

## EXECUTIVE SUMMARY

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# Cardiovascular Disease in the Elderly

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### I. Introduction

The elderly represent the most rapidly growing population group in the United States. Approximately 26 million people aged  $\geq 65$  years currently live independently, and this number is estimated to increase by 20% during the next decade. At present there are approximately 2.7 million people in the United States aged  $\geq 85$  years, the "oldest old"; this group is the fastest growing population segment and is projected to increase by nearly sixfold, reaching almost 16 million by the year 2030. These dramatic demographic shifts will engender profound consequences for our society, including the need to markedly increase the funding for the health care of this burgeoning elderly population.

Persons  $\geq 65$  years currently consume over one-third of all U.S. health care expenditures, although they constitute only 12% of the population. Much of this cost is for treatment of cardiovascular disease, the major cause of death and disability in the elderly. The majority of patients with coronary heart disease and its complications are  $>65$  years. The high and rapidly increasing share of health care needed for the elderly has generated a dramatic growth in Medicare expenditures, creating a virtual crisis for federal policymakers. Although the Medicare program is recognized as our society's moral commitment to meet the health needs of the elderly, debate continues as to how to meet the rapidly escalating Medicare costs. It seems inevitable that medical care will be rationed unless the U.S. public and its elected representatives and leaders alter present priorities for allocation of resources. The U.S. public and its elected representatives and leaders must decide how much of our resources we are willing to devote to health care in general and health care for the elderly in particular. Regardless of the total resources allocated for health care, its quality must be maintained and its cost-effectiveness continually examined and reevaluated. The public should appreciate that establishment and maintenance of standards of care constitute the unique capability and responsibility of the medical profession. All other decisions can and should be shared, but quality of care is an issue that must be decided by physicians.

Our goals for this Bethesda Conference were multiple and our target audiences varied. Many recommendations are societal and are directed both to the general public, including the elderly, and to society's elected representatives who formulate and promulgate public policy. Other recommendations are designed to aid physicians and other health professionals who care for elderly patients with cardiac disease. Some recommendations are directed to the scientific and research community, including the American College of Cardiology.

### II. General Issues

#### 1) *Characterization of Elderly Patients*

The elderly are a highly heterogeneous group in all respects except chronologic age; and chronologic age poorly predicts functional capabilities. Individuals  $\geq 65$  years of age, with and without cardiovascular disease, vary widely in their physical, behavioral, cognitive and emotional functioning; severity of illness; and expectations from medical care. A pervasive theme of this Conference is that physiologic age, mental status, cognitive ability and the presence of concomitant disease, rather than age itself, should be the major determinants of the extent of the health care. Individual attributes such as ethnicity, culture, prior health status, gender and personality more significantly influence the psychosocial and disability status of elderly patients with cardiovascular disease than does chronologic age.

In general, older patients with cardiovascular disease do not have excessive hypochondriasis when compared with younger people. They are interested in preserving their health and typically are able and willing to adhere to therapeutic recommendations.

In 1985, persons aged 65 in the United States had an average life expectancy of 15.1 for men and 19.5 years for women. Preventive approaches are warranted, because a reduction in risk factors can be achieved even in individuals of advanced age. Efforts to educate and motivate elderly individuals to adopt favorable diet and exercise patterns are worthwhile.

## 2) *Ethical Issues: Effect of High Technology on Medical Care*

One example of the ethical and moral dilemmas facing society is the effect of technologic advances on medical care. Many current diagnostic and therapeutic procedures employ high technology such as electronic devices; new drugs; lasers; nuclear, chemical and metallurgic technologies; and biotechnology. High technology also includes those therapies that preserve patients in a "vegetative" state, from which recovery is not anticipated, but in which death can be averted for prolonged periods. Patients who formerly would have died, now live to consume additional high technology medical and social resources. Some high technology resources reduce costs or prolong useful life, or both; others simply prolong existence and cause the expenditure of social resources perceived by some to be better used differently. Whatever the result, allocations of resources must be determined. Decisions about the application of high technology are often unsettling and uncomfortable—for example, today it may be necessary to decide whether a patient lives or dies, or, in some instances, seems suspended between the two states.

