HEALTH PROMOTION AND AGING
"PREVENTIVE HEALTH SERVICES"

Gregg Warshaw, M.D.
Division of Geriatric Medicine
Department of Family Medicine
University of Cincinnati Medical Center

The problems of old age pose an unprecedented challenge to health professionals. The potential of preventive health care to contribute to the wellbeing of the elderly, to result in economic savings due to caring for a less disabled population, and to provide a more humane, less technological approach to medical care, has aroused considerable interest. Health maintenance of the elderly, nevertheless remains a complex, controversial and emotional topic.[1] Fundamental to the successful application of preventive strategies for the elderly is an understanding of the scope of prevention as it applies to the elderly.[2]

Patterns of disease and functional limitations are related to the demography of the elderly population.[3] Life expectancy statistics by age, race and sex demonstrate that after reaching age 65 Americans have considerable mean life expectancy. For example, 75 year old white women can be expected to live a mean of 12 more years; 75 year old black men can be expected to live a mean of 9 more years.[4] This remarkable expectation for additional life emphasizes the opportunities for disease prevention among the old.

The most common causes of death among individuals over the age of 65 are heart disease and cancer with heart disease accounting for nearly half of all deaths. Cancer deaths are mainly due to colon, breast, uterus, prostate cancer, and leukemias. Other common causes of death include injuries, pneumonia, diabetes, and pulmonary disease.[4]

In 1977, adults 65 years of age and over had 14.5 bed-disability days, and in 1984 15.1 days.[5] Chronic medical conditions are significant contributors to functional impairment. Common chronic impairments include arthritis, hypertension, hearing loss, heart disease, vision loss, and diabetes.[6] Recent reviews emphasize the importance of identifying factors that increase or decrease the probability of an "impairment" becoming a "handicap".[7-9] Some common handicaps in the elderly include immobility, inability to dress, inability to bathe, and inability to use the toilet. An accumulation of handicaps leading to dependence is a strong predictor of the need for long term care services.

TASKS OF PREVENTIVE HEALTH SERVICES

Effective health maintenance of the elderly requires that a number of tasks be performed by many sectors of society. Although this paper focusses primarily on the job of the health care provider; the elderly themselves, their families, and private and public health systems all contribute to health maintenance. Adoption of a healthy lifestyle by individuals in middle age could contribute greatly to health in later years. Successful aging requires life-long self-development and adaptation to loss. Individuals who plan and respond to expected and unexpected financial and social stress may be able to avoid the problems of isolation and depression.

Families, friends, and other social supporters have the challenge of providing informal and formal support while respecting the older person's autonomy. Over-protection by support interventions that occur prior to real need may inadvertently encourage dependency and accelerate functional loss.

Government and other purchasers of health services have the responsibility to find effective preventive health strategies and encourage their application. For example, Medicare limits payment for preventive health maneuvers, and routine vision, hearing, and dental examinations. Somer's has recently emphasized that selective funding of preventive interventions for the elderly by Medicare may represent an effective "cost control" strategy for the federal government. Somer's has also described the potential of governmental incentives for responsible consumer health behavior.[10]

Combatting agism is a task that the elderly, their families, health care providers, and the government share. There remains a widespread belief that people in their 60's or 70's are too old or disabled for effective preventive health care.

In their progress toward a rational and effective preventive approach for geriatric care, clinicians must clarify the complexities of applying anticipatory strategies to this age group. In addition strategies addressing the prevention of specific diseases, health maintenance plans for the elderly should include: a re-evaluation of the traditional preventive health delivery systems, personalized health maintenance measures, reduction of iatrogenic problems, addressing the needs of family caregivers, strategies to enhance functional status, and strategies to strengthen social supports.

The purpose of this paper is to discuss the guidelines by which preventive health services should be applied to this older age group; to review clinical trials in which health maintenance packages have been applied to the elderly population; and to provide a guide to potential preventive health maneuvers.

