A life so short, a craft so long to learn
Hippocrates, Aphorisms

As we move into the new millennium, the deficit of able and willing cardiovascular physician providers widens. In 1980, the Graduate Medical Education National Advisory Committee (GMENAC) predicted an "oversupply of 145,000 physicians in the US by the year 2000."1 Subsequently, in the early 1990’s, physician workforce analysts used physician staffing patterns at closed panel Health Maintenance Organizations (HMO’s) to predict the number of physicians required per 100,000 population. Based on the HMO model, the predicted physician surplus would exceed 150,000 by the year 2000.² National major medical organizations responded to these predictions by reducing the number of physician training positions available, particularly in subspecialties such as cardiology, where 12% of fellowship training positions were eliminated between 1995 to 2001.³⁻⁵ However, cardiovascular diseases are more prevalent with age, and the US population is growing older. In a recent census, the most rapidly growing decade on a relative basis was that in excess of 80 years old. As older people need more cardiovascular care, who will provide it? Through enhancements in technology and care processes, the mortality due to cardiovascular disease has progressively declined over the past 20 years. This success has allowed the survival of many individuals with chronic cardiovascular disease who require extended care. Remarkably, as the overall burden from cardiovascular disease increases, the supply of qualified individuals to provide care has diminished and threatens to limit access to health care unless remedies are found.⁶⁻⁹ A number of factors contributing to this “cardiovascular care deficit” are eloquently defined and analyzed by Drs W. Bruce Fye, Robert Bonow, and Sidney Smith,¹⁰,¹¹ in this issue of Circulation. Their consensus opinion is that the US cardiovascular care deficit will continue to widen in coming years, even if remedial measures are implemented in the very near future. We believe this situation is critical and complex.

The Demand

The “growing burden” of cardiovascular disease in the United States is identified by Drs Fye, Bonow, and Smith.¹⁰,¹¹ Driven both by incremental disease prevalence in the aging population as well as improved long-term survival of individuals with chronic cardiovascular diseases, the number of persons requiring cardiovascular care has grown exponentially. In addition, cardiovascular physician providers have more “life-saving” and “life-prolonging” procedures than ever before. Many of these procedures (ie, biventricular pacemaker implants, intracardiac defibrillators, and complex coronary or peripheral vascular interventions) are subspecialized and are ideally provided by individuals with additional credentialing and certification (above and beyond that required for general board certification in cardiovascular diseases).

The rapid evolution in technology has prompted additional certifications in cardiac electrophysiology, coronary intervention, nuclear cardiology, and echocardiography. The proverbial “jack of all trades” who is a “master of none” draws question as to the ability and quality assurance of “general cardiologists” to perform many of these tasks. Education and training requirements for obtaining additional certification and credentialing have increased and may be requisite to...
reimbursement for services provided. Current cardiology fellows in training are largely focused on subspecialization. In a recent American College of Cardiology survey, 75% of fellows desired to have >50% of their practice devoted to a subspecialty, and only 13% wanted to practice “general cardiology.”13 Another factor driving the incremental demand for subspecialized cardiovascular care that was not specifically addressed by Drs Fye, Bonow, and Smith is the remarkable proliferation of new cardiovascular programs in the United States. Such program proliferation has been spurred by current reimbursement schemes that provide larger relative profit margins on cardiovascular procedures and diagnosis-related groups than for other types of procedures and diagnoses. Thus, many small community hospitals are developing programs for percutaneous coronary intervention with or without provisions for cardiothoracic surgery. These programs are strategically targeted toward meager volumes of “low-risk,” “good payor mix” patients for cardiac surgical procedures under the guise of “patient convenience,” when many are within 30 minutes’ transport time from existing, large-volume tertiary centers. Acknowledging the established link between both institutional and operator procedural volumes with periprocedural mortality, how many patients will receive less than optimal therapy and/or have unnecessary complications of their procedures?13–18 The fragmentation and reduplication of tertiary cardiovascular services in the pecuniary interest of small community hospitals contributes to the relative deficit in cardiovascular physician availability. Other demand catalysts for cardiovascular physicians include the relatively recent observation that clinical outcomes are improved for several high-risk cardiovascular disorders (ie, acute myocardial infarction; congestive heart failure), when at least part of the care is provided by a cardiologist (versus internist/primary care provider).19,20 Furthermore, the general public today is better informed and educated and comes with higher expectations for their care. Women in particular are more aware of the threat posed by coronary heart disease. Lastly, cardiovascular risk screening techniques (nuclear or echocardiographic stress testing, high-resolution computed tomography or electron beam coronary calcium scoring, and hs-C-reactive protein) are being more widely applied than ever before.