**Costs.** The widespread application of high technology for diagnosis and therapy may generate enormous expenditures that never previously existed, thereby creating financial problems despite the benefit to society in general and the elderly population in particular. For example, ease of application, durability and freedom from malfunction of pacemakers promoted their widespread utilization and increased overall societal costs. For an individual patient, however, a cardiac pacemaker of longer life is a cost-saving effect of high technology. The total estimated cost of cardiovascular procedures in the United States in 1984 was about \$9 billion. These included Doppler velocity studies, noninvasive imaging techniques, cardiac catheterization, catheter and surgical electrophysiologic studies, coronary thrombolysis, percutaneous transluminal coronary angioplasty (PTCA), catheter and surgical ablation of arrhythmias, balloon valvuloplasty, implantable defibrillators and cardiac transplantation. One-third or more of these procedures were performed in the elderly. These represent trends toward more invasive management. For example, the performance of percutaneous transluminal coronary angioplasty increased dramatically, from 26,000 to 46,000 to 106,000 from 1983 to 1985; in 1984, 26% of these procedures were performed in the elderly.

**Ethical considerations.** The increasing use of high technology in elderly patients poses other ethical considerations, including informed consent for these highly complex procedures. The issue of informed consent is unique in caring for elderly patients because of the possibility of decreased competence to understand the advice given and to make a voluntary choice. When diminished competence is recog-

nized, attempts should be made to eliminate or reduce remediable causative factors. If this is not possible, the physician should be guided by knowledge of the patient's prior values and the family's opinion of what the patient would want if able to make a choice. Ethical concerns also involve decisions regarding limitations of diagnostic and therapeutic measures, including the initiation and discontinuation of critical care interventions, fluids, nutrition and the like. Other ethical concerns involve access of the elderly to specialized medical care; this ethical conflict is accentuated in the case of diagnosis related group (DRG)-based funding of health care.

The medical care system in the United States, based on traditional American values, has primarily focused on the care of the individual. But physicians are being forced to confront a competing ethic. A physician's obligation to each patient remains the provision of the best possible care—care based on scientific knowledge, personal skills and humanistic and reasonably efficient principles. An unsettled matter is how physicians should balance their obligations to their individual patients against their obligations to society. There may be times when society's legitimate interests in conserving limited resources come first; in these situations, the interests of patients will be compromised.

## 3) *Government Action to Control Health Care Costs*

To decrease the rising health care costs for the elderly, the administration has decided to decrease the percentage of government expenditures for Medicare. Congress believed that alterations in Medicare reimbursement would be addressed through legislation. Instead, Federal regulatory changes have been enacted to accomplish budget savings. Further, services previously performed and funded by government have been increasingly shifted to the private sector for payment, causing employers to assume health costs that otherwise would have been borne by government. To try to protect services to Medicare beneficiaries, yet control costs, both physicians and hospitals are being pressured. Medicare regulations determine hospital reimbursement for services; a prominent example are the DRGs, which provide payment to hospitals on the basis of diagnosis rather than actual services and expenditures. Further, legislated restrictions are often not included in bills that have the tag "health." For example, the ability of hospitals to provide services has been further decreased by severe limitations on their access to the continued use of tax-exempt bonds.

## III. Medical Issues

This section highlights the differences in the contemporary diagnosis and treatment of cardiovascular disease in the elderly as compared with a younger population. In general, elderly patients are at increased risk of complications

from diagnostic and therapeutic procedures and often have different expectations of outcomes of their illnesses.

### 1) Medical Therapy

**a) Drug therapy.** Aging alters drug metabolism, drug distribution and the renal excretion of drugs; these changes are often reflected by altered plasma drug concentrations. Age alone does not enhance sensitivity to drugs or reduce the benefits of therapy, but may require changes in drug dosage. Decreases in renal excretion and hepatic metabolism occur commonly with aging, so that drug dosage has to be chosen with great care in elderly patients and usually should be decreased for drugs whose clearance is reduced with aging.

