A BRIEF HISTORY OF CORONARY CARE UNITS

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SPECIALIZED coronary care units are a recent development for hospital treatment and management of patients with acute myocardial infarctions. A concept of the early 1960's, such units have been established with amazing celerity.

Historical Background

The first coronary care area in the United States opened at Bethany Hospital, Kansas City, Kans., in May 1962. Although the earliest published report emanating from the unit did not appear in a professional journal until October 1963 (*1*), the idea had spread rapidly and aroused considerable interest before the article was printed. The coronary care unit at Bethany Hospital was supported primarily by the John A. Hartford Foundation. Later in the year, the Heart Disease Control Program, Public Health Service, provided consultation and token financial assistance.

Beginning in the summer of 1962, the Heart Disease Control Program initiated major efforts toward establishing specialized coronary care units for patients with acute myocardial infarction. It was at that time that the name "coronary care unit" received its impetus as a specialized entity.

Consequently, the Public Health Service awarded a 1-year contract to establish a two-bed coronary care unit at the Presbyterian Hospital in Philadelphia, and the first patients were admitted in January 1963. When the initial contract expired, support of this unit was taken over by the Service's Division of Nursing, which instituted a pilot study of nursing patterns in this new setting.

Impressed by the accomplishments of these first two units, the Heart Disease Control Program requested funds to support additional demonstration-study coronary care units. The purpose of such units was to demonstrate the feasibility of reducing mortality from acute myocardial infarctions by treating patients in specially designed, staffed, and equipped areas in hospitals.

Sufficient funds were obtained to assist in establishing coronary care units at the New York Hospital-Cornell Medical Center, a university-affiliated medical school training hospital in New York City, and Holy Cross Hospital, a community hospital in Silver Spring, Md. The first patients were admitted to these units in January 1965. In 1966, the program assisted in establishing units at St. Joseph's Hospital, Houston, Tex., and the University of Southern California's Los Angeles General Hospital-Medical Center. Patients were first admitted to these units in April and October 1966, respectively.

Establishing Guidelines for Units

Inasmuch as the coronary care unit embodied an entirely new concept for managing patients with acute myocardial infarction, there were no guidelines for establishing one. For this reason, in 1964 the Public Health Service released the booklet, "Coronary Care Units" (*2*). The first printing was exhausted within 60 days of publication, and the booklet has been reprinted six times, an indication of the demand for information about this concept.

Because the armamentaria for coronary care units require special accommodations, the Service's Division of Hospital and Medical Facilities designed and developed special architectural and engineering plans. These drawings were published in a handbook entitled, "A Facility Designed for Coronary Care," (*3*) in 1965. This booklet also has been widely disseminated.

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Between 1962 and 1966, some 250 hospitals established coronary care units specifically for the care of patients with confirmed or suspected acute myocardial infarctions. The majority of these units have been established in community hospitals by using only local funds. In addition, approximately 250 other hospitals organized medical intensive care units with electronic monitoring equipment for one, two, or three patients with cardiac disease.

Concurrent with the establishment of the first 250 units for coronary care, promulgation of this concept was a primary objective of the Heart Disease Control Program. Physicians and nurse consultants on the program's staff participated in seminars and workshops throughout the country, and the program, by gathering data from selected hospitals, served as a clearinghouse for information pertaining to coronary care units.

The Concept

The principle underlying the concept of the coronary care unit is that the ideal site is a "separate area within a hospital specifically designed, equipped, and staffed to meet all anticipated needs of patients with acute myocardial infarction." A unit which meets this criterion can provide for intensive and constant surveillance of a patient, so that effective and adequate emergency treatment can be given promptly.

It is not yet possible, even after about 5 years of experience in some units, to describe precisely the requirements of an ideal unit. However, these seven essentials are the consensus of directors of coronary care units:

1. Appoint a coronary care committee.
2. Select a physician, preferably a cardiologist, to administer the operation of the unit.
3. Establish a policy for admitting and transferring patients to and from the unit.
4. Set up a cardiac-arrest team for the hospital.
5. Assure a quiet, tranquil environment.
6. Provide adequate, uncluttered space for resuscitative procedures within each patient's cubicle.
7. Require adequate and specialized training for nurses who staff the unit.

