current
  - b. should be modified
  - c. should be deleted
2. Circle either Y (Yes) or N (No) under each possible response

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS</u>	<u>CURRENT</u>	<u>MODIFY</u>	<u>DELETE</u>
1. Diagnostic and monitoring functions	Assess chest pain	Y N	Y N	Y N
	Assess physiologic changes medicative of decreased tissue perfusion	Y N	Y N	Y N
	Recognize all lethal arrhythmias	Y N	Y N	Y N
	Recognize indications for defibrillation	Y N	Y N	Y N
	Assess psychological signs of depression, anxiety, fear and denial	Y N	Y N	Y N
2. Effective management of rapidly changing situation	Perform the procedure for defibrillation in an emergency	Y N	Y N	Y N
	Perform in extreme life threatening emergencies. Rapidly identifies problem and implement medical and/or nursing plan(s)	Y N	Y N	Y N
	Identify and manage a patient crisis until the physician arises	Y N	Y N	Y N
	Contingency management: Rapid matching of demands and technical resources in an emergency situation	Y N	Y N	Y N
3. Administering and monitoring therapeutics interventions	Perform the procedure for 12 lead EKG	Y N	Y N	Y N

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS</u>	<u>CURRENT</u>	<u>MODIFY</u>	<u>DELETE</u>
3. Administering and monitoring therapeutics interventions (con't)	Meet nursing practice standards related to care of the patient who requires suctioning procedures	Y N	Y N	Y N
	Implement medical plan for descriptive chest pain	Y N	Y N	Y N
	Implement medical plan for lethal arrhythmias	Y N	Y N	Y N
	Implement medical plan for signs indicative of decreased tissue perfusion	Y N	Y N	Y N
4. Assistive role	Provide comfort measures	Y N	Y N	Y N
	Act as a psychologic and cultural mediator	Y N	Y N	Y N
	Utilize goals therapeutically	Y N	Y N	Y N
	Maximize patient participation and control in his/her recovery	Y N	Y N	Y N
5. Teaching coaching function	Recognize patient knowledge deficit regarding conditions procedures equipment, future impact of heart on life style and implement nursing care plan.	Y N	Y N	Y N
	Provide an interpretation of the patient's condition and give a rationale for procedures	Y N	Y N	Y N

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS</u>	<u>CURRENT</u>	<u>MODIFY</u>	<u>DELETE</u>
6. Monitoring and ensuring safe nursing care	Document the following physiological assessment data that reflect pertinent trends in the patient condition: a. Interpret significant related laboratory data such as cardiac enzymes, arterial blood, and CBC. b. Communicate assessment data to appropriate members of the health care team as the patients situation warrants c. Calibrate the transducers accurately and zero the system to atmospheric air d. Identify correctly pressure wave forms	Y N	Y N	Y N
7. Surveillance of mechanical ventilation	Respond appropriately to sounding of specific ventilator setting alarms	Y N	Y N	Y N
	Identify the ventilator setting and mode used in a mock situation	Y N	Y N	Y N

SECTION II B:

SECTION II B:

**DIRECTIONS:** In the space provided select the domain and competency statement that need modification; modify the competency statement; give your rationale for the changes.

<u>COMPETENCY STATEMENTS TO BE MODIFIED</u>		<u>MODIFIED COMPETENCY</u>	<u>RATIONALE FOR MODIFICATION</u>
<b>DOMAIN</b>	<b>COMPETENCY STATEMENTS</b>		
1. Diagnostic and monitoring functions	Assess chest pain		
	Assess physiologic changes indicative of decreased tissue perfusion		
	Recognize all lethal arrhythmias		
	Recognize indications for defibrillation		
	Assess psychological signs of depression, anxiety, fear and denial		
2. Effective management of rapidly changing situation	Perform the procedure defibrillation in an emergency		
	Perform in extreme life threatening emergencies: Rapidly identifies problem and implement medical and/or nursing plan (s)		
	Identify and manage a patient crisis until the physician arrives		
	Contingency management: Rapid matching of demands and technical resources in an emergency situation		
3. Administering and monitoring therapeutic interventions	Perform the procedure for 12 lead ERG		

<u>COMPETENCY STATEMENTS TO BE MODIFIED</u>		<u>MODIFIED COMPETENCY</u>	<u>RATIONALE FOR MODIFICATION</u>
<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS</u>		
3. Administering and monitoring therapeutic interventions (con't)	Meet nursing practice standards related to care of the patient who requires suctioning procedures		
	Implement medical plan for descriptive chest pain		
	Implement medical plan for lethal arrhythmias		
	Implement medical plan for signs indicative of decreased tissue perfusion		
4. Assistive role	Provide comfort measures		
	Act as a psychologic and cultural mediator		
	Utilize goals therapeutically		
	Maximize patient participation and control in his/her recovery		
5. Teaching coaching function	Recognize patient knowledge deficit regarding conditions, procedures equipment, future impact of heart on life style and implement nursing care plan		
	Provide an interpretation of the patient's condition and giving rationale for procedures		

<u>COMPETENCY STATEMENTS TO BE MODIFIED</u>		<u>MODIFIED COMPETENCY</u>	<u>RATIONALE FOR MODIFICATION</u>
<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS</u>		
6. Monitoring and ensuring safe nursing care	Document the following physiological assessment data that reflect pertinent trends in the patient condition: a. Interpret significant related laboratory data such as cardiac enzymes, arterial blood, and CBC		
	b. Communicate assessment data to appropriate members of the health care team as the patients situation warrants		
	c. Calibrate transducers accurately and zero the system atmospheric air		
	d. Identify correctly pressure wave forms		
7. Surveillance of mechanical ventilation	Respond appropriately to sounding of specific ventilator setting alarms		
	Identify the ventilator setting and mode used in a mock situation		

## SECTION II C:

## SECTION II C:

**DIRECTIONS:** In the space provided select the domain and competency statement that need modification; modify the competency statement; give your rationale for suggesting deletion.