Because of the frequency with which elderly patients receive multiple medications, often from several physicians, they are particularly likely to be subject to drug interactions. Recognized or unrecognized concomitant diseases may also adversely affect the patient's response to cardiovascular drugs.

**b) Nonpharmacologic therapy.** Nutrition and physical activity play important roles in maintaining cardiovascular function in the elderly. Exercise can improve the physical working capacity of sedentary elderly individuals. Weight reduction can reduce blood pressure independently of dietary sodium restriction.

### 2) Surgical Therapy

Cardiac surgery should be undertaken for the same indications as at a younger age, and the preoperative evaluation is comparable; however, special consideration must be directed to the mental and metabolic state of elderly patients, in addition to their general physical condition. Many surgical procedures have an increased risk of morbidity and mortality in elderly patients predominantly because of comorbidity. Therefore, before a surgical procedure is recommended, it should be determined whether an elderly patient can actively participate in the postoperative management and is likely to have long-term benefit.

In general, the overall recovery period is longer and more expensive than for younger patients. Time in an intensive care unit is usually longer, and elderly patients require increased nursing attention.

Comparable increased risk characteristics apply to non-cardiac surgery. The high prevalence of asymptomatic coronary heart disease in the elderly demands careful preoperative clinical evaluation for its recognition and assessment of severity.

### 3) Prevention

The major goal of preventive therapy is to decrease disability and dependency. Most risk factors for cardiovascular disease, including hypertension, abnormal serum lipid levels, impaired glucose tolerance, cigarette smoking, obesity

and physical deconditioning, are both highly prevalent and modifiable in the aged. Cardiovascular profiles of standard risk factors retain usefulness in older persons, defining risk over a wide range. Although the elderly have shared in the recent decline in mortality from coronary heart disease in the United States, this decline has been less than in younger patients.

*Hypertension* is a dominant remediable risk factor in the elderly because of its high prevalence and sustained impact in advanced age. Elevated systolic blood pressure confers a substantial risk for all major cardiovascular diseases in the elderly, irrespective of diastolic blood pressure. Glucose intolerance or diabetes independently increases cardiovascular risk.

*Although total serum cholesterol level* does not predict cardiovascular disease in older persons, fractionation into its low-density lipoprotein (LDL) and high-density lipoprotein (HDL) components restores the predictive value of lipid levels.

### 4) Psychosocial Considerations

Physicians should assume cognitive and behavioral competence in elderly patients until it is proved otherwise by diagnostic screening or more comprehensive assessment. Comprehensive psychosocial evaluation of older patients with cardiovascular disease should include information about the following: personality, including coping skills and resources; mood and affect; cognition; functional status prior to the acute illness; family and social support; and recent life changes and circumstances. Expectations of therapy should be ascertained.

Depending on the severity of cardiovascular symptoms, changes in the life style of elderly patients may be reflected in day to day work habits, social and recreational activities, relations with spouse and family, sexual function and even personality.

### 5) Cardiovascular Changes of Aging

*There is an increase in vascular stiffness*, apparently due to alterations in the vascular media. Despite the statistically significant trend in the U.S. for arterial systolic blood pressure to increase with age, there is a wide variation among individuals. The intrinsic heart rate slows with aging and there is reduced responsiveness to catecholamine stimulation.

*Progressive left ventricular hypertrophy with age* occurs concurrently with the rise in arterial systolic blood pressure. The moderate myocardial hypertrophy of aging appears to be a successful adaptation to maintain normal heart volume and myocardial function in the presence of increased arterial pressure. Alterations in the physical properties of the heart prolong isovolumic relaxation which causes a decrease in early diastolic left ventricular compliance.

*The cardiac output at rest decreases or is unchanged with aging.* The effect of age on the cardiac output with exercise depends on the subjects selected for study and has varied from normal to an attenuated augmentation. The hemodynamic profile of elderly subjects during exercise resembles that of younger subjects who exercise with beta-adrenergic blockade. The explanation for the decline in the peak oxygen uptake with age must take into account the 10 to 12% decline in skeletal muscle mass with age. Thus a decline in central circulatory performance cannot be inferred unless the effects of decrease in muscle mass or in the ability to shunt blood to exercising muscles can be excluded. Central circulatory function may not limit the peak oxygen uptake with exercise in the elderly, even though the heart rate, stroke volume or cardiac output at the time of exhaustion are lower in older subjects.