Special Training for Nurses

From the initial concept of intensive care for patients with myocardial infarctions, nursing care has been considered a vital component in operating a coronary care unit. In the numerous seminars and workshops during the past 5 years the physician-directors have reiterated the importance of top-quality nursing care as essential to a unit's success.

Several methods have been used to prepare nurses for duty in these specialized units. Probably the most widely used method has been a short period of physician-oriented, inservice education at the hospital employing the nurses. Some hospitals have sent their nurses to work for varying periods with nurses practicing in coronary care units of other institutions. In other hospitals, offering short-term courses seemed to overburden the operating staffs and the hospitals' budgets so it was necessary to discontinue such training.

A meeting of nursing educators and cardiologists was held in Washington, D.C., in July 1966. From this meeting evolved a statement entitled, "Criteria and Guidelines for Nurse Training Courses in a Coronary Care Unit" (*4*). The statement includes recommendations encompassing program development, clinical techniques, selection of trainees, and evaluation of courses for nurse training centers. The appendix to the statement outlines the minimum standards for coronary care units in institutions offering nurse training programs.

In fiscal year 1967 procedures were formalized for offering short-term training courses to staff nurses in coronary care units, and funds were made available to the Heart Disease Control Program for support of such training by contracts with the teaching institutions. Under the program's aegis, the 13 institutions listed offer courses.

Boston University School of Nursing, Boston, Mass.
Catholic University School of Nursing, Washington, D.C.
College of St. Catherine School of Nursing; St. Paul, Minn.
Cornell University School of Nursing, New York City.
Georgia Baptist Hospital School of Nursing, Atlanta.
Hospital of St. Raphael School of Nursing, New Haven, Conn.
Indiana University School of Nursing, Indianapolis.

Rutgers University School of Nursing, New Brunswick, N.J.
Sacred Heart Dominican College School of Nursing, Houston, Tex.
St. Joseph's Hospital School of Nursing, Phoenix, Ariz.
University of California School of Nursing, San Francisco.
University of Colorado School of Nursing, Denver.
University of Washington School of Nursing, Seattle.

All the courses will be demonstration projects during fiscal year 1968. Not all courses are organized in the same way nor will they be conducted for the same length of time.

During the 1968 fiscal year, major emphasis is being placed on a critical review of the criteria and guidelines for nurse training within the coronary care unit. An equally important goal is to engender sufficient interest among schools for professional nurses to encourage them to conduct such courses.

Plans for evaluating the content of the courses and the methods of teaching them include studies by nursing educators cooperating with the Heart Disease Control Program. At stated intervals, attempts will be made to assess the effectiveness of nurses who have taken the courses and returned to duty in coronary care units. These periodic surveys of nursing performance are expected to yield data which will indicate the productivity of the various training courses and the changes necessary to improve them.

A beginning has thus been made toward providing nurses trained to give expert nursing care and to cope with the emergencies in coronary care units. During fiscal year 1968 training will be given to 1,160 nurses who will fill staff positions in hospital-based coronary care units.

Results in Coronary Care Units

The impact of coronary care units on overall morbidity and mortality pertaining to patients with myocardial infarctions has not been fully assessed. However, incomplete data from several institutions have shown the types of patients who benefit from such a unit and the lifesaving potential of a properly staffed and operated unit.

Prevention of cardiac arrest and other potentially lethal complications by early and aggressive treatment of premonitory symptoms of acute myocardial infarction prompted the following statement by Lown and associates (*5*):

> For the first time, it has become possible to reduce materially death resulting from arrhythmias in hospitalized patients with acute myocardial infarctions. The organization of a coronary care unit provided with continuous electrocardiographic monitoring and staffed with a highly trained group of nurses permits immediate detection of arrhythmias and prompt institution of therapy. The abolition of minor rhythm disorders precludes development of major electrical failures of the heart.