PRINCIPLES OF APPLYING HEALTH MAINTENANCE STRATEGIES TO THE ELDERLY

Scientific Validation of Maneuvers

Ensuring a sound scientific basis for a preventive health intervention has been addressed in recent years by McKeown[11], Cochrane and Holland[12], Spitzer[13], Sackett[14,15] Frame and Carlson[16,17] and the Canadian Task Force on the Periodic Health Examination[18,19].

This work has been essential in protecting the healthy population from iatrogenic insult, preventing unnecessary costs both to the individual and to society, and to maintain the "scientific integrity" of the professionals concerned. It has led to careful study of the impact of disease, the efficacy of detection maneuvers and the quality of evidence supporting the effectiveness of intervention strategies.

The focus of this work has been on early diagnosis through secondary prevention or screening.[15] Recommendations have also been made in the area of primary prevention, such as immunizations. Screening includes large public health programs; for example, checking blood pressure at the senior center. The combination of several tests as a screening package is referred to as multiphasic screening. The periodic health examination is when screening occurs as a preventive health visit in the physicians office. When preventive health services occur as part of ongoing acute or chronic health care this is referred to as case

finding.[20] For example, a 75 year old man presenting with acute bronchitis also has his blood pressure checked and is given guiac cards to take home to check for occult blood in the stool.

These strategies focus on the detection of asymptomatic disease. Yet, the relevance of this work to the elderly is somewhat limited, for it has focussed on primary and secondary prevention strategies for biomedical disorders in young populations. This is useful insofar as old age is not a separate period of life but part of a continuum, and for full effectiveness preventive measures need to start in childhood and continue throughout adult life. Nevertheless it does not provide the practicing clinician with a course of action when confronted with frail, elderly patients.

Personalize Preventive Health Services

The elderly are a heterogenous population and their health care must be personalized. In doing this, the following principles should be considered:

Recognize that Death May be a Legitimate End Point: A patient's right to benefit from the developments of medical science is incontestible but at some point in the life cycle, however, a patient has the right to die peacefully and with dignity. This is particularly true for those suffering from irremediable disease. Preventive health care of the elderly, therefore, has as its principal goal not simply the prolongation of life but improvement of the quality of that life.

Minimize Unnecessary Disruption to Life Style: A number of preventive health measures have the potential for disrupting a patient's life. Prescribing a low-sodium or weight-reduction diet, or urging the patient to stop smoking are examples. While these measures have a place in the management of selected groups of patients, the clinician must appreciate that in old age, when the chance of prolonging life is limited, the quality of that life is more relevant. Many patients see restriction of diet or the cessation of smoking as seriously affecting what enjoyment they have left in life. These emotional issues regarding life satisfaction must always be balanced against the theoretical advantages to health. If independently living elderly so wish, they need not comply with the prescribed preventive health measures. Institutionalized elderly are less fortunate and can be prisoners to the zealous application of preventive strategies.

Respect Patients' Autonomy: As elderly patients age they become more frail and may be at risk living alone. A patient's family may become sufficiently anxious about the risk that they try to institutionalize the old person. Despite the expressed wish of the patient to remain in his own home. The clinician at these times must respect the patient's right to self-determination. The exception to this is the case of the mentally incompetent patient (although the presence of dementia does not necessarily imply incompetence).

Time the Intervention Precisely: There is a critical intervention time, or "window", when the various types of preventive support should be provided. A patient's functional status may deteriorate slowly for several years until a crisis develops, then the patient's health deteriorates rapidly. If support is provided too late, institutionalization is often the outcome. If it is provided too early, it fosters dependency, wastes resources, is costly, and is considered by many patients to be an intrusion on their privacy.