## 6) Clinical Assessment

*The history and physical examination* remain the cornerstones in assessing cardiovascular disease in elderly patients. Accurate evaluation of symptoms may be hindered by the coexistence of multiple diseases, engendering difficulty in attributing signs and symptoms to the cardiovascular system. The mental consequences of illness, drugs and aging may also complicate accurate assessment of the patient's cardiac problem.

*The physical examination may be modified by age and disease.* For example, vascular stiffness may mask the characteristic abnormal carotid pulse contour of aortic stenosis. Blood pressure should be obtained in the supine, sitting and standing positions to elicit postural hypotension. Neurologic examination should include an assessment of cognitive function, with attention to mental depression.

*Noninvasive cardiac diagnostic tests are important in the elderly,* because the history may be unreliable and the physical examination difficult to interpret. The electrocardiogram (ECG) remains useful in predicting cardiovascular disease in the elderly. Despite the decline in maximal aerobic capacity with age, exercise testing is safe and effective in the evaluation of ischemic heart disease and of cardiac function in elderly patients. The extent of rise in systolic blood pressure during an exercise test appears to be the best single predictor of lessened subsequent morbidity and mortality.

*The echocardiogram appears to be of greater value than the chest roentgenogram in assessing overall cardiac size.* Radionuclide ventriculography can provide a quantitative assessment of ventricular function and, although more expensive, it is applicable to more elderly patients than is echocardiography.

## 7) Coronary Disease

By age 80, 20% of elderly individuals have a clinical diagnosis of coronary disease; at that age the prevalence is

equal in men and women. The clinical presentation of coronary disease differs in elderly patients. Chest pain is less frequently the presenting or prominent symptom of acute myocardial infarction. Surgical procedures associated with acute blood loss or hypotension, as well as transient ischemic attacks, stroke or other illness, often precipitate myocardial infarction in the elderly.

*ECG confirmation of acute infarction* may be more difficult in the elderly because of an increased frequency of conduction disturbances, prior infarction and left ventricular hypertrophy. Measurements of left ventricular function at rest and with exercise, using radionuclide ventriculography or two-dimensional echocardiography, do not reliably indicate coronary heart disease and myocardial ischemia in the elderly.

*The general management of elderly patients with acute myocardial infarction* differs a little from that of younger patients with few exceptions. Primary ventricular fibrillation is less common in elderly patients with acute infarction and adverse central nervous system effects from lidocaine are increased; thus routine use of prophylactic lidocaine has less rationale in this age group. Congestive heart failure is more common in elderly patients.

*Not only is the in-hospital mortality higher for elderly patients with acute myocardial infarction,* but the 1 year mortality of elderly survivors of acute myocardial infarction is almost four times greater at  $\geq 70$  years than at 50 to 59 years. Elderly patients with infarction have an increased incidence of multivessel disease and left main coronary artery stenosis. Consideration of coronary bypass surgery must take into account the increased incidence of complications of coronary angiography and the higher operative risk in patients  $> 70$  years; however, long-term survival after coronary bypass surgery is excellent in specific subgroups of elderly patients.

*Medical therapy* with vasodilator drugs such as nitrate and calcium blocking compounds (nifedipine) is more likely to produce postural hypotension or impaired atrioventricular (AV) conduction (verapamil and diltiazem). Elderly patients derive equal benefit from the long-term administration of beta-blocking drugs after myocardial infarction; the reduction in mortality and reinfarction is similar in patients aged 65 to 75 years and in younger patients.

