Cardiology at a precipice

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THE LOVE AFFAIR between the American public and American medicine, extant since World War II, has come to an inevitable end. This is not surprising, considering that the increase in the cost of health care delivery has been eight times greater than the inflationary rise in the gross national product (GNP) since 1950. National health expenditures accounted for 4.4% of the GNP in 1950 and now account for almost 12% of the total GNP. Part of the increase in health care costs is the result of an oversupply of physicians. In 1950 there were 141 physicians per 100,000 population. Presently there are about 220 per 100,000. There are several indications that the increase in the quantity of physicians and health care resources is occurring faster than any increment in the demand for physician services. Although people are living longer, which will eventually result in a greater number of elderly patients, the maximum effect of this increase in the aged patient population will not take place until the beginning of the 21st century. Moreover, in recent years there has been a decline in the number of hospitals and an even greater reduction in the quantity of hospital beds; as a consequence, the number of hospital beds per physician decreased from 5.2 in 1970 to 3.1 in 1980. In the near future, the further increase in the number of physicians and coincident reduction in hospital beds will lower this ratio to an even greater extent. Furthermore, as specialists continue to locate in nonmetropolitan areas and small cities, referral patterns for specialized care are changing. With certain specialties in medicine being overcrowded, some physicians may have to change or add specialties to maintain economically viable medical practices.

The federal government has adopted an interventional approach to alter the economic performance of the health care sector, and third-party payors have become more aggressive in containing health care costs to reduce the rate of increase in health insurance premiums. At the same time, hospitals have become more active in containing costs, competition among physicians for access to hospital resources has grown considerably, and actual competition between physicians and hospitals in the primary medical care market is evolving. Big business is developing its own health care delivery plans, and the number of health maintenance organizations and preferred-provider organizations are increasing rapidly. Medicine is truly at a crossroads.

Factors affecting cardiology training programs. These problems affecting general medicine have a great impact on cardiologists and cardiology training programs. The available data suggest that there is an overabundance of cardiologists in the United States today, at least in private practice. From 1970 to 1980, there was an increase in the number of specialists in cardiovascular disease of between 51% and 66%. Furthermore, as might be anticipated, cardiology was specifically identified as an overcrowded specialty by many physician respondents to an American Medical Association attitudinal survey on physician manpower in 1982. On the other hand, the data concerning the probable surplus of cardiologists are “soft.” Many physicians who are neither board-eligible nor board-certified in cardiovascular diseases call themselves “cardiologists.” Whether or not there are too many qualified cardiologists in 1985 is a matter of some speculation. There certainly appears to be too few academic cardiologists with adequate training in clinical and/or basic science research.

There are currently between 240 and 270 cardiology training programs in the United States and somewhat over 1700 cardiology trainees. The number of cardiology trainees increased greatly from 1970 to 1975, rose by a small increment between 1976 and 1981, and then underwent a second important growth phase between 1981 and 1985. The number of trainees in cardiology is more than twice the number of trainees in either of the two next most popular medical subspecialty training programs, gastroenterology and pulmonary diseases. It is of interest that the latest increment in the number of trainees correlates with the widespread use of interventional coronary angiography in the practice of cardiology.
Presently, the subspecialty programs in internal medicine are undergoing their first individual evaluations for accreditation over a three year cycle that will end in October 1986. Subsequently, a list of accredited programs in cardiovascular disease as judged by the Residency Review Committee—Internal Medicine (RRC-IM) for the Accreditation Committee on Graduate Medical Education will be published and eventually only physicians trained in accredited programs will be allowed to take the American Board of Internal Medicine (ABIM) subspecialty examination in cardiovascular diseases. Accreditation criteria in cardiovascular diseases include well-rounded training in all aspects of clinical cardiology, including a major training component in cardiovascular research. Although only two years of training in cardiovascular disease are currently required, information is being collected by the RRC-IM relative to a third year of training from those programs in which that option exists or in which three years of training are required.