Minimize Iatrogenic Insult

There is decline in physiological functioning in almost every organ system in the elderly which results in impaired homeostasis. Reduction of iatrogenic insult is therefore an important goal of health maintenance. Drug induced disease is perhaps the most commonly seen problem, but even the hospitalization process is not without risk for this age group. More and more literature[21,22] reveals significant iatrogenesis from the procedures used including nosocomial infections, falls within the institution and psychologic insult associated with relocation.[23]

Reduction of iatrogenic insult should not only be a goal of health maintenance but should be a principle by which health maintenance strategies are applied. For instance the Hemoccult Slide Test has been recommended for the detection of colorectal carcinoma in those over age 50 years yet is far from ideal as a routine test for use with the frail elderly. In this population the majority of positive tests may not be due to carcinoma but to asymptomatic diverticular disease or duodenal ulceration.[24] This is important because the Hemoccult is not an innocuous test. A positive result mandates an extensive work up from sigmoidoscopy to double contrast enema and colonoscopy. Morbidity in the elderly resulting from these procedures, from the required bowel preparation and from any accompanying hospitalization is significant. These factors must be weighed in the balance when considering the routine use of the Hemoccult Test for the frail but asymptomatic elderly population.

STRATEGIES FOR APPLYING HEALTH MAINTENANCE MEASURES

Screening and Case Finding in the General Population

The conventional approach to applying preventive care strategies is annual or regular screening programs. In the elderly this has been extended to identifying symptomatic but unreported illness by case finding. A number of reports over the last thirty years have suggested the benefit of screening elderly populations. Rubenstein, et al. have recently reviewed published reports of screening programs for the elderly living in the community.[25] Among elderly populations screening has consistently identified significant numbers of active clinical problems. However, the clinical significance of these findings depends on the characteristics of the population being screened, and only a few studies have attempted to measure the effectiveness of screening or case finding among the elderly[26] and only one used a randomized design.[27] This clinical trial involved 295 British patients living in the community. The screening intervention was a traditional medical history (obtained by a nurse and a questionnaire) and a physical exam. The study group increased its use of health and social services but had a decrease in use of in-hospital days as compared to controls. There was no identified impact from screening on physical or social disability. The reliability and validity of the scales used to measure outcomes in this study were not defined.

Screening of the community living elderly may slightly improve mortality rates, but the results remain inconclusive.[28,29] Screening has even less impact on functional status with only marginal non-statistical improvements being observed though in some of the studies the reliability and validity of the scales used to measure the outcomes have not been well defined. Most investigators believe their patients benefit from a screening program and report a perceived increase in patient morale and esteem but these subjective impressions have not been borne out when more sophisticated measurements have been used.[29] At best screening programs for the elderly have been demonstrated to have a marginal and transient effect at best on the quality of life.

Screening of the institutionalized elderly has been reviewed in a number of recent studies. In one study it was found that approximately half of the annual screening examinations produced either a new finding or clarification of an old problem.[30] These new findings were then assessed independently for their degree of importance by the patient's primary care physician. It was estimated that 3.4 per cent were of major importance, 26.8 per cent were of intermediate importance, and 69.8 per cent were of minor importance. These results provided only modest support for endorsing annual medical examinations for nursing home residents. In another survey of an academically affiliated Veterans' Administration Nursing home it was likewise concluded that ongoing health care as part of an academic geriatric program might obviate the need for annual screening or physical examinations.[31]

Levinstein, et al. reviewed the yield of routinely performed panels of laboratory tests in a large, non-profit community skilled nursing unit.[32] They concluded that in their population a CBC, serum electrolytes, urea nitrogen, creatinine, serum glucose, thyroid function tests, and a urinalysis would be beneficial to a substantial number of patients if performed as part of routine care or as annual screening test. The identification and erradiction of asymptomatic bacteriuria was a common result of this screening program, and the authors do state that the value of treating asymptomatic bacteriuria in this population has not been proved. It has been pointed out that none of the recommended tests have also been recommended by the Cannadian Task Force for this age group.[33]

In summary, current evidence for the efficacy of screening and case finding in general populations of community living or institutionalized elderly remains weak.

Screening and Case Finding in Selected Patient Groups

Rather than screen the whole of the elderly population, an alternative is to focus on selected patient groups. The elderly may self-select. For instance, a postal questionnaire has been used to allow those fit enough and with no significant problems to exclude themselves from further study. By using this self-report technique, about a fifth of a screening workload can be avoided.[34]

The results of several pre-admission screening programs suggest that referral for nursing home-type care is a further opportunity for the instigation of health maintenance measures as part of a multidimensional assessment. Apart from bringing to light undetected disease the subsequent rehabilitation and provision of home supports can do much to avert or delay institutionalization and allow resettlement (of the patient) at a less intense level of care.