## 8) Hypertension

Hypertension is common with advancing age, approaching or exceeding 50% prevalence in the aging population. The higher the systolic and diastolic pressures, the greater the morbidity and mortality from coronary heart disease, congestive heart failure, stroke, renal failure and intermittent claudication. Therefore when the systolic blood pressure is consistently  $> 160$  mm Hg, or the diastolic pressure is  $\geq 90$  mm Hg, treatment by nonpharmacologic or pharmacologic means, or both, is indicated.

*Nonpharmacologic means to reduce blood pressure* are suggested for individuals with diastolic pressures between 90 and 94 mm Hg. The three major nonpharmacologic approaches are a sodium-restricted diet, weight control and moderation in alcohol consumption.

*Pharmacologic therapy is safe and well tolerated in the elderly.* The Joint National Committee favored a diuretic as initial treatment for elderly individuals. In other studies, treatment of elderly patients with beta-blockers and diuretics was equally effective. Others have suggested initiating therapy in the elderly with an angiotensin-converting enzyme inhibitor or a calcium blocking drug. Adverse effects of antihypertensive drugs in the elderly may be minimized by starting with lower doses and by checking blood pressure in the upright position.

*Patients whose systolic blood pressure is between 140 and 160 mm Hg, with a diastolic pressure <90 mm Hg,* have borderline isolated systolic hypertension. These patients should have their blood pressure measured at 6 month intervals. The risk of isolated systolic hypertension is sufficient to justify cautious drug therapy if nonpharmacologic therapy fails to lower the systolic blood pressure <160 mm Hg, even though controlled studies to assess efficacy have not been completed.

### 9) Valvular and Congenital Heart Disease

*Severe calcific aortic stenosis is the most common valvular lesion that requires valve replacement in the elderly.* Because these patients usually have excellent results from surgery (even when the preoperative ejection fraction is reduced), although at a slightly higher surgical risk, it is important to recognize the disorder and to assess its severity.

A systolic ejection murmur, a fourth heart sound and left ventricular hypertrophy commonly occur in the elderly from causes other than aortic stenosis. Noninvasive and invasive tests are often necessary to assess the presence and determine the severity of aortic stenosis in an elderly patient. Doppler velocity recordings are useful in this regard.

*Common causes of mitral regurgitation in the elderly* include coronary artery disease and its complications, myxomatous degeneration of the mitral valve cusps resulting in mitral valve prolapse and mitral annular calcification. The diagnosis of mitral regurgitation can usually be made by cardiac auscultation; two-dimensional echocardiography and echo-Doppler studies are useful in assessing etiology and severity.

*Most elderly patients require cardiac catheterization and angiography before valvular surgery.* Selective coronary arteriography can identify the need for concomitant coronary bypass surgery or the presence of inoperable coronary disease and its attendant increase in surgical risk.

*In the elderly patient with valvular or congenital heart disease,* the clinical picture of infective endocarditis is more

likely to be obscure or atypical. The high mortality of infective endocarditis in the elderly may be related to late diagnosis and, thus, late treatment.

### 10) Pulmonary Heart Disease

*Ventilatory function and pulmonary diffusing capacity* decline progressively and nonuniformity of lung function increases progressively after age 35. The decrease in pulmonary vascular compliance with aging may accentuate pulmonary hypertension in older patients.

*Pulmonary embolism is common in geriatric patients* in whom risk factors for this condition abound (sedentary lifestyle, prolonged bed rest, cardiopulmonary disease). The diagnosis of pulmonary embolism in the elderly is complicated by the decreased specificity of isotopic lung scanning; areas of decreased lung perfusion may be present even in the absence of embolic disease, rendering this test of lesser diagnostic value.

*Older patients with chronic obstructive pulmonary disease* have a higher mortality, in part related to a high rate of complicating overt or clinically unrecognized cardiovascular problems. Therapeutic problems may arise when treating patients who have both cardiac and pulmonary disease, a common combination in elderly patients. Nonselective beta-blockers given for hypertension or coronary disease may induce bronchospasm; beta-blocking agents and theophylline used in patients with chronic obstructive pulmonary disease may have adverse effects on cardiac function and even induce arrhythmias, particularly if the dosage is not carefully controlled.