At the last two meetings of the Association of University Cardiologists and of the American College of Cardiology Program Directors, there was considerable discussion concerning the optimal structure of training programs in cardiovascular diseases, the certifying examination in the subspecialty of cardiology, and the dwindling federal support of clinical cardiovascular research. In addition, these organizations have conducted several written surveys of cardiologists relating to problems facing our subspecialty. The majority of attendees at these meetings and survey respondents indicated that a minimum of three years of training should be required to provide well-rounded experience in clinical cardiology, including competence in noninvasive and invasive cardiac techniques, minimal to more extensive experience in cardiovascular research, and sufficient background in patient-related activities to become a cardiac consultant. Two years of training are inadequate to obtain sufficient clinical skills in cardiology; to receive appropriate training in electrocardiography, echocardiography, cardiac catheterization and angiography, nuclear cardiology, and clinical electrophysiology; and to participate in meaningful cardiovascular research. In many cases, four years of training may be optimal, especially for the academic cardiologist developing expertise in basic research who will need to compete for cardiovascular research funding on a regular basis during his or her professional career. Most cardiology program directors agree that there are too few truly academic cardiologists and that current programs are not developing a sufficient number of cardiologists interested in long-term academic careers with a major component of their activities related to clinical or basic research.

Potential solutions. There are several potential methods for reducing the number of cardiovascular trainees if there is agreement that the number of "cardiologists" is excessive for the health care delivery needs of the United States in 1985. The first method is to reduce, voluntarily, the number of programs and/or the number of cardiology trainees. Although this has been initiated in certain medical centers, it is unlikely to happen in great numbers. Cardiology trainees provide a "double-edged sword" for the program director. On one hand their manpower is required to support the multiple clinical, teaching, and research activities of the typical cardiology division, and additional well-trained academic cardiologists are needed. On the other hand, many, if not most, of the trainees eventually enter the private practice of cardiology and often end up in competition with the cardiology program where they were trained. Perhaps this manpower problem could be resolved if monies used for trainee support could be allocated to fund additional full-time cardiovascular scientists, research nurses, and cardiology technicians.

Second, the number of cardiology training programs may be reduced by the firm application of strict accreditation criteria. However, many pre-reviewers participating in the current subspecialty accreditation process estimate that less than 20% of cardiology training programs will be refused accreditation by the criteria applied. These primarily will be small, private hospital-based programs where one to four trainees care for the hospitalized patients of private-practice cardiologists, who appropriately spend most of their time in their practices.

A third approach is to reduce the percentage of cardiologists passing the certification examination in cardiovascular disease. In the past, the rate of successful candidates has been relatively high, averaging 67% overall, with United States medical schools first-time candidates having a passing rate of greater than 80%. Specific action by the Subspecialty Board in Cardiovascular Diseases and the parent ABIM will be required to exercise this approach.

A fourth method for reducing the number of trainees completing fellowship programs each year is to increase the required duration for training in cardiology fellowship programs to three years. If the latter approach is applied and the number of available stipends is kept constant, the number of cardiology fellows completing training each year can be reduced by one-third. As discussed above, the trend toward three year...
programs is consistent with the criteria for accreditation of subspecialty programs in cardiology, particularly considering the need for each program to have a research component. Recently, the American Board of Clinical Pathology and the Pediatric Subspecialty Board of Hematology-Oncology each increased by one year the duration of training required for board certification. The Pediatric Subspecialty Board of Pulmonology started with a three-year training requirement and the Pediatric Subspecialty Board of Pathology and Clinical Pediatrics has requested another year of required training before certification. The ABIM would have to approve any additional training requirement for certification in adult cardiology as would the American Board of Medical Specialties, but precedence certainly exists.