Another method is to select only those elderly patients perceived to be "at risk". The concept of "risk" has at least two problems. First, the term has been used variously to imply risk of death, risk of increased morbidity, or risk of being institutionalized, all stigmatizing and stressful to the patient. Second, attempts to validate "at risk" groups previously defined in the world literature failed to find any of the definitions particularly effective for case finding.[35]

Periodic Health Examinations

A final strategy for the application of health maintenance measures is opportunistic case finding, that is seeking out unreported illness during normal doctor-patient interactions. This has been shown to be particularly effective where the health care delivery system has a strong primary care base with

primary care providers serving a defined population and acting as "gatekeepers" to a variety of resources. In this way over 90 per cent of an identified elderly patient population may make contact with the primary care base over a one year period.[36] The concept offers both a challenge and opportunity to primary care providers particularly those operating within health maintenance organizations.

Opportunistic case finding also removes the artificial dichotomy between preventive and traditional medical care. Health maintenance measures would no longer be a separate activity performed on a relatively fit population. Health maintenance and traditional medical care thus become integrated and the medical process serves as a major channel for the delivery of preventive health services. Sommer's has suggested that all new Medicare enrollees be required or encouraged to register with a primary physician. Identification of efficacious preventive services and fostering them through Medicare reimbursement is required to implement this strategy.[10]

POTENTIAL PREVENTIVE HEALTH MEASURES

Effective preventive health care of the elderly requires an appreciation of problems outside the narrow focus of primary and secondary prevention. Health in old age consists of three interwoven components: the absence of disease (including iatrogenic disease), an optimal functional status, and an adequate support system. Preventive health services for the elderly should intend to achieve the following goals:

1. Prevent or palliate physical, psychiatric, and iatrogenic disorders.
2. Prolong the period of effective activity and independent living.
3. Ensure a support system adequate to preserve the patient's autonomy, independence, and quality of life at all levels of care.
4. Avoid institutionalization as far as is practical in both humanitarian and economic terms.
5. Ensure that when illness is terminal there is as little distress as possible to patient and caregivers.
6. Minimize the burden on family and other caregivers in order to improve their morale and prolong the period of time they are willing to be caregivers.

Kane and colleagues have developed a framework for developing and evaluating preventive interventions for the elderly.[37] They emphasize that the traditional terminology of prevention is not easily applied to a patient group with chronic diseases. Four groups of potentially preventable clinical problems are outlined: 1) problems that can be addressed in traditional prevention terms (diseases that fit into the usual primary, secondary, tertiary prevention concepts), 2)behaviors likely to produce beneficial or adverse effects on health status (risk factor modification), 3)problems requiring attention from caregivers (case finding and anticipatory care of common geriatric functional problems), and 4) iatrogenic problems. Table 1 lists items relevant to the elderly in each of these four categories. Selected items are discussed below.

TRADITIONAL PREVENTION

Clinical Problem: Bacteriuria
Proposed Preventive Measure: Periodic urine examinations

Therapy has been shown to be effective in erradicating asymptomatic bacteriuria in elderly women[38]. However the effect of this treatment on morbidity and

mortality is unclear. Several studies have suggested a mortality risk associated with bacteriuria among institutionalized elderly.[39-41] However, others have found bacteriuria to be transient and to frequently resolve without treatment.[42]

Clinical Problem: Breast Cancer
Proposed Preventive Measure: Periodic Mamogram

The age-specific incidence of breast cancer, that is the number of cases per year per hundred thousand females in each age group, shows a progressive rise with age. A recent carefully conducted trial from Sweden showed that prognosis was best when the age at diagnosis was between 45 and 49 years, but thereafter survival worsened with increasing age.[43] The difference in relative survival between those older than 75 and those 45 to 49 years increased from 8.6 percent at two years, to 12.2, 20.3 and 27.5 percent after five, ten and fifteen years of follow up respectively. No data are available on the screening of the very old for breast cancer, but case-control studies from Europe indicate a value for mammographic screening in reducing mortality in patients up to 74 years of age.[44,45]

