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# Caring for the Acute Myocardial Infarction Patient: A Nursing Perspective

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*Cardiac nursing is nearly 30 years old. Changes in the role of cardiac nursing have directly corresponded to the three distinct medical phases of care for the acute myocardial infarction patient—arrhythmia detection, pump failure, and limiting infarct size. Nursing care delivery in the cardiac setting, the cardiac patient, and the role of the cardiac nurse each have undergone changes over the years, which together has provided a challenge to health care delivery. Future effects of technological and pharmacologic advances, social changes, and nursing professional practice issues on cardiac care delivery are imperative to consider as health care moves into the 1990s. (Henry Ford Hosp Med J 1991;39:251-5)*

Cardiac nursing will soon be celebrating its 30th anniversary. The first coronary care units began in 1962 with the sole purpose of decreasing in-hospital mortality from acute myocardial infarction (MI). Over time the focus expanded to include the care of patients with a variety of cardiac-related diseases, and the role of nursing in these cardiac units expanded accordingly. Today's units find the nurse in a role integral to the comprehensive care of cardiac patients.

## History

The medical care of cardiac patients has gone through three distinct phases: arrhythmia control, pump failure, and limiting infarct size (1). Nursing roles have followed a similar path.

### Arrhythmia detection

As soon as it became apparent that physicians could not continually observe ECG monitors, the role of the patient guardian fell to the nurse (2). The idea that lethal rhythms were preceded by "warning rhythms" was the basis for the 20 years of "monitor watching" that followed. Depending on the availability of nurses, other members of the support staff were also trained in this function. In the early 1970s, computerized systems for arrhythmia detection became commonplace. Regardless of the details, nurses became the experts at monitoring and emergency treatment which took precedence over many other functions of the day.

### Pump failure

With technological advances in mechanical support, bedside right heart catheterization, and inotropic drug therapy, treatment of pump failure became an art in the 1970s. Nurses in cardiac intensive care units (CICUs) entered the decade of technology. Transducers and intraaortic balloon pumps became the tools of the trade. Suddenly the relatively tube-free cardiac patient be-

came intensively monitored with bedside computers, and staffing and caring for the acutely ill patient became priority issues. Some who had thought cardiac care not to be intensive care (and staffed it as such) had to be convinced of the changes. Complicated multiple-drug titrating, hemodynamic monitoring, and caring for the ventilated patient were added to the CICU nurse's repertoire.

### Limiting infarct size

As a patient's prognosis postinfarction is determined mainly by the extent of damage, modification of infarct size became the third phase of care and the theme of the 1980s (3). Beta-blockade, afterload reduction, and thrombolytic therapy have become the mainstays in preserving myocardial function. Nurses who had become familiar with the digoxin and lasix of the 1960s and the inotropes of the 1970s had to adjust to the subtle differences between pressure versus flow and perfusion that often became an issue with beta-blockade and afterload reduction. The seasoned nurses had to teach this concept to other, less experienced members of the team who had not routinely infused these medication combinations in patients with labile blood pressures, consequently improving the patient's hemodynamic status.

The timely administration of thrombolytic therapy requires not only the patient to seek help early but also the health care team to act quickly in identifying the potential acute MI patient and screening the patient immediately and accurately for absolute and relative contraindications for thrombolytic agents. The Second International Study of Infarct Survival (4) reported a 50% reduction in five-week mortality in patients who received a

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combination of streptokinase and aspirin within 4 hours of the onset of symptoms. In the United States the majority of acute MI patients do not receive thrombolytic therapy because of delays in the recognition of this condition by both physicians and nurses (5,6). Access to the health care system requires a patient to enter the system and the system to respond in a timely manner. In the early 1970s, the median time from onset of symptoms to admission in the CICU was 5 to 6 hours (2). The role of the nurse, particularly the emergency room nurse and the outpatient clinic nurse, is critical in this phase of early recognition of care for the acute MI patient. If the integrity of heart muscle is truly linked to the time between the onset of symptoms and the initiation of therapy, the health care disciplines involved in cardiac care must work to decrease access time as well as address delays in care through both patient and staff education.

### Recent Developments

Approximately 750,000 patients with acute MI were hospitalized in the United States during 1987 (7). The management of these patients consequently represents a large portion of nursing practice. Dramatic changes have occurred in the patients themselves, in the care of the patients, and in the role of the nurse.

#### The patient

The "pure" cardiac patient no longer exists. Patients, similar to the population at large, often present with multisystem problems and a greater degree of chronic illness. Patients on ventilators or peritoneal dialysis are now commonplace whereas they were once considered a rarity or, even worse, "misplaced" (i.e., ready for movement to the medical intensive care unit). The CICU is not a quiet, calm environment but is filled with the multitudinous activity of any intensive care unit. Severity of acute illness has increased. On any given day, the average load of patients can be divided into one-third highly intensive, one-third intermediate, and a middle group that can vacillate in either direction in severity of acute illness. Fluctuations in severity of acute illness provide a challenge to staffing patterns and productivity.