<u>COMPETENCY STATEMENTS TO BE MODIFIED</u>		<u>RATIONALE FOR DELETION</u>
<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS</u>	
1. Diagnostic and monitoring functions	Assess chest pain	
	Assess physiologic changes indicative of decreased tissue perfusion	.
	Recognize all lethal arrhythmias	
	Recognize indications for defibrillation	
	Assess psychological signs of depression, anxiety, fear and denial	
2. Effective management of rapidly changing situation	Perform the procedure for defibrillation in an emergency	
	Perform in extreme life threatening emergencies; Rapidly identifies problems and implement medical and/or nursing plan(s)	
	Identify and manage a patient crisis until the physician arrives	
	Contingency management: Rapid matching of demands and technical resources in an emergency situation	
3. Administering and monitoring therapeutic interventions	Perform the procedure for 12 lead EKG	
	Meet nursing practice standards related to care of the patient who requires suctioning procedures	
	Implement medical plan for descriptive chest pain	
	Implement medical plan for lethal arrhythmias	

<u>COMPETENCY STATEMENTS TO BE MODIFIED</u>		<u>RATIONALE FOR DELETION</u>
DOMAIN	COMPETENCY STATEMENTS	
3. Administering and monitoring therapeutic interventions (con't)	Implement medical plan for signs indicative of decreased tissue perfusion	
4. Assistive role	Provide comfort measures	
	Act as a psychologic and cultural mediator	
	Utilize goals therapeutically	
	Maximize patient participation and control in his/her recovery	
5. Teaching coaching function	Recognize patient knowledge deficit regarding conditions, procedures equipment, future impact of heart on life style and implement nursing care plan	
	Provide an interpretation of the patient's condition and giving a rationale for procedures	
6. Monitoring and ensuring safe nursing care	Document the following physiological assessment data that reflect pertinent trends in the patient condition:	
	a. Interpret significant related laboratory data such as cardiac enzymes, arterial blood, and CBC	
	b. Communicate assessment data to appropriate members of the health care team as the patients situation warrants	
	c. Calibrate the transducers accurately and zero the system atmospheric air	
	d. Identify correctly pressure wave forms	

<u>COMPETENCY STATEMENTS TO BE MODIFIED</u>		<u>RATIONALE FOR DELETION</u>
DOMAIN	COMPETENCY STATEMENTS	
7. Surveillance of mechanical ventilation	Respond appropriately to sounding of specific ventilator setting alarms	
	Identify the ventilator setting and mode used in a mock situation	

## ROUND 1 QUESTIONNAIRE PART III

Directions: Please review and respond to the following, broad, open-ended question in short, clear and concise statements. Focus on current innovations, pharmaceutical interventions, technologic advances, computer assistive technology and additional competencies that are not addressed in parts I, II Questionnaire. The competencies role (staff nurse), setting (coronary care unit) and level of practice (entry). Use additional pages for your responses as deemed necessary.

1. What additional competencies listed in Parts I & II beyond basic nursing preparation must the nurse at the beginning level of practice possess in order to provide the coronary critical care patient with safe nursing care?

## DEFINITION OF TERMS

The terms used in this study have been defined by the investigator as follows.

**Coronary critical care unit:** A specifically designated area within a hospital that contains specialized equipment and is staffed to meet the anticipated needs of patients immediately following an acute, impending or suspected coronary heart attack. The purpose of the unit is to provide continuous assessment of patients through a unique combination of direct observation and cardiac monitoring in order to anticipate, identify, prevent and treat patient problems as they become evident.

**Coronary care nurse:** A license registered nurse who is prepared to give direct care to patients following an acute, impending, or suspected coronary heart disease. The individual is committed to ensuring that the coronary care patient receives optimal care.

**Critical care clinical nurse specialist educator:** A registered nurse educationally prepared with a masters degree in nursing who has had coronary care experience, training and acts as a liaison and consultant to the coronary critical care nurse. In some medical facilities this person may be called clinical cardiac nurse specialist or critical care nurse instructor.

**Coronary care nurse practice:** A dynamic process in which the scope is defined in terms of the critically ill coronary patient, the coronary care nurse, and the environment in which coronary care nursing is delivered. All three components are essential and integral elements for the practice of coronary care nursing.

**Competency based education:** A system that emphasizes a learners ability to demonstrate the proficiencies that are of utmost importance to a given task, activity or career. This system ensures that the learner can perform the task that is required in the role.

**Cognitive skill:** The ability to function intellectually by utilizing ones thought processes to think critically and logically in a life threatening situation. It is having the human capacity to integrate sensory stimuli in an environment of loud noises, alarms and bright lights.

**Technical skill:** The mechanistic ability to perform in

an environment with life saving equipment.

**Microshock hazard:** Electrical leakage from equipment in the patient's environment that is potentially dangerous to the patient and staff.

**Orientation:** A period of introduction and adjustment to a coronary care unit for the beginning practitioner in coronary care nursing.

**Traditional education:** A system that emphasizes what a learner should know at the end of an educational program.

## Appendix C

**JESSYE D. SPENCER, M.Ed., BSN  
P.O. BOX 484  
BEDFORD, MASSACHUSETTS 01730**

Dear

Thank you for your response given in Round One. We are now ready for Round Two. It was gratifying to see the results were unanimous in many instances.

