Implications of Cholesterol Screening in the Elderly for Total Health Care Expenditures

The literature reviewed in the preceding chapters suggests that the health benefits, particularly as measured by total mortality, of cholesterol screening in the elderly are unproven and may be smaller than in middle-aged people:

- Cholesterol assays in routine clinical use are not as reliable as those employed in epidemiologic studies and may not predict risk as accurately.
- The evidence that cholesterol level is a risk factor for coronary heart disease (CHD) in the elderly is not as consistent and conclusive as the evidence for middle-aged men. Furthermore, it appears not to be a risk factor for overall mortality in the upper ages.
- There are no randomized trials of the impact of cholesterol reduction on CHD or overall morbidity or mortality in the elderly, and no randomized trial has proven that cholesterol reduction lowers overall mortality in the populations that have been studied, with the exception of a study of male survivors of myocardial infarct ion.
- Apart from diet, treatment in the elderly may have more adverse side effects than treatment in younger populations. The elderly take more drugs on a regular basis than do other patients. Multiple drug therapies increase the risk of interactions among the different chemical compounds. In addition, as individuals age, they may be less able to tolerate the unpleasant side effects of cholesterol-lowering drugs themselves.

Cholesterol reduction has been found to reduce CHD morbidity and mortality in middle-aged men, but it did not improve overall survival during the study periods of the randomized trials (usually less than 10 years). Consequently, data about existing treatments do not provide convincing evidence that cholesterol reduction would increase life expectancy among the elderly. Cholesterol reduction might improve quality of life by reducing the symptoms of CHD, but it would also require changes in diet or suffering the side effects of medication.

Because no study has documented the survival or morbidity benefits of cholesterol reduction in the asymptomatic elderly, a precise estimate of the costs and effectiveness of cholesterol screening is impossible. However, the National Institutes of Health has sponsored the development of recommended cholesterol screening and treatment protocols for the elderly (as well as for other age groups) and has widely disseminated these recoin - mendations to physicians and the public (1 16). Therefore, OTA estimated the annual national health care expenditures associated with full implementation of the National Cholesterol Education Program (NCEP) screening and treatment protocols in the elderly population,

The model, described in detail in appendix C, estimates both screening expenditures and expenditures associated with treating all diagnosed hypercholesterolemia in 1995. The number of people who would be treated for hypercholesterolemia, either with dietary guidelines or ultimately, with medication, was estimated with data on the distribution of serum cholesterol and low-density lipoprotein (LDL) levels in the elderly (1 18,1 19). When data on important elements of the model were unavailable, a range of costs was generated to reflect the probable boundaries for specific estimates. For example, the NCEP guidelines call for dietary treatment in certain cholesterol and LDL ranges only when two or more other risk factors (such as being male,

Table 6--- Estimated Total Health Care Costs of Full Compliance With National Cholesterol Education Program Protocol[a] in the Elderly Population in 1995 (in millions of 1988 dollars)

	Percent of population treated	Screening and diagnostic costs	Total costs
Risk factor prevalence 30%:			
Low cost regimen[b]	47%	$57.7	$ 2,905
High cost regimen[c]	47	57.7	9,207
Risk factor prevalence 50%:			
Low cost regimen	52%	$57.6	$ 3,610
High cost regimen	52	57.6	11,472
Risk factor prevalence 70%:			
Low cost regimen	57%	$57.4	$ 4,314
High cost regimen	57	57.4	14,252

[a] Adult Treatment Panel, National Cholesterol Education Program, National Heart, Lung, and Blood Institute, National Institutes of Health, U.S. Department of Health and Human Services, 'Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults," Arch. Intern. Med. 148:36-69, 1988.

[b] Assumes that patients receiving medication pay $525 per year for niacin and related monitoring.

[c] Assumes that patients receiving medication pay $1,687 per year for lovastatin and related monitoring.

SOURCE: Office of Technology Assessment, 1989.

hypertensive, a smoker, or having diabetes) are present. Because data on the frequency with which such risk factors occur in the elderly population are unavailable, the number of elderly treated under the NCEP protocols was estimated for frequencies ranging from 30 to 70 percent of the population.

In other cases, where uncertainty exists about specific factors, the model is constructed to underestimate costs. For example, the health care costs associated with monitoring people who are successful in controlling cholesterol with diet are assumed to be zero. Moreover, dietary intervention was assumed to lower LDL levels by 10 percent, an effectiveness rate that is reasonably optimistic relative to the existing empirical evidence (32). Medication costs were based on prices paid by a State pharmaceutical assistance agency on behalf of its beneficiaries. These prices may be lower than the average retail prices that would be paid by Medicare beneficiaries.

The results of the analysis are presented in table 6. The costs of performing the laboratory tests associated with screening and followup are a very small part of the total costs of screening and treatment. Treatment costs, particularly the costs of medications, constitute the vast majority of annual total costs of the NCEP. Even if relatively inexpensive medications are chosen, the cost of treating hypercholesterolemia is much greater than the cost of detecting it. In 1995, the costs of screening and followup testing would be about $57 million, while total national health care expenditures associated with screening and treatment would range from at least $2.9 billion to $14.2 billion.