Clinical Problem: Cervical Cancer
Proposed Preventive Strategy: Periodic Pap Smear

The value of regular screening for cervical cancer by use of the Pap smear may decrease in old age. It is suggested that when clinicians are confronted by elderly women with a history of previous normal Pap smears they should repeat this procedure an additional time. If the test is negative, no further screening seems to be required for the age-specific incidence of conversion from negative to positive smears decreases from 0.3 per thousand in women 55 to 59 years old to 0 for those over 80.[46] However, 15% of women aged 65 to 74 years and 38% of women 75 years and older report never having had a Pap smear.[47] These women may require periodic screening.

It is also known that urban, black and hispanic populations have a high incidence of cervical carcinoma as do those with multiple sexual partners, prior venereal disease and those in the lower income group. It may be that screening of these high risk groups should be more aggressive. In a recent survey of an elderly New York population the prevalence rate of abnormal smears was found to be 13.5 per thousand.[48]

Clinical Problem: Colorectal cancer
Proposed Preventive Measure: Six-slide occult blood test: sigmoidoscopy

Colorectal cancer is common in the elderly; peaking in incidence at about age 80.[49] Five year survival rates appear to be similar for older as compared to younger victims. Sigmoidoscopy is recommended by the American Cancer Society (ACS) every three years after the age of 50.[50] The cost and the poor patient acceptance of this test has been discussed.[17] Its acceptance and complication rate in older subjects has not been sufficiently studied.

The ACS and the Canadian Task Force have recommended annual stool occult blood testing. Two large controlled trials have reported promising preliminary results.[51,52] A positive test requires follow-up sigmoidoscopy and barium enema or colonoscopy. The test only detects fecal blood, and in the elderly many false positives will result in lower bowel examinations. The morbidity in the elderly from these procedures, from required bowel preparation and from any accompanying hospitalization may be significant.

Clinical Problem: Endometrial Cancer
Proposed Preventive Measure: Patient education to report postmenopausal bleeding

The incidence of endometrial cancer increases with age.[53] Risk factors include obesity, estrogens, and infertility. This cancer appears to develop over years from endometrial adenomatous hyperplasia. Abnormal endometrial bleeding is found in 80% of women with this cancer;[54] and many of these cases are detected in early stages.[55] Endometrial tissue sampling has been recommended for high risk women.

Clinical Problem: Lung Cancer
Proposed Preventive Measure: Periodic chest x-ray

In the general population the ACS and the Canadian Task Force do not recommend routine screening chest x-rays. Reducing tobacco use is the best method of preventing lung cancer.

Clinical Problem: Ovarian Cancer
Proposed Preventive Measure: Annual pelvic exam

Ovarian cancer is aggressive; early metastatic disease is common. The incidence of this cancer increases with age.[53] Early detection of this cancer can lead to five year survival rates approaching 80%.[56] Unfortunately, there is no evidence that annual pelvic examinations will detect early cancers or improve survival rates.[57]

Clinical Problem: Prostate Cancer
Proposed Preventive Measure: Digital rectal exam

Prostate cancer is common among elderly men; and is the third leading cause of cancer death among men.[53] The natural history of this cancer in elderly men is poorly understood. Autopsy results show Stage A (occult) disease to be very common; and how many of these Stage A cancers progress to clinically significant disease is unclear. Studies supporting routine rectal examinations have not included many elderly subjects,[58] and a recent review of a screening program with over 2000 subjects concluded that rectal examination is an insensitive screening test for early prostate cancer.

Clinical Problem: Hypertension
Proposed Preventive Measure: Periodic Blood Pressure Check

In recent years there have been several clinical trials of the treatment of systolic-diastolic hypertension that have included patients over age 60.[59,60] The European Working Party on High Blood Pressure in the Elderly reported a significant decrease in cardiac mortality in the treatment group, a non-significant decrease in cerebrovascular mortality, and a no difference in overall mortality.[59,61] Other studies have demonstrated a reduction in the incidence of stroke disease.