I appreciate you assisting me in this exciting study and I believe we will be proud of the beneficial impact the study will have for the future.

I have included a copy of the results from Round One Parts I, II, and III. Part III (the broad open ended question) generated many additional competencies which were formulated to be learner oriented, behaviorally described and measurable.

Enclosed is a copy of the instructions and other informational material for Round Two. After completing Round Two please return the entire packet to me. The results of Round Two will be tabulated and sent to you for validation in Round Three. Please note the definition of beginning level coronary care nurse resulting as a suggestion by one of the panel members.

You may reach me at (617) 275-7500 ext. 232 during the day and/or call collect at (617) 275-5615 after 6:00 P.M.

I look forward to your response by March 30, 1992.

Sincerely,

JESSYE D. SPENCER

**Enclosures:**

Background Information of Study  
Procedure: Rounds One, Two and Three  
Instructions  
Round Two Questionnaire  
Definition of Terms  
Responses from Round One

**COMPETENCIES NEEDED FOR THE BEGINNING LEVEL CORONARY  
CRITICAL CARE NURSES: A DELPHI STUDY**

**BACKGROUND INFORMATION**

Coronary critical care nurses require competencies beyond basic nursing preparation, which are usually provided through inservice training as part of the orientation to the coronary car unit at a hospital. Continuing advances in procedures, technologies, and pharmaceutical interventions mandate that these competencies be updated and clearly specified.

The purpose of this study is to identify the competencies beyond basic nursing preparation that the nurse at the beginning level of practice must possess in order to provide the coronary critical care patient with safe nursing care. The study will assist in developing new strategies and reevaluating current approaches that are critically needed for safe patient care. This study elicits the perspectives of experts in coronary critical care about the essential cognitive and technical skills required of nurses practicing in coronary care units.

A modified Delphi Technique will be used to obtain this information. Three rounds will be used to elicit your perspective as one of fifteen clinical nurse specialists with masters degree in nursing who are practicing in a coronary critical;1 care unit in the northeast. This will aid nursing educators in planning a program in health settings to assure that nurses who practice in a coronary care unit have the specialized knowledge and skills needed to provide safe quality care.

**PROCEDURE****ROUND ONE**

Round One sought your perspective as an important member of the panel which consist of fifteen clinical nurse specialists with two years of experience in a critical care unit and who are currently practicing in a coronary critical care unit. The respondent panel members were asked to answer questionnaire Parts I, II, and III. Your responses were tabulated and all responses were used in Round Two. Each participant remains anonymous.

**ROUND TWO**

This package constitutes Round Two. Round Two seeks consensus. The responses taken from Round One were categorized as domains and competencies. Domain refers to the general knowledge areas and the competencies related to required skills of the beginning level coronary care nurses. The competency statements are intended to be learner oriented, behaviorally described, and measurable. The competency statements prepared from your responses are returned for your evaluation. You are asked to rewrite any competency statement that you disagree with.

**ROUND THREE**

Round Three seeks your approval. You will receive categorized responses from Round Two for validation purposes.

**ROUND TWO INSTRUCTIONS**

Enclosed please find the material for Round Two which was generated by your responses in Round One. A summary of the results from Round One is included for your review.

The competency statements prepared from your responses in Round One were categorized as domain and competencies relating to required skills of the beginning level coronary care nurses. Please review and evaluate each competency statement using the following criteria: learner oriented, behaviorally described, and measurable.

You are asked to indicate whether you agree or disagree with each listed competency statement. In the space provided, rewrite any domain or competency statement that you disagree with and give your rationale for the change. Specific directions are included at the beginning of the instrument.

**DEFINITION OF TERMS**

The terms used in this study have been defined by the investigator as follows.

**Coronary critical care unit:** A specifically designated area within a hospital that contains specialized equipment and is staffed to meet the anticipated needs of patients immediately following an acute, impending or suspected coronary heart attack. The purpose of the unit is to provide continuous assessment of patients through a unique combination of direct observation and cardiac monitoring in order to anticipate, identify, prevent and treat patient problems as they become evident.

**Beginning level coronary care nurse:** A license registered nurse who is prepared to give direct care to patients following an acute, impending, or suspected coronary heart disease. The nurse should have demonstrated successful experience on a medical unit and may require up to three months of orientation with assistance. The individual is committed to ensuring that the coronary care patient receives optimal care.

**Critical care clinical cardiac nurse specialist educator:** A registered nurse educationally prepared with a masters degree in nursing who has had coronary care experience, training and acts as a liaison and consultant to the coronary critical care nurse. In some medical facilities this person may be called clinical cardiac nurse specialist or critical care nurse instructor.

**Coronary care nurse practice:** A dynamic process in which the scope is defined in terms of the critically ill coronary patient, the coronary care nurse, and the environment in which coronary care nursing is delivered. All three components are essential and integral elements for the practice of coronary care nursing.

**Competency based education:** A system that emphasizes a learners ability to demonstrate the proficiencies that are of utmost importance to a given task, activity or career. This system ensures that the learner can perform the task that is required in the role.

**Cognitive skill:** The ability to function intellectually by utilizing ones thought processes to think critically and logically in a life threatening situation. It is having the human capacity to integrate sensory stimuli in an environment of loud noises, alarms and bright lights.

**Technical skill:** The mechanistic ability to perform in an environment with life saving equipment.

**Microshock hazard:** Electrical leakage from equipment in the patient's environment that is potentially dangerous to the patient and staff.

**Orientation:** A period of introduction and adjustment to a coronary care unit for the beginning practitioner in coronary care nursing.