*Elderly patients with hypoxemia* respond as well as younger individuals do to low flow oxygen therapy; the recommendations of the Nocturnal Oxygen Therapy Trial Group are applicable to the elderly.

*Regular graded exercise* minimizes disability in patients with chronic obstructive pulmonary disease and can improve their quality of life.

### 11) Arrhythmias

Symptoms caused by arrhythmias and conduction disturbances are the same at all ages. Ambulatory ECG recording is the most useful diagnostic technique to correlate symptoms with spontaneous arrhythmias.

*Both tachyarrhythmias and bradyarrhythmias may result in syncope.* This symptom may occur in up to 30 to 50% of presumably healthy elderly adults and remains unexplained in about one-third of these individuals. The increased incidence of syncope in the elderly is due, in part, to the increased prevalence of symptomatic sick sinus syndrome, fascicular blocks and ventricular tachyarrhythmias, as well as to the use of predisposing drugs, for example, beta-blockers, vasodilators, calcium blockers and antihypertensive drugs.

*The sick sinus syndrome and trifascicular block are predominantly geriatric problems.* The prevalence of bradycardia is increased because of both impaired sinoatrial node function and altered autonomic tone. The anatomic substrates include fibrosis of the sinoatrial node with decrease in the number of pacemaker cells; degeneration and fibrosis of the central fibrous body and summit of the ventricular septum, and fibrosis and calcification of the mitral and aortic valve rings and leaflets.

*Asymptomatic elderly patients with the sick sinus syndrome do not require treatment;* this may also be true for patients with brief sporadic palpitations or dizziness. Before pacemaker insertion for symptomatic sinus node dysfunction, it should be ascertained that medications have not contributed to the sinus node dysfunction. Pacemaker therapy is effective in treating the syncope of the sick sinus syndrome; there is an increasing trend to insert dual-chamber pacing mode (DDD) pacemakers. This type of pacemaker is indicated primarily for patients who are ambulatory and physically active, reserving ventricular-inhibited pacing mode (VVI) pacemakers for patients with a shorter anticipated life span who are sedentary or immobilized. Pacemakers can prolong life and improve the quality of life in appropriately selected geriatric patients.

*Asymptomatic ventricular ectopic activity* in an elderly patient does not generally require therapy.

*Antiarrhythmic drug therapy* is potentially hazardous, especially in the elderly. Elderly patients are likely to be taking many medications that may interact with antiarrhythmic drugs, and antiarrhythmic drugs generally have an increased elimination half-life in the elderly because of their decreased rate of elimination or hepatic metabolism, or both. Further, elderly patients are more likely to have disease of the cardiac conduction system or left ventricular systolic dysfunction that may be exacerbated by antiarrhythmic drug therapy.

## 12) Heart Failure

*The prevalence of heart failure* increases exponentially with age. It is more common in men and has a poor prognosis; fewer than half the patients survive 5 years after diagnosis. Specific factors precipitating heart failure are more common and important in elderly patients, mandating attention to their detection and correction.

*It is often difficult to clinically differentiate cardiac from pulmonary causes of excessive breathlessness.* Pulmonary rales are not a reliable sign of left heart failure because of the frequency of chronic pulmonary disease in the elderly. Many patients thought to have exertional dyspnea secondary to heart disease may have dominant pulmonary disease. Further, the manifestations of heart failure may be masked or mimicked by the sedentary life-style of many older patients.

*Decreased ventricular compliance and elevation of the pulmonary capillary pressure* may produce pulmonary congestion and clinical manifestations of heart failure in the elderly patient with preserved systolic function. Decreased ventricular compliance is a likely cause of heart failure in the elderly patient with minimal or no cardiac enlargement, particularly when hypertension, hypertrophic cardiomyopathy or other causes for left ventricular hypertrophy are present. Noninvasive techniques for evaluating cardiac function have improved considerably the recognition of heart failure in the elderly, as well as helping determine if systolic or diastolic dysfunction predominates. Measured left ventricular systolic function correlates poorly with symptomatic heart failure and exercise capacity.