Caring for the aged patient with diminished reserve in combination with an acute MI provides another challenge to care delivery. Approximately one of every eight Americans is 65 years old or older. In addition, approximately one-third of all hospital admissions and 43% of hospital patient care days are provided for this elderly population (8). Interestingly, our patient population does not consistently reflect this aged patient statistic. The average admission age in our CICU was 63 years in 1981 and 60 years in 1991. While we anticipate that caring for the aged, acute MI patient with multisystem failure will largely account for the increase in acutely ill patients and the need for more intensive care beds in the future, we also anticipate that cardiac patients will be younger and consequently endure more years of chronic illness. Caregivers on all levels will be required to have an increased knowledge base as well as to utilize consultative services and social support systems consistently in their delivery of care to the cardiac patient.

#### The care

Health care has become a product line and all care has to be made efficient and realistic to meet "production deadlines." In 1970, the average length of stay for the acute MI patient was 21 days. In 1987, length of stay had decreased to nine days (9). Approved length of stay according to diagnosis-related groups is currently six days for acute MI without complications and nine days for acute MI with complications (10). Because length of stay for the acute MI patient has dramatically decreased, the CICU nurse has identified the need to deliver "condensed care." Early identification of patient and family problems and concerns as well as their educational needs related to the acute MI is essential.

Over the past two decades in particular, nursing care of the cardiac patient has focused on holistic assessment. We agree with Pinneo and Briody (11) that "Biopsychosocial unity is the essence of being human. One cannot fragment the patient and separate the effect of the MI on his sexual needs from his concern over his hospital bill or the implications for his role change within the family structure in the face of illness." The essence of cardiac nursing practice is based on the fundamental belief that the patient is a "whole" person and a member of a "family unit." Early and ongoing collection of patient and family nursing assessment data at Henry Ford Hospital is facilitated by utilizing both a biological systems assessment framework and a functional health patterns framework. The functional health patterns framework is an assessment tool unique to nursing. The framework assists the nurse to organize and collect data regarding actual and/or potential functional disruptions to the patient/family caused by the patient's disease process. Holistic assessment is critical to the timely identification of problems and the delivery of care.

An acute onset of illness, such as an acute MI, frequently causes anxiety for the patient which is related not only to being acutely hospitalized, but to actual pain and discomfort, to the fear of the unknown, and to the fear of death (12,13). A family's needs and concerns are to maintain hope, to have honest and understandable information daily, to see their loved one, and to have questions answered directly (14,15). CICU nurses incorporate such findings into the daily delivery of care to the cardiac patient. Interventions include: 1) flexibility in visiting hours, 2) providing clear direction related to unit protocols, 3) providing an environment conducive to discussion of questions and concerns with the patient and family, 4) daily communication with the patient and family about the expected outcome of care, 5) planned multidisciplinary meetings with the patient and family as needed, and 6) easy access to educational materials (i.e., handouts, classroom discussion, videotapes).

Cardiac nurses have always been active in cardiac rehabilitation and meeting the educational needs of the patient and family. Phase I rehabilitation inpatient goals must be realistic and condensed to those components most needed for patient survival. This information must be efficiently divided over all nursing areas. Before leaving the CICU following an average two-day stay, the patients should: 1) know their diagnosis, 2) understand their activity level, 3) receive a handout describing the warning signs of an acute MI, 4) know to report any cardiac pain or dis-



comfort immediately, and 5) understand that both inpatient and outpatient cardiac rehabilitation classes are available to them and their families. Nursing staff in the telemetry and general practice cardiac care areas identify and discuss with the patient and family additional home-based educational materials and goals for care. This information includes reinforcement of medication education, activity and ambulation prescriptions, and risk factor modification. Between the patient care areas, we strive for continuity of provided information. Setting more lofty educational goals in a six-day length of stay is unrealistic and self-defeating.

Activity levels for the cardiac patient have progressed rapidly over the years. In the 1950s, postinfarction patients were immobilized for six to eight weeks (6). Today, patients are encouraged to use the bedside commode within hours of the acute MI and to walk in the hall by the third or fourth day. Nurses are assisting the patient in self-care and observing for reinfarction risk rather than "doing for" the patient.

"Condensed care" requires careful setting of priorities and treatments. Complications such as arrhythmias, which do not affect outcome or symptoms, are no longer dwelled upon. Studies have failed to demonstrate that the suppression of premature ventricular contractions alters mortality (16). Cardiac nurses are seldom found at the monitors anymore and are more likely to be admitting or discharging patients, performing technical functions, as well as assessing, teaching, counseling, and supporting the patients and their families during the hospital stay. The cardiac nurses' primary goals are to provide safe and comprehensive care in a timely manner, to keep the patient and family informed, and to encourage them in their own health care maintenance.