**Traditional education:** A system that emphasizes what a learner should know at the end of an educational program.

**ROUND TWO - APPENDIX C**  
**DOMAINS AND COMPETENCY STATEMENTS GENERATED THROUGH ROUND I**  
**PARTS I, II AND III**

**ROUND II**

**DIRECTIONS:** Read the following 8 domains and 56 competency statements carefully and evaluate each competency statement using the following criteria: learner oriented, behaviorally described and measurable.

Circle Y (Yes) under either agree or disagree with the competency statement using the above criteria.

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS</u>	<u>AGREE</u>	<u>DISAGREE</u>
1. Diagnostic and monitoring functions	*a. Assess pain on a 1-10 scale factor that increase/decrease as demonstrated in ascending order.	Y	Y
	b. Perform a thorough physical assessment of cardiac, pulmonary, neurologic, G.I. renal systems which includes inspection, palpation and auscultation.	Y	Y
	c. Communicate assessment data to members of the health team and document according to policy and procedure.	Y	Y
	*d. Assess physiologic changes indicative of decreased tissue perfusion.	Y	Y
	*e. Implement medical plan for signs indicative of decreased tissue perfusion.	Y	Y
	f. Recognize all life threatening dysrhythmias.	Y	Y
	*g. Implement medical plan for life threatening dysrhythmias.	Y	Y
	h. Analyze basic cardiac rhythms and assess effects upon patient.	Y	Y
	*i. Recognize indications for defibrillation.	Y	Y

\*Consensus reached in Round One

DOMAIN	COMPETENCY STATEMENTS	AGREE	DISAGREE
1. Diagnostic and monitoring functions (con't)	j. Assess psychological signs of depression, anxiety, fear and denial.	Y	Y
	k. Recognize the subsequent signs and symptoms of the pathophysiology of coronary heart disease.	Y	Y
	l. Identify types of MI with respect to cardiac location and expected/potential hemodynamics consequences/ complications of each type.	Y	Y
	m. Identify major cardiac enzymes and isoenzymes changes associated with MI.	Y	Y
	n. Recognize risk factors associated with: Myocardial Infarction	Y	Y
	o. Assess capillary refill and measure in seconds.	Y	Y
	p. Assess for presence and degree of increased jugular venous pressure.	Y	Y
	q. Determine the hemodynamic consequences after recognizing the dysrhythmia and the patient's tolerance of the dysrhythmia.	Y	Y
2. Effective management of rapidly changing situation	a. Perform the procedure safely for defibrillation in an emergency.	Y	Y

<b>DOMAIN</b>		<b>COMPETENCY STATEMENTS</b>		<b>AGREE</b>		<b>DISAGREE</b>
2. Effective management of rapidly changing situation (con't)		b. Perform in extreme life threatening emergencies as demonstrated by problem identification. Rapidly implement medical and/or nursing plan(s) with assistance.		Y		Y
		c. Identify and manage a patient crisis with assistance until the physician arrives.		Y		Y
3. Administering and monitoring therapeutics interventions		a. Perform the procedure for 12 lead EKG.		Y		Y
		b. Select EKG monitoring lead to optimize P-wave morphology.		Y		Y
		c. Monitor electrocardiographic changes associated with each type of MI.		Y		Y
		d. Revise priorities based upon changes in patient status.		Y		Y
		e. Utilize appropriate infection control measures.		Y		Y
		f. Monitor for indications and contraindications in thrombolytic therapy.		Y		Y
		g. Assess physiologic changes indicative of complications following thrombolytic therapy.		Y		Y
	h. Assess physiologic changes indicative of reocclusion and reinfarction.		Y		Y	
	i. Provide safe comprehensive nursing care to patients requiring a temporary pacemaker and following pacemaker insertion.		Y		Y	

<u>DOMAIN</u>		<u>COMPETENCY STATEMENTS</u>		<u>AGREE</u>		<u>DISAGREE</u>
4. Assistive role		a. Include client in planning his/her care.		Y		Y
		b. Establish mutual goals with patient to enhance recovery.		Y		Y
		c. Allow patient/family participation and enable patient to internalize the locus of control.		Y		Y
		d. Utilize other administrative services to support patient care.		Y		Y
		e. Provide time for family members to express their feelings and concerns relating to patient illness.		Y		Y
		f. Provide comfort measures.		Y		Y
5. Teaching coaching function		a. Recognize patient knowledge deficit regarding condition, procedures, equipment, future impact of heart disease on life style and implement nursing care plan.		Y		Y
		b. Utilize various teaching strategies with patient and family.		Y		Y
6. Monitoring and ensuring safe nursing care.		a. Interpret and document the physiological assessment data that reflect pertinent trends in the patient condition.		Y		Y
		b. Recognize the signs and symptoms of M.I. Complications.		Y		Y
		c. Correctly identify pressure wave forms with assistance.		Y		Y

DOMAIN	COMPETENCY STATEMENTS	AGREE	DISAGREE
6. Monitoring and ensuring safe nursing care (con't)	d. Monitor and interpret central venous pressure changes, SV02 data and adjust vaso-active drips accordingly.	Y	Y
	e. Assess PA catheter pressure wave form quality to determine elevated or decreased pressure values.	Y	Y
	f. Communicate assessment data to members of the team.	Y	Y
	*g. Perform hemodynamic monitoring techniques according to hospital policy and procedures.	Y	Y
	h. Demonstrate baseline ability to manage bedside equipment utilized for patients.	Y	Y
	i. Recognize hazards to patient safety and take appropriate action to maintain a safe environment and to give patient feeling of being safe.	Y	Y
	*j. Implement medical plan for descriptive chest pain.	Y	Y
	k. Meet nursing practice standards related to care of the patient who requires suctioning procedures.	Y	Y
7. Surveillance of mechanical ventilation.	a. Identify nursing actions for malfunctioning or failure of the ventilator.	Y	Y
	*b. Identify methods of weaning and nursing observation indicative of successful/unsuccessful weaning.	Y	Y