The coronary care unit is now accepted as an integral part of the hospital. It has and will continue to assist materially in stimulating and motivating the staff throughout these institutions toward improved care of patients with cardiac disease.

REFERENCES

(*1*) Day, H. W.: An intensive coronary care area. Dis Chest 44: 423–427, October 1963.

(*2*) U.S. Public Health Service: Coronary care units: Specialized intensive care units for acute myocardial infarction patients. PHS Publication No. 1250. U.S. Government Printing Office, Washington, D.C., 1964.

(*3*) U.S. Public Health Service: A facility designed for coronary care. PHS Publication No. 930–D–19. U.S. Government Printing Office, Washington, D.C., 1965.

(*4*) U.S. Public Health Service: Criteria and guidelines for nurse training courses in coronary care units. PHS Publication No. 1629. U.S. Government Printing Office, Washington, D.C., 1967.

(*5*) Lown, B., et al.: The coronary care unit: Perspectives and directions. JAMA 199: 188–198, Jan. 16, 1967.

Program Notes

Heart Disease and Economic Class

Persons insured by the Metropolitan Life Insurance Company under its "standard ordinary" policies have lower death rates for each type of heart disease than the general population. These persons are mainly in the middle and higher socioeconomic strata.

The company's industrial policyholders, representing more nearly the lower and middle socioeconomic status, show generally higher death rates from arteriosclerotic and hypertensive heart disease than those in the U.S. population.

Mortality rates from these causes for the general population lie between the rates for the two classes of insured lives.—*Statistical Bulletin* (Metropolitan Life Insurance Company), June 1967.

Montana Department of Health

The 1967 session of the Montana State Legislature changed the names of certain State agency functions and institutions.

The administrative agency of the State board of health, headed by the executive officer, will become the Montana State Department of Health. This change distinguishes the administrative functions from the policymaking functions of the board appointed by the Governor.

The functions of the board of health and the administrative agency are not changed.

Motel-like Pediatric Clinic

A team of pediatricians in Atlanta, Ga., has designed an office arranged like a motel, with individual examining rooms opening onto a long inside corridor. Dr. William L. Funkhouser, Dr. Olin Shivers, and Dr. Robert C. Garner selected this arrangement in order to prevent cross-infection among children waiting to see them.

The mother and child enter the private examining room through the outside entrance. The mother flips a light switch, which turns on a light above the outside door to alert others that the room is occupied. Simultaneously a light comes on above the inside door to signal to the pediatrician that his patient has arrived. The child leaves the examining room only to be weighed at the central weighing station.—*Georgia's Health* (Georgia Department of Public Health), April 1967.

"Music hath charms . . ."

A change occurred "practically overnight" in young female inmates of the Dixon State (Illinois) School for the Retarded after a background music system was installed.

Upon introduction of the music into one cottage as a start, the girls living in it became much quieter and more responsible, according to Miss Boone Todd, director of a unit at the school. The music also appeared to help employees deal better with the daily tensions.

The inmates of the cottage, young girls who had been transferred from the center nursery, were profoundly and severely retarded. Some were autistic, schizophrenic, or epileptic. Their behavior was erratic.

Fluoridation for Illinois

Like Connecticut and Minnesota, Illinois has now initiated a statewide fluoridation program. Governor Otto Kerner approved a bill on July 18, 1967, requiring fluoridation of all public water supplies.

Mandatory Hospital Screening

Patients entering hospitals in New York State who belong to groups at high risk of cervical cancer or of tuberculosis must now be tested upon admission.

All women 25–54 years of age are required to have a routine uterine cytology smear when they enter a hospital unless they have had one in the preceding 3 years or unless the test is deemed medically inadvisable.

Chest X-rays upon hospital admission are required for all patients over 15 years of age in New York City—25 years of age upstate if they reside in communities designated as having a high prevalence of tuberculosis. Excepted are persons who have been tested in the preceding 6 months.