Hard evidence is still confined to those under 80 years of age for there has been insufficient numbers of the very old enrolled in the existing trials from which to draw statistical conclusions. There is therefore still doubt about the risk-benefit equation of treatment in the very old away from the carefully monitored conditions of a controlled trial. It is the very old population that is most at risk from excessive or rapid hypotensive therapy as well as from the side effects of the medication. Compliance with therapy in the general elderly population may

not be as good as in the relatively fit, motivated elderly populations attending blood pressure clinics. This may be particularly true in the case of the very old population in whom 1 in 5 will have some degree of cognitive impairment. Effective prevention of the complications of hypertension still requires considerable research into strategies with the old old.

The case for treating isolated systolic hypertension is not as yet proved and awaits the result of two ongoing controlled trials.

Clinical Problem: Influenza
Proposed Preventive Measure: Influenza Vaccine; Amantadine

There is good evidence of the efficacy of influenza vaccine in the community living elderly and moderately good evidence for its efficacy in the institutionalized elderly population.[62-64] Influenza vaccination reduces mortality, morbidity and hospitalization rates. However vaccination rates remain low though a number of strategies such as postal and telephone reminders have improved compliance with this procedure.

Amantadine hydrochloride is an antiviral agent that is specific for influenza A. Amantadine has been 70-90% effective in preventing influenza A illness in an institutional outbreak.[65] Amantadine is recommended by the C.D.C. for high risk individuals allergic to vaccine, as an adjunct to late immunization of high-risk individuals, and during nursing home epidemics.

Clinical Problem: Pneumonia
Proposed Preventive Measure: Pneumococcal Vaccine

Studies suggest the efficacy of pneumococcal vaccination in the elderly.[66] The appropriateness of widespread vaccination programs must, however, be seen in the context of the populations for which they are recommended. It is essential to consider the effect of other concomitant disease on mortality rates from pneumococcal pneumonia. When no other conditions co-exist the mortality from pneumococcal pneumonia is low (9/100,000 cases), but this increases a hundred fold for those with two or more high risk associated conditions. Therefore, two target populations may exist. One fit group, mostly living in the community, who respond well to antibiotic therapy and who have a good prognosis irrespective of vaccination status. The second group, many of whom will be institutionalized, are seriously debilitated from concomitant disease, have a poor prognosis, and prevention might be better than attempted cure. It should also be noted that it is in precisely this frail population that there are still doubts about the efficacy of the vaccine.[67]

Clinical Problem: Tetanus
Proposed Preventive Measure: Tetanus Toxiod Immunization

Most cases of tetanus in the United States occur in individuals over the age of 60.[68] Inadequate immunization status among the elderly has been documented and is felt to be the cause for the relatively high attack and fatality rates among the elderly.[69] However, the overall incidence rate for tetanus is very low; 0.2/100,000 for individuals over the age of 60. The cost-effectiveness of large tetanus immunization programs for the elderly should be evaluated.

Clinical Problem: Hypothyroidism
Proposed Preventive Measure: Periodic T4, TSH measurement

Hypothyroidism is present in about 1 in 500 of the community-living adult population,[70] but the incidence increases with age so that it is a condition commonly encountered by those physicians dealing with the elderly.[71,72] Bahemuka and Hodkinson found it in 2.3 per cent of consecutive admissions to a geriatric department.[73] Because of its frequency, its impact on physical and psychiatric morbidity, the simplicity and low cost of the test for its detection, and the efficacy of its treatment, periodic evaluation of thyroid function in an aged population may be a useful health maintenance strategy.

Clinical Problem: Tuberculosis
Proposed Preventive Measure: Periodic PPD skin testing or chest x-rays

Persons 60 years and older account for 25 - 50% of all cases of tuberculosis.[74-76] Reactivation tuberculosis is a major mechanism for active disease. With advancing age, the frequency of false negative PPD skin tests in the presence of active disease increases. Chest x-rays are not currently recommended for the purpose of screening to detect tuberculosis.[77] Because of the risk of liver toxicity INH chemoprophylaxis for elderly PPD convertors or for exposed contacts with negative chest x-rays is controversial.[69] Prevention of tuberculosis outbreaks in nursing homes requires careful evaluation of PPD reactivity status at the time of admission and aggressive infection control measures if an active case is identified.