\*Consensus reached in Round One

<b>DOMAIN</b>		<b>COMPETENCY STATEMENTS</b>		<b>AGREE</b>		<b>DISAGREE</b>
7. Surveillance of mechanical ventilation (con't)		*c. Respond appropriately to sounding of specific ventilator setting alarms.		Y		Y
		d. Assess tolerance to modes and identify readiness to wean.		Y		Y
8. Managing Computerized Data		a. Access continuous monitored cardiovascular parameters to determine nursing priorities.		Y		Y
		b. Access the information relative to the diagnosis and therapeutic regime such as drug doses, physiologic shunt, indices etc. to make appropriate decision(s).		Y		Y
		c. Access computer decision aids initiate appropriate therapeutic regime.		Y		Y
		d. Document pertinent information relevant to the patient's condition to promote data integration and consistency.		Y		Y
		e. Identify the data needed for clinical practice.		Y		Y

\*Consensus reached  
in Round One

## Appendix D

**JESSYE D. SPENCER, M.Ed., BSN  
P.O. BOX 484  
BEDFORD, MASSACHUSETTS 01730**

Dear Ms.

Thank you for your responses given in Rounds One and Two. We are now ready for the final Round, Three. It was gratifying to get the excellent feedback and I found it to be informative and enlightening. Your commitment to this project is commendable.

The results of Round Two have been tabulated and I am now returning it to you for validation. On Round Three Questionnaire, I have included Round Two competency statements to the left of Round Three competency statements for your perusal and review. Your responses generated additional domains, competencies, deleted and/or combined some competencies. It is extremely helpful to me in making decision regarding the changes, modification, and/or deletion when you provide a rationale for such. Included is a copy of the results from Round Two. You may keep this copy.

Enclosed is a copy of the instructions and other informational material for Round Three. After completing Round Three, please return the entire packet to me.

**Please note the definition of beginning level coronary care nurse resulting as a suggestion by one of the panel members.**

You may reach me at (617) 275-7500 ext. 232 during the day and/or call collect at (617) 275-5615 after 6:00 P.M.

I look forward to your response by June 26, 1992.

Sincerely,

JESSYE D. SPENCER, M.Ed., BSN

Enclosures:

Procedures: Round One, Two and Three  
Instructions  
Round Three Questionnaire for Validation  
Definition of Terms  
Responses from Round Two

**PROCEDURE****ROUND ONE**

Round One sought your perspective as an important member of the panel consisting of fifteen clinical nurse specialists with two years of experience in a critical care unit and who are currently practicing in a coronary critical care unit. The respondent panel members were asked to answer questionnaire Parts I, II, and III. Your responses were tabulated and all responses were used in Round Two. Each participant remains anonymous.

**ROUND TWO**

Round Two sought consensus. The responses taken from Round One were categorized as domains and competencies. Domain refers to the general knowledge areas and the competencies related to required skills of the beginning level coronary care nurses. The competency statements were intended to be learner oriented, behaviorally described, and measurable. The competency statements prepared from your responses were returned for your evaluation. You were asked to rewrite any competency statement that you disagreed with.

**ROUND THREE**

**This package constitutes Round Three.** Round Three seeks your approval. You are receiving categorized responses from Round Two for validation purposes. You are requested to confirm the statement or react to those you disagree with.

**ROUND THREE INSTRUCTIONS**

Enclosed please find the material for Round Three which was generated by your responses in Round Two. One Round Three Questionnaire I have included Round Two competency statements for your perusal and review. Your responses generated additional domains and competency statements.

The competency statements prepared from your responses in Round Two were restructured according to your suggestions. A summary of the results from Round Two are included for your review.

You are asked to indicate whether you agree or disagree with each listed competency statement. In the space provided, rewrite any domain or competency statement that you disagree with and give your rationale for the change. When suggesting modification, deletion or combination of competencies, it is extremely helpful to me for a rationale to be given. Specific directions are included at the beginning of the instrument.

**COMPETENCIES NEEDED FOR THE BEGINNING LEVEL CORONARY  
CRITICAL CARE NURSES: A DELPHI STUDY**

**BACKGROUND INFORMATION**

Coronary critical care nurses require competencies beyond basic nursing preparation, which are usually provided through inservice training as part of the orientation to the coronary care unit at a hospital. Continuing advances in procedures, technologies, and pharmaceutical interventions mandate that these competencies be updated and clearly specified.

The purpose of this study is to identify the competencies beyond basic nursing preparation that the nurse at the beginning level of practice must possess in order to provide the coronary critical care patient with safe nursing care. The study will assist in developing new strategies and reevaluating current approaches that are critically needed for safe patient care. This study elicits the perspectives of experts in coronary critical care about the essential cognitive and technical skills required of nurses practicing in coronary care units.

A modified Delphi Technique will be used to obtain this information. Three rounds will be used to elicit your perspective as one of fifteen clinical nurse specialists with masters degree in nursing who are practicing in a coronary critical care unit in the northeast. This will aid nursing educators in planning a program in health settings to assure that nurses who practice in a coronary care unit have the specificized knowledge and skills needed to provide safe quality care.