These two potentially lifesaving tests are required under new provisions of the New York State hospital code.

Poor Food Storage

In 99 counties of Georgia, food in low-income homes is exposed to rats and insects. This fact was learned from responses of 352 public health nurses throughout the State to a questionnaire sent them in early 1967 by the nutrition service of the Georgia Department of Public Health. The questionnaire sought the nurses' opinions on kitchen conditions in the low-income homes that they frequently visited.

Dr. Eleanor Petrie, director of the nutrition service, commented: "It appears that the 'cart has been put before the horse' by providing food without attention to proper storage space or containers for the large amounts of food issued through the commodity food program or purchased through the food stamp program.

"The family reverts to the only resource at hand, the neighborhood store, to satisfy their hunger. They live from hand to mouth, and health agencies spend millions of dollars each year repairing the damages directly resulting from inadequate diet."

Items for this page: Health departments, health agencies, and others are invited to share their program successes with others by contributing items for brief mention on this page. Flag them for "Program Notes" and address as indicated in masthead.

1967 Report on Smoking and Health

A report, "Health Consequences of Smoking," which summarizes 3½ years of research, has been released by the Public Health Service. The report concludes that the 1964 findings of the Surgeon General's Advisory Committee on Smoking and Health have been confirmed and, in many ways, strengthened.

Presented in two parts, part 1 sets forth current information on the health consequences of smoking and part 2 provides technical reports on the relationship of smoking to cardiovascular disease, chronic bronchopulmonary disease, cancer, and other conditions.

Four major conclusions are stated in the 200-page 1967 report:

1. Cigarette smokers have substantially higher rates of death and disability than their nonsmoking counterparts in the population; this means that cigarette smokers tend to die at earlier ages and experience more days of disability.

2. A substantial portion of earlier deaths and excess disability would not have occurred if those affected had never smoked.

3. If it were not for cigarette smoking, practically none of the earlier deaths from lung cancer would have occurred; neither would have a substantial portion of the earlier deaths from chronic bronchopulmonary diseases, commonly diagnosed as chronic bronchitis or pulmonary emphysema, nor a portion of the earlier deaths of cardiovascular origin. Excess disability from chronic pulmonary and cardiovascular diseases would also be less.

4. Cessation or appreciable reduction of cigarette smoking could delay or avert a substantial portion of deaths which occur from lung cancer, a substantial portion of the earlier deaths and excess disability from chronic bronchopulmonary diseases, and a portion of the earlier deaths and excess disability of cardiovascular origin.

The report points out that, since the 1964 report, the emphasis of the present problem has veered from the question of whether cigarette smoking causes disease to the following more precise questions:

1. How much mortality and excess disability are associated with smoking?

2. How much of this early mortality and excess disability would not have occurred if people had not taken up cigarette smoking?

3. How much of this early mortality and excess disability could be averted by cessation or reduction of cigarette smoking?

4. What are the biomechanisms whereby these effects take place and what are the critical factors in these mechanisms?

Among the important research projects which have added to the knowledge since the 1964 report are new information from four continuing population studies on the relationship of smoking and mortality and a national survey on the relationship between smoking and illness. The extent of the association between cigarette smoking and early deaths and excess disability is suggested in the following statements from the new report:

- Of men between the ages of 35 and 60, approximately one-third of all deaths are "excess" deaths in the sense they would not have occurred as early as they did if cigarette smokers had the same death rates as nonsmokers.
- Cigarette smoking is now the most important cause of chronic bronchopulmonary diseases and greatly increases the risk of dying from these diseases.
- Men who smoke cigarettes have a death rate from coronary heart disease 70 percent higher than that of nonsmokers. This rate increases to 200 percent and even higher in the presence of other known "risk factors" such as high blood pressure and high serum cholesterol.
- Seventy-seven million days of work are lost each year in the United States which would not have been lost if cigarette smokers had the same rates of illness as nonsmokers.
- A relationship between cigarette smoking and death rates from peptic ulcer has been confirmed, and data suggest now that a similar relationship exists between cigarette smoking and morbidity from this cause.