RISK FACTORS OR BEHAVIORS

Clinical Problem: Hypercholesterolemia
Proposed Preventive Measures: Routine screening for blood lipids

Recent studies supporting the screening for and the treatment of elevated cholesterol levels have been encouraging.[78,79] Lowering cholesterol levels through diet or medications is increasingly accepted as effective in preventing heart disease. The relevance of this work to individuals over age 70 is unclear. The Framingham study documents that the relationship between cardiovascular disease and cholesterol levels decreases with age.[80]

Clinical Problem: Smoking Habits
Proposed Preventive Measure: Advice and assistance to quit smoking

Although smoking rates tend to fall in old age, 17.9 per cent of men and 16.8 per cent of women of this age group in the United States still smoke.[81] Although the principle of minimizing disruption to the patient's lifestyle must be seriously considered, data suggest that in addition to its correlation with coronary heart disease, peripheral vascular disease, lung cancer, and chronic obstructive lung disease, smoking in the elderly is also associated with decreased bone mineral density, loss of body weight, decreased muscle strength, and accelerated lung aging. The demented elderly who smoke also pose a fire hazard.

The benefits of stopping smoking in younger patients has been well described. Recently Jajich has shown that stopping smoking late in life is associated with a rapid and sustained reduction in mortality from coronary disease.[82] Many programs are available to assist individuals to stop smoking. Although there may be isolated successes, their success in the elderly is generally poor.

CASE FINDING

Clinical Problem: Alcoholism
Proposed Preventive Measure: Historical screening

Although the data is difficult to obtain it is generally felt that alcoholism is a common and serious clinical problem among the elderly.[83] It is felt that as many as 1/3 of older people with alcoholism developed the disease in their later years as a result of physical or psychosocial stress. These patients may go unnoticed by health providers. Health workers should be aware of high-risk profiles; eg. possible" dementia", recent falling or fractures, depression.

Clinical Problem: Constipation
Proposed Preventive Measure: Historical Screen

Constipation, a problem more often perceived than real in the community-living elderly, nevertheless can result in psychological distress, impaction with overflow soiling, hemorrhoids, and diverticular disease. It may be managed by the maintenance of physical activity and an adequate fluid intake and by additional dietary fiber in the form of bread or supplements. Fiber may also protect against symptomatic diverticular disease of the colon.

Clinical Problem: General deconditioning with age
Proposed Preventive Strategy: Exercise programs

There is considerable potential for the maintenance of physical function in old age by physical exercise programs. Physical training programs have been shown to reduce the decline in maximum oxygen consumption that accompanies aging,[84] to increase muscle strength,[85] to improve joint mobility,[86] and to improve the sense of balance.[87] Imaginative yet acceptable exercise programs need to be developed and integrated into the social life of the elderly. Guidelines and precautions for the prescription of these programs have been described.[88] An unanswered question is whether the elderly population, particularly those that are frail, will have the motivation to carry out such exercise, frequently and at a sufficient level of intensity to achieve a conditioning response.

Clinical Problem: Dementia
Proposed Preventive Measure: Periodic screening by standard mental status test

The recognition of dementia in the elderly is important primarily to improve the behavioral and functional problems associated with the disease and to provide support to the caregivers. The identification of dementia at an early stage may assume increasing importance as research into new treatment modalities expands.

Clinical Problem: Depression
Proposed Preventive Measure: Periodic screening by questionnaire

Depression and dysphoria are common in the elderly and are amenable to antidepressant therapy, environmental manipulation, and other measures. As with dementia, the greatest hindrance to its management is lack of recognition. Increased awareness of depression as a treatable entity could be improved by identifying high risk sub-groups or by the inclusion of a short screening instrument into the routine clinical evaluation.

