A Stratified System of Coronary Care

A DOCUMENT was published in the May 1971 issue of CIRCULATION (43: A-171) by the Inter-Society Commission for Heart Disease Resources reappraising the optimal care of patients with acute myocardial infarction. The Commission proposed a stratified system of coronary care, which consists of three levels or categories of medical facilities: (1) life support units or stations, (2) coronary care units with adjacent intermediate care units, and (3) Regional Reference Centers. Since the operation of coronary care units (CCU) is now almost a standard component of patient care in all hospitals, and the important aspects of staffing, facilities, and operation are described in detail in this and other documents, no further comments are necessary. On the other hand, the concepts of life support units, intermediate care units, and Regional Reference Centers deserve special consideration.

Because of the very high fatality rate from acute myocardial infarction during the first few hours, the members of the Commission believe that it is imperative to shorten the delay between onset and the availability of optimal coronary care. Both public and professional education are needed. Messages directed to the public should be simple, clear, and direct. The American Heart Association and its affiliates have already alerted the lay public through the use of pamphlets describing effectively the warning signs of heart attack and the measures that should be taken in order to avoid unnecessary delay.

In parallel with intensive public and professional education, mechanisms should be provided for rapid entry of patients into the first level or category of coronary care—life support units—where adequate personnel and facilities are provided for continuous surveil-

lance and monitoring, and for institution of appropriate preventive and therapeutic measures. Patients may enter the life support units through any of the following approaches: their own physicians, information centers, self-referral, or an ambulance. In most cities, transportation of patients to a hospital depends largely on an ambulance service, which ideally should be equipped with monitoring and resuscitative facilities. In other cities or communities, private cars are more convenient and accessible.

Life support units are classified as mobile or fixed. The mobile coronary care unit (MCCU) is an example of a mobile life support unit. The initial cost of these units in several cities was relatively high for several specific reasons: (1) conduct of research projects, (2) staffing with physicians and nurses, (3) installation of highly sophisticated equipment, and (4) underutilization because the units responded to cardiac cases only. The recent operation of mobile intensive care units (MICU) in a number of cities has reduced the cost appreciably by staffing the vehicles with allied health personnel, installing relatively simple and often portable equipment, and insuring more frequent utilization by responding to all emergency calls. A composite analysis of the preliminary data shows that 35% of patients resuscitated were discharged alive from the hospitals. This is an impressive figure. It suggests that if only half the patients in this country who die suddenly outside the hospital could be attended by the MCCU or MICU, a total of 40,000 lives could be saved annually. There is a distinct possibility that the survival rate may be even better than 35% in the near future.

Operation of mobile life support units is feasible and suitable only in a limited number of cities, but fixed life support units may be established in both large and small communities throughout the country. The logical site is the emergency department of a hospital. The emergency area of every hospital should be

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able to provide the life support functions of monitoring patients, instituting appropriate drugs, and carrying out cardiopulmonary resuscitation including defibrillation. In large hospitals, the establishment of a precoronary area (PCA) attached to the emergency department may be useful for the prompt screening, monitoring, and care of patients with suspected or proven acute myocardial infarction. The idea of establishing a PCA is particularly attractive when one considers the competition for the attention of emergency room staff resulting from the needs of patients with fractures, syncope, or febrile illnesses, as well as those with severe chest pain. In many community hospitals where physicians are not available on a 24-hour basis, nurses and allied health personnel will have to assume a greater responsibility for the management of these patients.

Recommendations are also made to consider the establishment of fixed life support units in locations where there is either a constant or periodic concentration of mass population, such as factories, stadiums, and metropolitan airports. These units may serve as satellite precoronary areas with the capability of monitoring and instituting emergency therapeutic measures similar to those of the emergency department of a hospital.

It should be emphasized that the major function of a life support unit is to stabilize the cardiac rhythm of the patient during the early stage of the disease. When the patient’s condition is sufficiently stable, he should be transferred to the CCU of a nearby hospital or a Regional Reference Center.

The establishment of such life support units and the creation of public awareness of them may offer several advantages. First, the availability of readily accessible facilities for cardiac emergency care will undoubtedly encourage many patients with suspected or proven acute myocardial infarction to seek early medical help. Thus, the primary objective of prehospital care of shortening the delay can be partly achieved. Second, an effective program consisting of early and prompt monitoring, institution of appropriate drugs, and cardiopulmonary resuscitation may reduce the high mortality rate and possibly shorten the duration of hospitalization of these patients. Third, diversion of patients to these life support units may relieve the congestion of already overburdened emergency departments.

The members of the Commission have also recommended for consideration that an intermediate care unit be available attached to the CCU in every hospital. This unit is specially designed for the care of patients with proven acute myocardial infarction during the latter part of the first week of illness and probably the entire second week, depending on their condition and stability. Patients transferred from the CCU to this unit usually have either an uncomplicated course or infrequent cardiac arrhythmias. Few may be in mild left ventricular failure. This unit also can be used for any cardiac patients who may benefit from monitoring or resuscitative capability. In some hospitals telemetry may be installed in the unit in order to give the patients more freedom to move about. Although surveillance and monitoring of patients are less intense and constant than in a CCU, facilities should be provided for instituting appropriate drug therapy and cardiopulmonary resuscitation. It would be desirable for the intermediate care unit to be fully integrated and coordinated with the adjacent CCU, sharing nursing and allied health personnel in both units. If a patient’s condition deteriorates or if he develops serious cardiac arrhythmias, he should be promptly transferred back to the CCU for more intense monitoring and therapy. If a patient’s condition is stable after the end of the second week, he may go to an open floor for routine care and be discharged soon thereafter. Statistical data have shown that the incidence of serious complications or unexpected death is relatively low after the end of the second week, provided there is no extension of the original infarct or development of a new myocardial infarction.

The third category of medical facilities for coronary care is provided by the so-called

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Regional Reference Centers, which are appropriate in medical centers, institutions, and large hospitals with adequate personnel, resources, and facilities for all three levels or categories of coronary care. Thus, in addition to their capacity for life support and continuing coronary care, they are fully equipped to carry out more advanced and complicated diagnostic and therapeutic procedures. They are staffed and equipped to receive patients with serious complications such as refractory life-threatening cardiac arrhythmias and conduction defects, severe cardiac failure or cardiogenic shock, perforation of the ventricular septum, or rupture of a papillary muscle. They also have the responsibility and opportunity to (1) develop continuing education and training programs for professional and allied health personnel, and (2) conduct research in acute myocardial infarction and coronary artery disease.

Close coordination and cooperation are essential between the Regional Reference Centers and (1) coronary care units and life support units of adjacent hospitals, and (2) mobile or fixed life support stations in the region or community. Free communication is necessary, and meetings are needed to study the ways and means of expediting patient referrals for immediate care.

Implementation of a most effective stratified system of coronary care in a specific community or region requires careful planning, efficient organization, and coordinated operation by both professional and lay personnel involved. Depending upon the local needs, and existing resources and facilities, one or more levels or categories of medical facilities should be established in a specific community.

From a nationwide point of view, the ultimate goal of optimal care of patients with acute myocardial infarction cannot be achieved unless all three levels or categories of the stratified system of coronary care are effectively and efficiently implemented throughout the country.

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