synopses

HANSON, MARY L. (Public Health Service), COMSTOCK, G. W., and HALEY, C. E.: ***Community isoniazid prophylaxis program in an underdeveloped area of Alaska. Public Health Reports, Vol. 82, December 1967, pp. 1045–1056.***

Following a successful controlled trial of isoniazid prophylaxis for tuberculosis in western Alaska, isoniazid was offered in a 1963–64 demonstration program to all eligible members of the population. The recommended dose was approximately 5 mg. per kilogram of body weight, to be taken once daily for 1 year. Local personnel were relied upon to distribute medication and to motivate the people in the demonstration villages to participate with minimal supervision from public health nurses.

Approximately 80 percent of the population participated to some extent. Children took the medication best; elderly persons did poorly. Participation was poor in Bethel, the administrative center of the demonstration area. Participation was better in the smaller villages and best in the remote areas. Most villages ranked similarly in the degree of participation in the 1958–60 and the 1963–64 programs.

Methods of distributing medication, frequency of visits by the nurses, and health education methods did not demonstrably affect village rankings as to medication-taking. Only one apparent characteristic of the local resident selected to distribute the medication was positively associated with a village's participation—freedom from domestic responsibilities. Despite some difficulties with use of local personnel, the program demonstrated that a large proportion of the population could be motivated to take daily medication for a long period with minimal professional supervision.

KAWATA, KAZUYOSHI (Johns Hopkins University School of Hygiene and Public Health): ***Providing a safe water supply in the African bush. Public Health Reports, Vol. 82, December 1967, pp. 1057–1062.***

An experience with treating water in the African bush in the Republic of Chad proved that potable water can be prepared in the Lyster bag by prechlorination, coagulation, sedimentation, postchlorination, and adjustment of pH.

The treated water had to be free of pathogenic bacteria, viruses, protozoa, cercariae of schistosomes, and *Cyclops* which serve as the intermediate host of *Dracunculus medinensis*. This result was attained by maintaining a free chlorine residual throughout a 3-hour treatment period. The free chlorine residual maintained in water drawn from the Chari River was 3 mg. per liter and at three other sites the level maintained was 2 mg. per liter. The bacteriological quality of the water was excellent.

A submersible pump and a portable alternator were found to be ideal equipment for the bush. They were relatively easy to handle and effective for drawing water under varying conditions. The system used was adequate, effective, and relatively uncomplicated, and it could be operated with the help of a few untrained villagers.

MICHAEL, JERROLD M. (Public Health Service), SPATAFORE, GEORGE, and WILLIAMS, EDWARD R.: ***An approach to health planning. Public Health Reports, Vol. 82, December 1967, pp. 1063–1070.***

In the planning-programing-budgeting system known as P–P–B, the objectives and resources of an organization and their interrelations are taken into account to formulate a comprehensive program of action for the entire organization. The system entails program packaging, which integrates the determination of problems and resources, the implementation of programs, and the process of evaluation. Thus, in the health field, planning programs center on health problems rather than on categorical activities, and the use of resources is related to expected health benefits. Benefit-cost studies of alternate plans of action makes this focus possible. Long-range planning can thus be correlated with resource requirements, and a mechanism is provided for continuous evaluation of activities. The collection, storage, and use of program data can also be systematized.

In applying the P–P–B system to the health field, a comprehensive health plan is developed. This plan is a formal, written commitment on the part of the appropriate authorities to take future action to elevate or maintain the health status of a population group. It has to be formulated in relation to the total community. The plan includes a goal stated in terms of health status and of health problems and their related causes and contributing factors. Health objectives, projected over a specified period, are quantified in terms of mortality, morbidity, and days of restricted activity. Program objectives, also projected over a specified period, are quantified in terms of ameliorating causes of the problems. The activities, or plans of action, to be carried out by specified agencies or persons within specified periods are also quantified.