**Recent changes in cardiology.** During the past decade there have been important basic and clinical research developments that have reduced the morbidity and mortality due to cardiovascular disease in the United States. As a result there are better diagnostic and therapeutic options for patients with cardiovascular disease. Many of these advances have resulted from the application of new high-technology procedures to the practice of cardiology. Many cardiology trainees desire to learn these special techniques and almost every practicing cardiologist wants to have them available for his or her patients. The further development and more frequent use of cardiac transplantation, electrophysiologic testing, implantable cardiac defibrillators, Doppler echocardiography, nuclear cardiology techniques, early postinfarction coronary thrombolysis, and percutaneous transluminal coronary angioplasty have been major achievements in cardiology. However, the expense of providing these options for large segments of the American public is staggering. Furthermore, there is great potential hazard to individual patients when some of the more complex techniques and procedures are performed by physicians with inadequate training and experience in their use, as many patients become part of the operator’s “learning curve.”

Most cardiovascular trainees and practicing cardiologists want to be trained in all income-generating cardiovascular procedures. It is reasonable to assume that a trained cardiologist will probably not be used as a cardiac consultant unless he or she can perform all diagnostic and therapeutic procedures that are available in other parts of the community. Moreover, because of the large number of cardiologists in private practice and the large number of trainees in cardiology, there is considerable competition for cardiovascular patients who require these procedures. Many believe that this results in the more frequent use of expensive cardiovascular procedures. Many cardiologists, including those at academic centers, believe that if they do not perform a procedure with borderline or questionable indications, the referring physician will find another “cardiologist” who will. This approach has a deleterious effect on the cost of health care delivery and has nearly exhausted the capacity of the American patient population to absorb increasing cardiovascular health care expenses.

Presently, cardiovascular trainees too frequently neglect their research activities or their experience in less dramatic aspects of clinical cardiology so they may be present at interventional diagnostic or therapeutic studies performed within their cardiology divisions. Recent test results suggest that the general clinical ability of those taking the cardiology subspecialty examination has declined as the need and desire to provide training in an increasing number of high-technology procedures during the usual two years of experience have grown. For example, the performance of candidates in the electrocardiography portion of the most recent subspecialty examination in cardiovascular diseases was mediocre at best.

**Implications for cardiology.** These considerations lead to the important question of whether or not all “cardiologists” should be trained to perform “interventional cardiology.” Should there be special certification for specific procedures, with additional training requirements and assessment of competency for cardiologists who perform percutaneous transluminal coronary angioplasty or clinical electrophysiologic testing? There are no generally accepted standards for training in these areas. Standards have been proposed for training in echocardiography and in nuclear cardiology, but neither have been rigidly applied. There are no cardiology procedures that have been designated to be reimbursed only when performed by board-eligible or board-certified cardiologists, let alone procedures earning monies only for cardiologists with additional documented training and expertise in highly specialized procedures and in interpretation of their results. This designation would be a new posture for the health care community.

Nevertheless, hospital administrators and chairmen of departments of medicine of the current era are cognizant of the large number of cardiologists in relation to the quantity of hospital beds and to the number of testing facilities. Therefore they are likely to respond to guidelines indicating requirements for performing specialized procedures by permitting only cardiologists who meet the stated criteria to use their hospital facilities for performing such studies. For similar rea-
sons, third-party payors might also reimburse only cardiologists who meet the stated criteria.

There are many problems facing cardiology and cardiology training programs. Considering the state of cardiology manpower, the inadequate federal funding of clinical and research activities, the cost of cardiology health care delivery, and the number of high-technology cardiac procedures available, the time for action is now. Cardiology is at a precipice. Whether or not it falls into the abyss of complete federal control depends on whether the leaders in academic centers, members of cardiology professional societies, and practitioners of cardiology in general are willing to modify their self-interests and interact with other elements in the health care delivery sector to produce the reasonable changes necessary for continuing excellence in the delivery of cardiovascular health care to the American public.

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Vol. 72, No. 2, August 1985
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Circulation. 1985;72:258-261
doi: 10.1161/01.CIR.72.2.258

Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0009-7322. Online ISSN: 1524-4539

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