The cost estimates in table 6 show what would be spent nationally if all elderly people were to comply with screening recommendations and adhere to the cholesterol lowering therapy called for by the NCEP. Full compliance with the NCEP treatment guidelines

would result in 47 to 57 percent of all elderly Americans on some form of treatment, either diet or medication. Many elderly people are currently receiving cholesterol-lowering therapy, so some of these costs are already being incurred. But many others probably would not comply with the recommended screening or treatment protocols, even if Medicare were to pay for cholesterol screening. For example, in a large well-established and prevention-oriented health maintenance organization in the Northeastern United States, only 75 percent of elderly enrollees had had a serum cholesterol test within the previous 5 years (40). If compliance with the NCEP screening and therapy guidelines were as low as 25 percent, then only 12 to 14 percent of the elderly would actually enter cholesterol-lowering treatment, and the annual health care costs of screening and treatment in the elderly would range from $782 million to $3.6 billion in 1995.

Although these cost estimates are based on optimistic assumptions about the effectiveness of diet in controlling cholesterol and LDL, total estimated costs are extremely sensitive to this assumption. If, for example, a dietary intervention were shown to be able to produce a permanent reduction in LDL levels by 15 percent in the elderly, then national health care costs associated with full compliance in the elderly would fall somewhere between $1.9 billion to $10 billion in 1995. At present, however, there is no reason to expect such a level of effectiveness to be obtained through dietary intervention in the elderly.

Costs to Medicare

Medicare currently does not pay for serum cholesterol or other lipoprotein measurement on a screening basis. However, these procedures are all covered as diagnostic services or as part of the management of previously diagnosed CHD or hypercholesterolemia. Medicare currently pays 80 percent of allowed charges after the beneficiary has met an annual deductible. Assuming that Medicare similarly were to pay 80 percent of screening expenditures, Medicare costs for screening only (including initial testing and-followup, but not treatment) would be between $50 million and $62.6 million in 1995 under a regimen of full compliance with the NCEP guidelines. In addition, Medicare would pay 80 percent of allowed charges for physician services and diagnostic procedures necessary for monitoring drug therapy, which would range from about $250 to $550 annually for each treated individual. If the entire elderly population were to comply fully with the NCEP guidelines, these Medicare expenditures would range from $1 billion to $5.4 billion in 1995, depending on the frequency of risk factors and the mix of medications prescribed for the population. With a 25 percent compliance rate in the elderly, Medicare's expenditures would be reduced proportionately to between $261 million and $1.3 billion.

Expenditures associated with actual drug purchases would be covered by the prescription drug benefit of the Medicare Catastrophic Coverage Act of 1988 (Public Law 100-360). Cholesterol-lowering medications will first be eligible for reimbursement in 1991, with each beneficiary facing a $600 annual deductible on all prescription drug purchases and a 50 percent copayment. Starting in 1993, the deductible will be indexed so that 16.8 percent of all Medicare beneficiaries will have drug expenses that exceed the deductible. The coinsurance rate will be 20 percent. Precise estimates of the Medicare burden for the costs of treating hypercholesterolemia diagnosed through a screening program are not possible. Although only three of the cholesterol-lowering drugs currently available are so expensive that they are highly likely to exceed the annual deductible (lovastatin, colestipol, and cholestyramine; see table 4), Medicare beneficiaries using the other cholesterol-lowering drugs may still become eligible for reimbursement if their total annual prescription drug expenses exceed the deductible. For those elderly who use multiple prescription drugs, a cholesterol screening

benefit would substantially increase Medicare's financial burden for the treatment of hypercholesterolemia. Only one choles-terol-lowering drug--niacin--whose annual retail costs are estimated to be between $100 and $300, would not be eligible for reimbursement under the Catastrophic Coverage Act because it does not require a physician's prescription.

Use of Cholesterol Screening Services

Current Utilization

Little information exists on the current use of cholesterol screening by the elderly. None of the national household surveys conducted to date by the National Center for Health Statistics have collected data on the frequency of cholesterol measurements. The Health Care Financing Administration's (HCFA) Medicare Procedures Database (BMAD) allows estimation of the number of procedures and allowed charges reimbursed under the Medicare program. The database records the use of all medical and surgical procedures as defined in the Current Procedural Terminology (CPT) manual performed in hospitals, ambulatory clinics, and physicians offices.

HCFA provided OTA with data from its BMAD files for all lipoprotein measurement procedures paid by Medicare during calendar year 1986 (see table 7). However, these numbers provide little information about the proportion of elderly with no history of hyperlipidemia or CHD who receive periodic cholesterol screening. First, since Medicare currently reimburses cholesterol measurement only when a patient has symptoms or has been given a diagnosis, the BMAD numbers theoretically should not include any tests done purely for screening purposes. In addition, since the BMAD database records use by procedures rather than by persons, the numbers in table 7 represent more than one test for some Medicare beneficiaries.