**PROCEDURE****ROUND ONE**

Round One sought your perspective as an important member of the panel consist of fifteen clinical nurse specialists with two years of experience in a critical care unit and who are currently practicing in a coronary critical care unit. The respondent panel members were asked to answer questionnaire Parts I, II, and III. Your responses were tabulated and all responses were used in Round Two. Each participant remains anonymous.

**ROUND TWO**

**This package constitutes Round Two.** Round Two sought consensus. The responses taken from Round One were categorized as domains and competencies. Domain refers to the general knowledge areas and the competencies related to required skills of the beginning level coronary care nurses. The competency statements are intended to be learner oriented, behaviorally described, and measurable. The competency statements prepared from your responses were returned for your evaluation. You were asked to rewrite any competency statement that you disagreed with.

**ROUND THREE**

Round Three seeks your approval. You will receive categorized responses from Round Two for validation purposes.

**ROUND TWO INSTRUCTIONS**

Enclosed please find the material for Round Two which was generated by your responses in Round One. A summary of the results from Round One is included for your review.

The competency statements prepared from your responses in Round One were categorized as domain and competencies relating to required skills of the beginning level coronary care nurses. Please review and evaluate each competency statement using the following criteria: learner oriented, behaviorally described, and measurable.

You are asked to indicate whether you agree or disagree with each listed competency statement. In the space provided, rewrite any domain or competency statement that you disagree with and give your rationale for the change. Specific directions are included at the beginning of the instrument.

**DEFINITION OF TERMS**

The terms used in this study have been defined by the investigator as follows:

**Coronary critical care unit:** A specifically designated area within a hospital that contains specialized equipment and is staffed to meet the anticipated needs of patients immediately following an acute, impending or suspected coronary heart attack. The purpose of the unit is to provide continuous assessment of patients through a unique combination of direct observation and cardiac monitoring in order to anticipate, identify, prevent and treat patient problems as they become evident.

**Beginning level coronary care nurse:** A license registered nurse who is prepared to give direct care to patients following an acute, impending, or suspected coronary heart disease. The nurse should have demonstrated successful experience on a medical unit and may require up to three months or orientation with assistance. The individual is committed to ensuring that the coronary care patient receives optimal care.

**Critical care clinical cardiac nurse specialist educator:** A registered nurse educationally prepared with a masters degree in nursing who has had coronary care

experience, training and acts as a liaison and consultant to the coronary critical care nurse. In some medical facilities this person may be called clinical cardiac nurse specialist or critical care nurse instructor.

**Coronary care nurse practice:** A dynamic process in which the scope is defined in terms of the critically ill coronary patient, the coronary care nurse, and the environment in which coronary care nursing is delivered. All three components are essential and integral elements for the practice of coronary care nursing.

**Competency based education:** A system that emphasizes a learner's ability to demonstrate the proficiencies that are of utmost importance to a given task, activity or career. This system ensures that the learner can perform the task that is required in the role.

**Cognitive skills:** The ability to function intellectually by utilizing ones thought processes to think critically and logically in a life threatening situation. It is having the human capacity to integrate sensory stimuli in an environment of loud noises, alarms and bright lights.

**Technical skill:** The mechanistic ability to perform in an environment with life saving equipment.

**Microshock hazard:** Electrical leakage from

equipment in the patient's environment that is potentially dangerous to the patient and staff.

**Orientation:** A period of introduction and adjustment to a coronary care unit for the beginning practitioner in coronary care nursing.

**Traditional education:** A system that emphasizes what a learner should know at the end of an educational program.

**ROUND THREE QUESTIONNAIRE**  
**DOMAINS AND COMPETENCY STATEMENTS GENERATED AND EVALUATED THROUGH ROUND II**

**ROUND III**

**DIRECTIONS:** To the left of Round Three Competency Statements are the Competency Statements generated for Round Two for your perusal and review. Read the following domains and Round Three competency statements carefully and **validate** each competency statement using the following criteria: learner oriented, behaviorally described and measurable.

Circle Y (Yes) under either agree or disagree with the Round Three competency statement using the above criteria.

<b><u>DOMAIN</u></b>	<b><u>COMPETENCY STATEMENTS ROUND TWO</u></b>	<b><u>COMPETENCY STATEMENTS ROUND THREE</u></b>	<b><u>AGREE</u></b>	<b><u>DISAGREE</u></b>
1. Diagnostic and monitoring functions	a. Assess chest pain on a 1-10 scale factor that increase/decrease as demonstrated in ascending order.	a. Assess chest pain on a 1-10 scale with one as least and 10 as greatest pain intensity.	Y	Y
	b. Perform a thorough physical assessment of cardiac, pulmonary, neurologic, G.I. renal systems which includes inspection, palpation and auscultation.	b. Perform a physical assessment of cardiac pulmonary, neurologic, G.I. renal systems which includes inspection, palpation, auscultation with assistance for 3-6 months.	Y	Y
	c. Communicate assessment data to members of the health team and document according to policy and procedure.	c. Communicate assessment finding/data to members of the health care team.	Y	Y
		d. Document assessment finding/data according to policy and procedure.	Y	Y

