

Appendix B

Summary of OTA Studies of Preventive Services for the Elderly

The Office of Technology Assessment has conducted a number of assessments of preventive services for the elderly over the past decade. This section summarizes the main findings of each study.

Breast Cancer Screening

OTA conducted an analysis of the effectiveness and costs to Medicare of breast cancer screening for Medicare beneficiaries in 1987 (89). It was estimated that a screening program begun in 1987, in which 30 percent of female Medicare beneficiaries ages 65 to 74 accepted annual screening, would result in avoidance of about 2,500 advanced-stage breast cancers every year from 1990 to 2020, with a total of 85,041 advanced-stage breast cancers prevented and 268,000 life-years saved by 2020. As far as costs to Medicare are concerned, the analysis showed that breast cancer screening cannot be expected to save enough money in decreased treatment costs to offset the costs of screening and workups. There are savings due to a reduction in initial and terminal treatment costs for breast cancer, but the cost of screening far exceeds these savings. The analysis found that a breast cancer screening program would cost Medicare about \$185 million in 1990. The cost to Medicare per life-year saved by 2020 (costs discounted at 5 percent, life-years undiscounted) would be approximately \$13,200.

Pneumococcal Vaccine

OTA analyzed the cost-effectiveness of the pneumococcal vaccine in elderly people (86,88). In 1983, the estimated net discounted costs per discounted healthy year of life gained (at 5 percent discount rate) ranged from negative net costs to \$6154, depending on the assumptions adopted regarding the percent of pneumonias that are pneumococcal and the duration of immunity conferred by the vaccine.

Influenza Vaccine

OTA performed a retrospective analysis of the cost-effectiveness of the influenza vaccination among elderly people in the 1972-78 period (87). The annual vaccination was found to be cost-saving to the medical care system when costs were discounted at 5 percent per year. If medical care costs for unrelated illnesses occurring in extended years of life gained from the vaccination are included, the vaccination would have cost \$1,782 per added healthy year of life.

Cholesterol Screening

In a study of the effectiveness and costs of cholesterol screening in the elderly, OTA found that the cholesterol level does *not* appear to be a significant predictor of

overall survival in either elderly men or women (33). The few studies of the elderly found either that the cholesterol level does not predict mortality at all or that it is a statistically significant predictor of lower mortality. There are no randomized trials of the impact of cholesterol reduction in the elderly, so the effectiveness of treatment must be inferred from the studies in middle-aged populations. While cholesterol reduction can reduce CHD incidence and death in middle-aged men, it has not been shown to lower overall mortality in this population. It may be that the studies on which such findings have been based have had insufficient power or too few years of followup, but benefits delayed for many years might not be pertinent to the elderly, who have a high rate of death from other causes.

The equivocal nature of the evidence on the effectiveness of cholesterol screening and treatment in the elderly must be considered in light of the potential costs associated with this preventive intervention. If all people 65 years of age and older were to fully comply with the National Cholesterol Education program's (NCEP) Adult Treatment Panel Guidelines, the annual national health care expenditures associated with screening and treatment would range from at least \$2.9 billion to \$14.2 billion, depending on the prevalence of certain risk factors and the mix of drugs prescribed. The costs of screening and followup alone are a small fraction of that total, about \$57 million per year. Drugs and monitoring services constitute the bulk of the annual health cost burden.

Medicare's share of national health expenditures for cholesterol screening and treatment is likely to be high. If the entire elderly population were to fully comply with the NCEP guidelines, Medicare expenditures for testing and monitoring would range from \$1 billion to \$5.4 billion per year.

Cervical Cancer Screening

OTA evaluated the costs and effectiveness of screening for cervical cancer among elderly women (64a). Studies have found that women who have been screened are two to ten times less likely than others to develop cervical cancer. The protection associated with prior screening is found in elderly women as well as younger women. Elderly women, however, are less likely to be screened than younger women and have seen less reduction in mortality rates than other groups. Medicare coverage of Pap smear screening (which was mandated in the Omnibus Reconciliation Act of 1989) might induce increased utilization of this test among elderly women. Additionally, Pap smear screening in elderly women does not appear to be very costly for the potential life years saved from this technology, although it is unlikely to actually save health care costs.

OTA estimated that a single screening of women at age 65, when they become eligible for Medicare, would save 14,400 life-years per 1 million women screened (life-years and costs discounted at 5 percent) and would cost the health care system \$1,666 per year of life saved. The incremental cost per year of life saved is least for 5-year screening (\$1,453) and is progressively greater as screening frequency increases. It amounts to \$5,956 per life-year saved for the incremental effects of a 3-year screening cycle over a 5-year cycle, and rises to \$39,693 per life-year saved for annual screening.

The cost-effectiveness ratio for Pap smear screening depends heavily on the extent to which high-risk, rather than low-risk, women are screened. Low-risk women derive some benefit from screening, but at very high cost to the health care system. Screening only high-risk women, on the other hand, has a very low cost per life-year saved.

Glaucoma Screening

OTA examined the existing evidence regarding the effectiveness and potential costs to Medicare of screening for open angle glaucoma (OAG) in the elderly (70). Three methods of screening for OAG exist: tonometry, which measures intraocular pressure (IOP); ophthalmoscopy, which identifies abnormalities of the optic disc; and perimetry, which identifies visual field defects. None of the methods has been tested for accuracy in everyday

office settings, and all have the potential to be highly inaccurate. Tonometry, for example, produces many false positives and negatives because elevated IOP and OAG are not always related. Although tonometry itself is inexpensive, diagnostic workups of individuals with false positive tests and treatment of many people who would not have developed OAG in any case result in substantial associated costs.

The accuracy of screening tests is not the only source of uncertainty. Considerable uncertainty also surrounds the effectiveness of medical treatment in preventing visual disability in individuals with high IOP or suspected OAG. The published, objective evidence on the effectiveness of treatment is highly contradictory. Many individuals suffer progression of disease despite treatment; conversely, many untreated persons go for years without suffering loss of vision. Few adequate studies of treatment have been undertaken, and those available do not show consistent results. Studies currently underway may help resolve the uncertainty.

Screening elderly individuals for OAG may well eventually prove to be a highly beneficial technology. At present, however, the contradictory evidence on the effectiveness of treatment, combined with the unknown accuracy of screening tests, makes widespread screening of the elderly a very uncertain, and probably costly, endeavor.