The Supply

Our current deficit in cardiovascular physician providers may at least in part be traced to the reduction in the number of fellows in training that occurred in the mid-1990s. This “blueprint” for limiting cardiovascular trainees was focused on reducing the number of costly cardiovascular procedures by reducing the number of qualified individuals available to perform them. As detailed by Dr Fye, this misguided strategy (ie, limiting cost of cardiovascular care by limiting the number of providers) did not consider realistic projections for patient demographics or innovations in technology that would subsequently drive incremental volumes of life-saving procedures. Although this aspect of our current dilemma is well outlined by Drs Fye, Bonow and Smith, other important phenomena that further limit access to cardiovascular care have evolved. First, there has been a decline in the number of US-trained medical students who are entering cardiology fellowship programs. Although the percentage of international medical school graduates entering US cardiology fellowships has increased progressively from 15% in 1970 to 39% in 2001, recent changes in US immigration policy may jeopardize this supply of qualified candidates.21 Secondly, some have suggested that cardiovascular physician productivity in aggregate appears to be decreased in part as a result of early retirement and in part as a result of the increased proportion of women practitioners.1,22 Others argue that women, in addition to Hispanics and African-Americans, are under-represented in cardiology training programs when compared with the general population.22,23 Nevertheless, the early attrition of well-trained cardiovascular specialists from active, “successful” practices was unanticipated. Many cardiovascular specialists have prematurely left practice to pursue opportunities in industry or medical administration or simply to retire.

The plans for expedited training of more cardiovascular specialists outlined by Drs Fye, Bonow, and Smith must develop in parallel with efforts directed toward retention of existing practitioners and new graduates. Factors prompting early attrition of cardiovascular practitioners must be examined.24 For example, in the absence of meaningful tort reform, the liability for practicing cardiovascular medicine has risen progressively and in some states has prompted temporary work stoppage and/or physician migration. Indeed, the cost of malpractice insurance has become virtually prohibitive in many geographic regions. In addition, practicing physicians are progressively regulated and monitored. The growth of template-driven electronic medical record systems has at least, in part, been driven by the need to adequately document level of service (ie, justify incremental reimbursement) or the concern for audits. The cost for implementing these systems is borne by the practicing physician. A further increase in regulatory bureaucracy has accompanied the recent Health Insurance Portability and Accountability Act (HIPAA) legislation.25,26 Again, the cost for implementing and maintaining HIPAA compliance is borne by the practitioner. Issues of liability, accountability, and reimbursement are compounded by a perceived loss of autonomy in the medical decision-making process and by lifestyle concerns.24 Lifestyle issues are more consummate for the increasing proportion of practitioners who are women.22,23 Conflicts engendered by demands of a young family can be challenging. The burden of working “full time” and assuming “full call” may be intolerable in the context of unfettered liability, marginal reimbursement, and pressing family interests.

Solving the Supply-Demand Mismatch

We applaud efforts on the part of Drs Fye, Bonow, and Smith to expedite the current arduous and protracted training re-
quirements for cardiovascular specialists. A greater focus on core competencies during the processes of specialization could reduce the time required without sacrificing quality of training. Any effective solution to the widening cardiovascular care deficit must consider all aspects of physician recruitment and retention. In addition to facilitating abbreviated, more focused training, liability tort reform, incremental reimbursement, and regulatory issues must be addressed. If the quest for autonomy and control of one’s destiny that distinguished and drove the last generation of physicians toward a career in medicine is less achievable today, more traditional market forces will govern the interest, desirability, and availability of cardiovascular specialists in the future. Interestingly, current training programs may have limited capacity to expand. Physician shortages, particularly in subspecialties such as cardiology, have had negative effects on faculty recruitment and retention, clinical education, and clinical revenues. The lack of faculty will jeopardize the quality of fellowship training programs.

An alternative option to increasing the number of cardiovascular physicians is to limit the spectrum of physician services provided. Many services currently provided by physicians could be relegated to nonphysician providers. Hence, the growing interest in nurse practitioners, physician assistants, and other allied healthcare personnel to form the “team care” concept. In recognition of the growing importance of nonphysician providers, the American College of Cardiology has recently approved a new membership category for nonphysicians (nurse practitioner, nurse, or physician assistant) with a career focus in cardiology.

Only through a comprehensive, multifaceted approach that expands and expedites education, facilitates consolidation of hospital facilities for the provision of tertiary care, and promotes the retention of practicing specialists, will the current cardiovascular care deficit be remedied. Similar approaches, driven by similar principles, will likely evolve in other noncardiovascular specialties as well. Our consummate challenge will be to align the incentives and objectives of the various diverse components of our current healthcare delivery system. Meaningful physician leadership as exemplified by Drs Fye, Bonow, and Smith, among others, will be crucial to solving these problems.

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The United States Cardiovascular Care Deficit
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doi: 10.1161/01.CIR.0000119802.71603.A0
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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