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS ROUND TWO</u>	<u>COMPETENCY STATEMENTS ROUND THREE</u>	<u>AGREE</u>	<u>DISAGREE</u>
1. Diagnostic and monitoring functions (con't)	d. Assess physiologic changes indicative of decreased tissue perfusion.	**e. Assess for physiologic changes indicative of decreased tissue perfusion.	Y	Y
	e. Implement medical plan for signs indicative of decreased tissue perfusion.	f. Implement prescribed therapies for signs indicative of decreased tissue perfusion.	Y	Y
	f. Recognize the subsequent signs and symptoms of the pathophysiology of coronary heart disease.	g. Recognize signs and symptoms of pathophysiologic changes which occurs in coronary heart disease. ie: fatigue, dyspnea, chest pain on exertion, edema, rales etc.	Y	Y
	*g. Recognize the subsequent signs and symptoms of the pathophysiology of coronary heart disease.	**h. Recognize all life threatening dysrhythmia.	Y	Y
	h. Implement medical plan for life threatening dysrhythmia.	i. Implement prescribed therapies for life threatening dysrhythmia.	Y	Y
	i. Analyze basic cardiac rhythms and assess effects upon patients.	j. Assess dysrhythmia for physiologic effects upon patients.	Y	Y
	*j. Recognize indications for defibrillation.	**k. Recognize indications for defibrillation.	Y	Y

\*Consensus reached in Round One

\*\*Consensus reached in Round Two

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS ROUND TWO</u>	<u>COMPETENCY STATEMENTS ROUND THREE</u>	<u>AGREE</u>	<u>DISAGREE</u>
1. Diagnostic and monitoring functions (con't)	k. Assess physiological signs of depression, anxiety, fear and denial.	l. Assess for psychological signs of depression, anxiety, fear and denial with assistance for 3 months.	Y	Y
	*l. Identify type of MI with respect to cardiac location and expected/potential hemodynamics consequence/complications of each type.	**m. Identify type of MI with respect to cardiac location and expected/potential hemodynamics consequences/complications of each type.	Y	Y
	m. Identify major cardiac enzymes and isoenzymes changes associated with MI.	n. Identify cardiac enzymes and isoenzymes changes associated with MI.	Y	Y
	*n. Recognize risk factors associated with: Myocardial Infarction	**o. Recognize risk factors associated with Myocardial Infarction	Y	Y
	o. Assess capillary refill and measure in seconds.	p. Assess for capillary refill.	Y	Y
	p. Assess for presence and degrees of increased jugular venous pressure.	q. Assess for amount of jugular venous pressure.	Y	Y
	q. Determine the hemodynamic consequences after recognizing the dysrhythmia and the patient's tolerance of the dysrhythmia.			

\*Consensus reached in Round One

\*\*Consensus reached in Round Two

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS ROUND TWO</u>	<u>COMPETENCY STATEMENTS ROUND THREE</u>	<u>AGREE</u>	<u>DISAGREE</u>
2. Effective management of rapidly changing situation	a. Perform the procedure safely and defibrillation in an emergency.	a. Perform the defibrillation procedure as per hospital policy and procedure.	Y	Y
	b. Perform in extreme life threatening emergencies as demonstrated by problem identification. Rapidly implement medical and/or nursing plan(s) with assistance.	b. Intervene by problem identification in life threatening emergencies with assistance for 3 months.	Y	Y
	c. Identify and manage a patient crisis with assistance until the physician arrives.			
3. Administering and monitoring therapeutics interventions	a. Perform the procedure for 12 lead EKG.	a. Perform the procedure for 12 lead EKG in the absence of EKG technician.	Y	Y
	b. Select EKG monitoring lead to optimize P-wave morphology.	b. Select EKG monitoring lead to optimize P-wave morphology with assistance for 3 months.	Y	Y
		c. Select EKG monitoring lead to optimize R-wave morphology with assistance for 3 months.	Y	Y
	c. Monitor electrocardiographic changes associated with each type of MI.	d. Monitoring electrocardiographic changes associated with each type of MI with assistance in for 3 months.	Y	Y
	d. Revise priorities based upon changes in patient status.	e. Revise nursing care priorities based upon changes in patient status.	Y	Y

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS ROUND TWO</u>	<u>COMPETENCY STATEMENTS ROUND THREE</u>	<u>AGREE</u>	<u>DISAGREE</u>
3. Administering and monitoring therapeutics interventions (con't)	e. Utilize appropriate infection control measures.	f. Utilize infection control measures in patient situations as defined in hospital infection control policy manual.	Y	Y
	f. Monitor for indications and contraindications in thrombolytic therapy.	g. Monitor for indications in thrombolytic therapy.	Y	Y
		h. Monitor for contraindications in thrombolytic therapy.	Y	Y
		i. Administer thrombolytic therapy according to prescribed interventions.	Y	Y
	g. Assess physiologic changes indicative of complications following thrombolytic therapy.	j. Assess for physiologic changes indicative of complications following thrombolytic therapy.	Y	Y
	h. Assess physiologic changes indicative of reocclusion and reinfarction.	k. Assess for physiologic changes indicative of reocclusion and reinfarction.	Y	Y
4. Monitoring and ensuring safe care of the Temporary Pacemaker Patients	i. Provide safe comprehensive nursing care to patients requiring a temporary pacemaker and following pacemaker insertion.	a. Perform skills specific to a temporary pacemaker including attachment of catheter to generator system.	Y	Y

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS ROUND TWO</u>	<u>COMPETENCY STATEMENTS ROUND THREE</u>	<u>AGREE</u>	<u>DISAGREE</u>
4. Monitoring and ensuring safe care of the Temporary Pacemaker Patients (con't)		b. Perform sensitivity and stimulation threshold checks.	Y	Y
		c. Assess for capture and sensing.	Y	Y
		d. Change pacemaker battery.	Y	Y
		e. Troubleshoot for undersensing and oversensing.	Y	Y
		f. Troubleshoot for failure to pace.	Y	Y
		g. Troubleshoot for failure to capture.	Y	Y
	5. Assistive role	a. Include client in planning his/her care.	a. Establish short and long term goals with patient/and significant other to enhance recovery and/or maintain the quality of life.	Y
b. Establish mutual goals with patient to enhance recovery.				
c. Allow patient/family participant and enable patient to internalize the locus of control.		b. Assist patient/family in participating with care.	Y	Y
**d. Utilize other administrative services to support patient care.		**c. Utilize other administrative services to support patient care.	Y	Y