Table 7.--Total Number of Lipoprotein Measurement Services Allowed Under Medicare in 1986 by Type of Procedure

CPT[a] code	Name of procedure	Number of allowed services[b]
82465	Total serum cholesterol	678,666
82470	Total serum cholesterol and esters	7,605
83700	Total blood lipids	57,484
83705	Fractionated cholesterol (cholesterol, triglycerides, and phospholipids)	
83719	High-density lipoproteins by ultracentral fugation	32,833
83720	Lipoprotein fractionation by calculation formula	91,578

[a] Physician's Current Procedural Terminology, v. 1. A. Coy, C.M. Fanta, A.J. Finkel et al. (eds.) (Chicago, IL: American Medical Association, 1988).

[b] Data supplied by M. Newton, Health Care Financing Administration, Baltimore, MD, personal communication, October 1988.

SOURCE: Office of Technology Assessment, 1989.

Implementing a Cholesterol Screening Benefit

A decision to include cholesterol screening under Medicare would present at least two issues concerning payment for such services:

1. Paying for cholesterol screening as part of a physician's office visit .-- OTA's analysis of expenditures associated with the diagnosis of hypercholesterolemia in the elderly only includes the charges for specific screening procedures; it does not include the cost of visiting the physician's office. Because many (if not most) cholesterol screenings would take place in the physician's office, this model implicitly assumes that all elderly have their cholesterol checked while visiting their doctor for some other reason. For reimbursement purposes, this assumption is not unreasonable, because each procedure performed as part of a screening program already can be billed separately from the office visit charge

and has an assigned CPT code used by Medicare in paying for services (28). However, if beneficiaries make a special visit to the physician just to have their cholesterol checked, the cost of the office visit becomes part of the true cost of the screening benefit. It is also possible that the introduction of a cholesterol screening benefit would lead to an increase in the number of physician office visits and other medical services used by Medicare beneficiaries by simply encouraging individuals to pay greater attention to their own health.

2. Paying for cholesterol screening in community settings.--As the analysis in this paper indicates, the technology exists to perform cholesterol measurement in community settings with "desk-top" analyzers. Current data suggest that the cost of screening in community settings with such technology is lower than charges for such procedures in physicians' offices and laboratories. However, there currently is no mechanism by which Medicare pays for medical services offered in community facilities, such as churches or senior citizens' centers. If Medicare covered cholesterol screening in these settings, HCFA would have to develop reimbursement policies for them. As suggested in OTA's earlier analysis of glaucoma screening for the elderly, HCFA might pay the sponsors of community screening programs--hospitals, nonprofit organizations, etc---a set rate per patient for all Medicare beneficiaries screened (96). Because the accuracy and precision of desk-top analyzers are, in part, a direct function of the proficiency and care of individuals using the technology, policy makers would also need to consider how to monitor the quality of testing in community settings.

Costs and Effectiveness of Cholesterol Screening

Is routine cholesterol screening a cost-effective approach to the prevention of coronary heart disease in the elderly? Cost-effectiveness analysis usually assesses the cost associated with a defined increase in a measure of benefits. In health care, the most commonly employed measure of effectiveness is the change in life expectancy (or "quality-adjusted" life expectancy) brought about by a health intervention. However, the cost-effectiveness ratio (the ratio of the incremental costs of the interventions to the incremental health effects) is undefined when there are no health effects or when the intervention has deleterious effects on health.

Because there have been no randomized controlled trials of the health effects of cholesterol reduction in the elderly, particular weight must be placed on observational and epidemiologic data about cholesterol as a risk factor in the elderly. As reviewed above, cholesterol is not as powerful a risk factor for CHD in the elderly as it is in the middle-aged. Furthermore, epidemiologic studies have found that the cholesterol level is either not associated with overall mortality rates or is inversely associated with all-cause mortality. In addition, randomized controlled trials of the health effects of cholesterol reduction have not included elderly participants. It would be difficult to infer from available evidence that elderly individuals with an elevated blood cholesterol level would benefit from cholesterol reduction, even if the cholesterol could be lowered without side effects from medication or dietary change.

However, several developments may increase the effectiveness of cholesterol screening in coming years. First, cholesterol measurements in clinical laboratories and in other

settings are likely to become more accurate, in large part because of the efforts of the Laboratory Standardization Panel of NCEP. Standardization of high-density lipoprotein and low-density lipoprotein measurements is likely to improve as well, and one or both of these lipoproteins may become the primary screening tests for CHD risk in the elderly. The powerful new medications to lower cholesterol that have recently become available seem to have few short-term side effects and may prove to be more effective at lowering cardiovascular risk than previously available treatments. If studies demonstrate that cholesterol-lowering interventions reduce CHD and all-cause mortality among the elderly, the rationale for screening could become more persuasive.