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SPENDLOVE, GEORGE A. (Arizona State Department of Health): *Functions of medical advisers in licensing drivers. Public Health Reports, Vol. 82, December 1967, pp. 1071–1076.*

Ways need to be devised to identify the minority of drivers within a given group (for example, among the physically disabled) who represent a danger to themselves and to others. At present there is no scientifically reliable way of determining which persons will be safe drivers.

Decisions on driver licensing are generally made by nonmedical personnel, but liaison needs to be established between licensing officials and the medical community. One method of obtaining the services of physicians as medical consultants is to create a medical advisory board or committee. Such boards or committees can help keep drivers who are physically, mentally, or emotionally incapable of safe driving off the highways. These boards can also prevent unnecessary denial of driving privileges to those handicapped persons who are safe drivers.

Control of the drinking driver is difficult because he often overestimates his ability to drive; moreover, the public refuses to view drunken driving as it does other crimes. The States have been urged to take the necessary steps to control drunken driving by providing implied consent authority in laws under which any person operating a motor vehicle on a public highway will be deemed to have given his consent to a test to determine his fitness to drive.

Constructive use of implied consent laws will curtail to some degree the personal rights of some persons or groups. The curtailment of individual rights can be justified only by the constructive use of the legal and rehabilitative tools available.

COLLINS, RICHARD N. (National Communicable Disease Center, Public Health Service); MARTIN, ALBERT R.; KARTMAN, LEO; BRUTSCHÉ, ROBERT L.; HUDSON, BRUCE W.; DORAN, H. GORDON; HUBBERT, WILLIAM T.; GOLDENBERG, MARTIN I.; TIRADOR, DEAN F.; MILLER, BRYAN E.; and STACY, J. W.: *Plague epidemic in New Mexico, 1965: introduction and description of cases; epidemiologic features and results of field studies; an emergency program to control plague. Public Health Reports, Vol. 82, December 1967, pp. 1077–1099.*

In a 1965 epidemic of bubonic plague among Navajo Indians in New Mexico, a total of six cases occurred in children between June 21 and September 1. This was the largest epidemic of plague in the United States in a single year since 1924. Epidemiologic investigation established a history of close contact with prairie dogs for five of the victims. One child died, and evidence of secondary plague pneumonia was found at autopsy.

The epidemic was the largest recorded in which each case in a human being was associated with a separate infective source in wild rodents. The cases occurred at a time when epizootics of plague were occurring among prairie dogs (*Cynomys gunnisoni zuniensis*) in New Mexico and Arizona.

Specimens from prairie dogs found dead, fleas from prairie dog burrows, and some fleas from field mice were infected with *Pasteurella pestis*. A cottontail rabbit, *Sylvilagus nuttallii*, was found dead from plague within the limits of a prairie dog colony undergoing an epizootic.

Serologic tests showed that domestic dogs in the affected areas had significant *P. pestis* antibody titers. None of the serums tested from wild rodents was positive for antibodies.

Evidence obtained during the study suggests that a combination of cultural and socioeconomic factors peculiar to the Navajos creates favorable and unique circumstances which make them far more likely than non-Indians to contact infective sources. Although the cases of plague in the Navajo children were not characterized by familial clustering, they can be considered a community cluster. Hypothetically, therefore, the Navajo Indian community represents a situation in relation to wild rodent plague that is different from the commonly accepted epidemiologic view in the United States.

During the summer of 1965, Federal, State, and other agencies concerned collaborated in a short-term emergency plague control program. The major activities consisted of medical surveillance, vector control, and public education.

Prairie dog burrows were dusted with 5 percent malathion and prairie dogs were poisoned. Domestic dogs, Indian homes, ceremonial grounds, camping areas, and other areas where people congregated were treated with insecticide. Emphasis was placed on sites where the plague victims lived and where they were known to have contacted infective natural hosts.