\*\*Consensus reached in Round Two

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS ROUND TWO</u>	<u>COMPETENCY STATEMENTS ROUND THREE</u>	<u>AGREE</u>	<u>DISAGREE</u>
5. Assistive role (con't)	e. Provide time for family members to express their feelings and concerns relating to patient illness.	e. Provide time for family members to express their feelings and concerns relating to patient illness with assistance for 3 months.	Y	Y
	*f. Provide comfort measures.	e. Provide comfort measures specific to activity, limitation, pain control and medication side effects.	Y	Y
6. Teaching coaching function	a. Recognize patient knowledge deficit regarding condition, procedures, equipment, future impact of heart disease on life style and implement nursing care plan.	a. Recognize patient knowledge regarding condition, procedures, equipment and implement nursing care plan.	Y	Y
	b. Utilize various teaching strategies with patient and family.	b. Implement teaching plans as per assessed patient/significant other learning needs and pre-existing teaching program.	Y	Y
7. Monitoring and ensuring safe nursing care.	a. Interpret and document the physiological assessment data that reflect pertinent trends in the patient condition.	a. Interpret the physiological assessment data that reflect current patient condition and developing trends.	Y	Y
	b. Correctly identify pressure wave forms with assistance.  (Combined in item 7.c)	b. Document physiological data as per policy and procedure.	Y	Y

\*Consensus reached in Round One

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS ROUND TWO</u>	<u>COMPETENCY STATEMENTS ROUND THREE</u>	<u>AGREE</u>	<u>DISAGREE</u>
7. Monitoring and ensuring safe nursing care (con't)	c. Assess PA catheter pressure wave form quality to determine elevated or decreased pressure values.	c. Assess PA, CVP and arterial pressure wave forms as to catheter location, wave form quality and normal/abnormal values with assistance for 3 months.	Y	Y
	e. Monitor and interpret central venous pressure changes, SV02 data and adjust vasoactive drips accordingly.	d. Titrate prescribed vasoactive and inotropic infusions as to changes in arterial pressure and SV02 values with assistance for 3 months.	Y	Y
	f. Communicate assessment data to members of the team.	e. Communicate assessment data to members of the health care team.	Y	Y
	*g. Perform hemodynamic monitoring techniques according to hospital policy and procedures.	**f. Perform hemodynamic monitoring according to hospital policy and procedure.	Y	Y
	h. Demonstrate baseline ability to manage bedside equipment utilized for patients.	g. Perform procedures utilized for patients that are specific to bedside equipment on patient attachment, equipment set-up, patient monitoring and equipment troubleshooting.	Y	Y

\*Consensus reached in Round One

\*\*Consensus reached in Round Two

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS ROUND TWO</u>	<u>COMPETENCY STATEMENTS ROUND THREE</u>	<u>AGREE</u>	<u>DISAGREE</u>
7. Monitoring and ensuring safe nursing care (con't)	i. Recognize hazard to patient safety and take appropriate action to maintain a safe environment and to give patient a feeling of being safe.	h. Recognize hazards to patient safety.	Y	Y
		i. Implement procedures to assure safe patient environment according to hospital safety manual.	Y	Y
	j. Implement medical plan for descriptive chest pain.	j. Implement therapeutic procedures for descriptive chest pain as per standing or written order.	Y	Y
	*k. Meet nursing practice standards related to care of the patient who requires suctioning procedures.	k. Perform airway suctioning as per standards of care and procedures.		
8. Surveillance of mechanical ventilation	a. Identify nursing actions for malfunctioning or failure of the ventilator.	a. Identify malfunctioning or failure of the ventilator.	Y	Y
	*b. Identify methods of weaning and nursing observation indicative of successful/unsuccessful weaning.	**c. Identify methods of weaning and nursing observation indicative of successful/unsuccessful weaning.	Y	Y
	*c. Respond appropriately to sounding of specific ventilator setting alarms.	**d. Respond appropriately to sounding of specific ventilator setting alarms.	Y	Y

\*Consensus reached in Round One

\*\*Consensus reached in Round Two

<u>DOMAIN</u>	<u>COMPETENCY STATEMENTS ROUND TWO</u>	<u>COMPETENCY STATEMENTS ROUND THREE</u>	<u>AGREE</u>	<u>DISAGREE</u>
8. Surveillance of mechanical ventilation (con't)	d. Assess tolerance to modes and identify readiness to wean.	e. Assess patient's response to ventilator modes and identify readiness to wean with assistance for 3-6 months.	Y	Y
9. Managing Computerized Data	a. Access continuous monitored cardiovascular parameters to determine nursing priorities.	a. Access hemodynamic data related to cardiac output, pre-load, afterload and contractility.	Y	Y
	b. Access the information relative to the diagnosis and therapeutic regime such as drug doses, physiologic shunt, indices, etc. to make appropriate decision.  (combined with item 9.a)	**c. Access computer decision aids to initiate appropriate therapeutic regime.	Y	Y
	d. Document pertinent information relevant to the patients's condition to promote data integration and consistency.	d. Document validated computerized data related to cardiovascular status as per unit policy.	Y	Y
	e. Identify the data needed for clinical priorities.  (Deleted, combined in item 9.a)			

\*\*Consensus reached in Round Two

## Appendix E

