### The nurse

Collaboration between nurses, physicians, and other health care providers has emerged as a key component of quality patient care delivery. In our present time of high-technological advances, tremendous competition, and dwindling health care dollars, there is an absolute need for health care professionals to support a cooperative effort. Cardiac nurses support the following collaborative efforts in the care of the cardiac patient:

1. Daily multidisciplinary patient care rounds with input from all disciplines regarding the patients' current and future status.
2. Effective response to a cardiac arrest as a team without contemplation of who should carry out which task.
3. Weekly multidisciplinary patient care review meetings addressing specific patient care issues. In our CICU, weekly morbidity and mortality meetings allow us to review specific cases for the educational benefit of all the disciplines.
4. Monthly multidisciplinary practice committee meetings to discuss quality assurance issues and changes and improvement in practice. Our institution's CICU Collaborative Practice Committee is comprised of nurses, physicians, respiratory therapists, pharmacists, and administrators.
5. Quarterly forums to discuss and share practice-related issues. In March 1991, "MAMI" (Management of Acute Myocardial Infarction) was formulated at Henry Ford Hospital by the four nursing staff members and the medical director of the

CICU. MAMI is composed of nurses and physicians from within the entire Henry Ford Health System who impact the care of the cardiac patient in their patient care setting. Our goals for MAMI are communication, collaboration, and education.

6. A multidisciplinary model for care delivery for the acute MI patient. In February 1990, the CICU Collaborative Practice Committee began work to establish a multidisciplinary critical pathway for the acute MI patient. The Committee continues to work toward improvement of the care delivery model.

7. Early multidisciplinary input regarding the identification of long-term and actual and potential discharge needs of the cardiac patient and family as they return home and encounter changes in life-style. In both the CICU and the general practice cardiac units at Henry Ford Hospital, discharge planning meetings are held weekly.

A collaborative team approach means that a collegial relationship exists between the members and that each member of the team has an identified responsibility with direct accountability to the group. A collaborative team approach to patient care delivery aids in establishing a framework for problem-solving and decision-making, for enhancing comprehensive and not fragmented care, and for developing effective communication as colleagues among the health care disciplines.

The CICU nursing staff has its own obstacles to the establishment of collaborative practice. One obstacle relates to an incomplete understanding of the definition of professional nursing practice. At Henry Ford Hospital, through the development of a shared governance structure, the Department of Nursing is changing the way nurses perceive and practice nursing (17). Nurses are actively involved in developing standards of care for specific patient care populations, such as the acute MI patient. Staff nurses are represented on all levels of the governing structure and are encouraged to question and participate in nursing decisions.

Another identified means of facilitating professional nursing practice is through the integration of a professional nursing care delivery model (17). Primary nursing care delivery models and case management care delivery models with critical pathways have been established in various institutions, including Henry Ford Hospital. Each of the models incorporates a focus on the development of patient care-focused outcome standards and process/plan standards as they relate to a specific patient care population, i.e., the acute MI patient. The effectiveness of each delivery system depends on more than just agreeing on mutual goals. Effectiveness relies on the understanding by each of the health care team members of what their contribution must be to achieve the stated outcome in an appropriate and timely manner. In essence, nursing care delivery is now more outcome-driven, with essentials to care identified by the staff nurse who has an integral role in multidisciplinary comprehensive bedside care.

### The future

The nurse caring for the cardiac patient in the 1990s will be challenged and impacted by a multitude of issues, including technological and pharmacologic advances, social issues, and professional nursing practice issues. To match these ongoing



advancements in technology and knowledge, cardiac nurses will face an ever-increasing demand for the delivery of humanistic care.

### Technological advances

Ventricular assist devices play a valuable role in caring for the postcardiotomy patient, the acute MI cardiogenic shock patient, and the patient awaiting cardiac transplant. The number of patients requiring mechanical circulatory assistance is expected to continue to increase in the years to come (18). Cardiac nurses will gain increasing technical skill and expertise, as well as research standards of practice for care delivery for this patient population.

The shortcomings of percutaneous transluminal coronary angioplasty have been well documented and include both acute closure and chronic restenosis of the vessel (19,20). To achieve vessel recanalization, a number of interventional alternatives have evolved. These interventions include lasers, stents, and atherectomy devices (21,22). Nursing care postprocedure will entail both specific collaborative efforts and nursing interventions based on the procedure performed. Specific nursing care remains to be defined and will be a welcome challenge to cardiac nurses.