*Treatment of heart failure is similar to that in younger individuals;* improvement in exercise capacity can be expected after treatment. Exercise training can further augment exercise tolerance because of peripheral circulatory and skeletal muscle adaptations; and may improve quality of life in patients with chronic congestive heart failure of all ages.

## 13) Cardiomyopathy

*Congestive dilated cardiomyopathy* is less common in the elderly. In large series of patients >65 years with congestive heart failure, approximately 10% are classified as having dilated cardiomyopathy. Hypertrophic cardiomyopathy is also less common in the elderly. When present, free wall hypertrophy is often equal to that of the septum. Most natural history studies emphasize the rarity of sudden death in elderly patients with hypertrophic cardiomyopathy.

*It is unclear if senile amyloidosis is of any functional clinical significance,* although atrial fibrillation may coexist when there are large atrial amyloid deposits.

*Increasing numbers of elderly patients currently develop postoperative restrictive cardiomyopathy,* presumably secondary to coronary artery bypass surgery or other surgical causes of pericarditis.

## Recommendations

### 1. Public/Legislative Policy

What expectations should society, and the elderly as a component of our society, have for health care? A national policy should be developed in a rational and coordinated manner with three goals in mind: quality, access and cost-effectiveness. A balance must be achieved between the access to affordable quality care when it is likely to be beneficial, concern for the patient's quality of life and the need for fiscal responsibility in view of the finite limitations to the financial resources available for health care. There is a need to educate the public and thereby encourage public involvement in the complex issues involved in weighing health care needs of individual patients when they may

conflict with those related to limited funds for health care. A first step in public education is to confront ethical issues as such and not disguise them behind debates about cost-effective and cost-beneficial health care delivery systems. The question should be raised as to whether the fixed fees to hospitals and the Medicare predetermined hospital stays are compatible with quality care.

*High technology is so integrated into medical practice as to be indistinguishable from other aspects of medical care, but is costly, raising questions as to how much care can and should be supported by society. If the application of high technology will be limited by age, then a permanent second class elderly patient population will be established and this is an ethically unacceptable change.*

*Society must be aware of and address:*

- 1) What justifies present priorities that decrease health care resources and lead to debates about cost-benefit and cost-effectiveness?
- 2) What obligations do we have to provide for health care needs of the elderly? Are we prepared to limit or abandon provisions included in the early Medicare years?
- 3) What obligations do the elderly have to meet their health care costs? Are these the same for the impoverished as for the more affluent elderly?
- 4) Is the public policy shifting the costs of care and the "informal" care needs of the elderly to their families? Is this reasonable or excessive in view of competing demands on filial responsibility?
- 5) Have policy changes adversely affected the access of the elderly with cardiovascular disease to care and adversely affected the quality of this care?
- 6) As a society committed to justice and fairness, can we ask physicians to deny access to care or offer less than quality care solely on the basis of age or cost?
- 7) Which elderly will be denied access to care or receive a decreased quality of care if the above obtains? Will it be based on diagnosis or other criteria? Is there justification for such selective changes?
- 8) What will be the ethical impact of such changes on the physician-patient relation? Should physicians accept such changes? Should society accept such changes?

## II. Tasks for the American College of Cardiology

*The American College of Cardiology should encourage involvement of the public in helping their elected representatives develop health care policies for the elderly. A focus for this debate is how the traditional ethic of medicine appears to be directly challenged by economic constraints on health care for the elderly, constraints imposed both by the public and increasingly by the private sector.*

*Adequate definitions and descriptors of quality cardiovascular care must be developed, with mechanisms for periodic reevaluation of these criteria. The American College*

*of Cardiology should form Task Forces to address these issues for elderly patients, possibly organized on a DRG classification basis, but also addressing variations in severity of illness and case complexity (comorbidity).*

## III. Physician Attitudes and Practices

*The goals of treatment in the elderly are identical to those in younger patients and include improvement in cardiovascular performance, reduction of morbidity, increase in functional capacity to enable an independent life-style and a prolongation of life. The dominant health objectives for the elderly should be the prevention of enfeeblement, disability and dependency, rather than an extension of life, regardless of quality.*