Early identification and prevention are key concepts in the provision of nursing care to the cardiac patient. Research supports that continuous noninvasive ST segment monitoring is a sensitive marker to the identification of myocardial ischemia in patients with a previous acute MI (23,24). Further study is needed to determine whether continuous ST segment monitoring and early identification of myocardial ischemia in the newly admitted CICU acute MI patient population can be a prognostic indicator of short-term inpatient cardiac events. Collaborative research in continuous ST segment monitoring should provide valuable information relative to the CICU nurse's role in assessing, planning, implementing, and evaluating nursing care for the cardiac patient.

### Pharmacologic advances

Intravenous thrombolytic therapy has become a standard of care for the treatment of the acute MI patient. Both emergency room and CICU nurses have gained considerable expertise in the early identification of the patient to receive thrombolytics, the administration of the medication(s), and the care of the patient posttreatment. The future use of thrombolytic agents will include combination therapies, alternative dosing regimens, broadening selection criteria, changes in adjunctive therapy, and expanding the indications for use (25). Nursing personnel will need to remain knowledgeable in this area as well as implement specific research-based interventions related to this patient population. Most importantly, the roles that both emergency room nurses and cardiac nurses play in the early recognition of the acute MI patient will remain critical to the facilitation of improved patient outcomes.

Cardiac nurses in the various cardiac units have been involved in several drug-related research studies. Some of these research studies include 1) the use of flolan in patients with end-stage heart failure, 2) the Global Utilization of Streptokinase

and t-PA for Occluded Coronary Arteries trial, 3) the use of high-dose magnesium in acute MI patients, 4) the use of digoxin and capoten in end-stage heart failure patients, and 4) the International Study of Intravenous Streptokinase phase 3 trial. Nursing professionals will continue to be involved in collaborative research efforts, including cardiovascular drug research.

### Social issues

The use and abuse of illicit drugs, in particular cocaine, has grown to epidemic proportions in the last decade. In addition, a large population of patients have presented to hospital emergency departments with cardiac problems believed to be related to cocaine use (26). A uniform treatment plan for both the acute and chronic phases of care for the cocaine user have yet to be established. Through research, cardiac nursing will play a key role in identifying optimal care therapies for this new patient care population.

Health care costs in the United States were 11% of the gross national product in 1989. As much as 28% of a person's total health care costs occur in the last 12 months of their life (27). In the United States, 70% believe that the increased costs in health care have not led to an improvement in the quality of health care (28). The general public is beginning to believe that more is not necessarily better. We must begin to make decisions on the cost/benefit of expensive treatments and lengths of stay. The issues linked to cardiac transplantation, i.e., allocation of resources, organ procurement, and recipient selection (29), have initiated many ethical discussions related to cost and benefit. What is the best way to manage the hundreds of end-stage cardiac patients in a time of limited resources? This issue and others will challenge *all* health care disciplines as well as society in the 1990s.

Traditionally, cardiac nurses have provided the patient and family with vast amounts of educational guidance related to risk factor modification, life-style changes, and preventive health measures. The future dictates that these interventions be research-based. Considering the economic and time constraints facing health care today, cardiac nurses must delineate which interventions are most appropriate and effective in assisting the patient and family with a multitude of physiologic and psychosocial adjustments during their hospital stay and upon discharge.

The advent of advanced technology has dramatically prolonged the normal process of death and dying for the hospitalized patient. Limiting care issues have provoked much anxiety both personally and professionally for nurses. CICU nurses, along with other health care disciplines, need to gain insight on issues such as the do-not-resuscitate dilemma, advance directives, living wills, and the implications of withholding and/or withdrawing life support. Nurses must contemplate not only their feelings and perspectives on death and dying but those of the patient and family as well. The patient and family members each bring individual values and needs for human dignity which must be considered in the delivery of care. CICU nurses expect to become increasingly involved as advocates for the patient and family in ethical discussions, decisions, and education.

Morbidity and mortality rates have long been utilized as measures of outcome of interventions. Quality of life measure-



ment in patients with chronic diseases has been studied extensively in the past decade (30). Quality of life must be defined from the patient's perspective of what quality in his or her life means. The patient's *own definition* of the type and quality of life he or she experiences with chronic cardiac disease is an important issue for all disciplines involved in the planning of short- and long-term care to consider in the 1990s. As McCall (31) has recognized, even for patients with chronic disease, "all life has some quality."

### Professional practice issues

Throughout the years, cardiac nurses have made valuable and unique contributions to the comprehensive care of the acute MI patient. The role of the nurse as a facilitator and coordinator of holistic care will continue to grow in the future. As professionals, nurses understand that clear articulation of the key components of their role in health care delivery is vital to continued professional growth.

### Conclusion

Caring for the acute MI patient has evolved through many changes over the past 30 years. Cardiac nursing has kept in stride with the pace of advances from the medical discipline and will be challenged to continue to utilize both the nursing process and the research process in improving nursing practice and care delivery in the future. Nursing professionals are committed to a collaborative effort with medicine and other health care disciplines for the ultimate benefit of the patients and their families.

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