*The view of the elderly as senile, disabled, unproductive and resistant to change is unfounded. Further, inappropriately low expectations for recovery and restoration of functional status by the patient, the patient's family or the physician may limit optimism and adaptive behaviors in the elderly. Physicians should encourage active participation by older patients with cardiovascular disease in their overall health care and should help patients set realistic goals. Physicians should recognize that incentives for recovery and activity resumption after a cardiovascular illness differ in the elderly; return to work often is not a goal. The physician should also provide both education and emotional support for older patients and their families.*

**Prevention.** Preventive measures are ideally initiated early in life to reduce the ultimate burden of cardiovascular disease, but such measures instituted in the aged should not be considered valueless. Preventive measures may ultimately restrain costs. These include moderate sodium restriction with maintenance of dietary calcium. Physicians should also encourage reasonable patterns of activity, including moderate regular dynamic exercise, particularly walking, for its beneficial physiologic, metabolic and psychologic responses. Limiting immobilization and encouraging activity help prevent leg deep vein thrombosis and pulmonary embolism. Physicians should also encourage social activities for older patients with cardiovascular disease. Because of the high incidence and prevalence of hypertension in the elderly population, blood pressures of all elderly individuals should be rechecked on an annual basis, even if initially within the normal range.

*Most trials of drug efficacy for the secondary prevention of cardiovascular disease have excluded patients >70 years. Therefore it is uncertain that results in younger patients can be extrapolated to the elderly. Future trials should include elderly patients.*

*Little is known about the cost-effectiveness of patterns of health care delivery in the elderly. We must ascertain the effect of shortened hospital lengths of stay on the morbidity and mortality of patients with acute myocardial infarction*

and congestive heart failure. These assessments are hampered by lack of definitions of "quality" cardiovascular care. The cost-effectiveness of extended care in a skilled nursing facility or at home rather than in the hospital has to be evaluated.

**Drug therapy.** A combination of the physiologic changes of aging and disease in other organ systems, as well as polypharmacy, increases the likelihood of drug toxicity and adverse drug effects in elderly patients. Increasing attention, therefore, must be directed to decreasing the risk of unwanted drug effects in the elderly.

#### *IV. Research*

**General.** Much basic science and clinical research is needed to provide quality cardiovascular care for elderly persons. Although elderly patients use 30% of all prescription drugs, there is a relative lack of information about the efficacy and disposition of cardiovascular drugs in this population. Elderly patients should be included in studies of experimental drugs currently being tested for the management of cardiovascular diseases.

A further major impediment in the drug treatment of elderly patients is inadequate information about responses in the elderly to a large number of already marketed drugs currently used to treat elderly patients, including potential adverse cardiovascular effects of noncardiac drugs.

Nutritional requirements must be defined for elderly persons. We must also determine benefits and hazards of al-

terations of diet and of exercise in the elderly, and evaluate alternate types of exercise for patients with limited ambulation.

**Coronary artery disease.** Scientific information regarding the recognition of and current treatment approaches to the elderly coronary patient are inadequate or lacking. For example, few prospective studies have assessed risk stratification during or after acute myocardial infarction in patients >70 years, as compared with younger patients. Most secondary prevention studies, both of risk reduction and of drug therapy after myocardial infarction, have included few or no elderly patients; thus the results may not apply to elderly patients. Alternatives to bicycle or treadmill exercise testing are needed to evaluate patients unable to perform these tests.

**Pulmonary disease.** Relatively little is known about the effects of age and aging on pulmonary arterial pressures in healthy individuals. It is also unknown whether the pulmonary circulation responds differently to left ventricular failure or mitral valve disease, or both, in older patients than it does in younger patients. Other than anecdotal information, little is known about the effect of age on a variety of pulmonary conditions or even how commonly some of these illnesses occur in an elderly population.

**Anticoagulation.** The risk-benefit ratio of anticoagulation in the elderly has not been established. Recommendations for routine use of chronic anticoagulation in the elderly patient with nonvalvular atrial fibrillation must await the results of ongoing clinical trials.