Clinical Problem: Breakdown of Family Support
Proposed Preventive Measure: Evaluate Family Stress

Families in most western societies provide over 80 per cent of all home health care for the elderly. In undertaking this caring role they often experience

significant burden which may result in adverse outcomes including psychological distress, physical illness, family disruption, increased institutionalization, increased consumption of community resources and, if no help is provided to them, abuse of the elderly. It is therefore in the best interest of everyone to avoid this breakdown of family support. A number of strategies could be established to minimize this burden (though evaluative research on these strategies is still in its early stages). Evidence is accumulating from a number of trials and demonstration projects that providing informal support services such as homemaker programs are of benefit not only in reducing stress but in preventing institutionalization.

Another type of support is respite care for selected groups of caregivers under stress. For families of the cognitively impaired , a resource is an in-home sitting service. Day care respite may also be of value particularly for the physically frail. Traditional in-patient respite care has been widely used for many years in the United Kingdom; however, there are still only descriptive studies evaluating efficacy. This efficacy is still being estimated in terms of ultimate prevention of long term care rather than improving the morale of the families concerned.

Clinical Problems: Falls
Proposed Preventive Measure: Anticipatory removal of environmental hazards, medication monitoring, etc.

Falls in the elderly are associated with significant morbidity, mortality and an increased rate of institutionalization.[89] Isaacs work from the United Kingdom shows that it is possible to identify those at high risk of falling based on an assessment of walking speed, extent of body sway and the extent to which the person mobilizes. A high correlation has been shown between a simple clinical score and more sophisticated biomedical measuring techniques in making these assessments.[90]

Although theoretical frameworks have been devised for the prevention of falls and check lists exist for the elimination of home hazards, the elderly themselves may be reluctant to make the necessary life style changes to reduce their chances of falling.

Clinical Problem: Foot problems
Proposed Preventive Measure: Routine podiatric care

Foot problems (nail abnormalities, calluses, bunions, ulcerations, etc.) are common among the elderly. It is clear that older people with peripheral vascular disease and/or diabetes require attentive foot care. In addition, many elderly are functionally unable to care for their own feet (vision, dexterity, reach, cognition). Preventive foot care may be beneficial to many elderly.

Clinical Problem: Hearing Loss
Proposed Preventive Measure: Hearing Screening

Hearing deficits in the elderly are common. The vast majority of patients are suffering from presbycusis, wax in the external auditory canal, or both. The first part of any screen for hearing deficit should consist of the clinician's exam and the assessment of pure tone hearing. Screening otoscopes can reliably identify patients for further evaluation. Improvements and modifications in design and construction of hearing aids have enabled a greater proportion of the hearing impaired elderly to benefit from amplification.

Clinical Problem: Poverty and Inadequate Housing

Proposed Preventive Measure: Income and housing programs

Many elderly are poor. Health maintenance strategies must allow for this by providing adequate income, not just because of the correlation between poverty, poor health, and limitation of activities, but to enable the elderly to cope with major problems within the health reimbursement structure. The latter include increasing out-of-pocket expenses for medical care, the lack of funding for hearing aids, glasses, walking aids, dental care, and so forth, and the need to spend-down almost to poverty level before receiving any supplementation for long-term nursing home care. Standard housing has an indirect effect on the health of many elderly and results in isolation, accidents in the home, and hypothermia.

Clinical Problem: Immobility
Proposed Preventive Measure: Rehabilitation

Although exercise programs may be considered a primary preventive strategy, rehabilitation and functionally oriented care are the main tertiary preventive strategies aimed at minimizing disability. Rehabilitation tends to be considered a specialist topic conducted by therapists and physiatrists often in specialized units remote from the mainstream of medical practice. It is also strongly biased toward the admission of younger age groups and has a work-oriented goal. The term functionally oriented care is therefore used in the context of the elderly, and it is the duty of nurses and physicians to conduct it as well as therapists. In many cases it is as effective as more specialized rehabilitative programs.[91,92]

Clinical Problem: Incontinence
Proposed Preventive Measure: Historical Screening

For the elderly without dementia, a high cure rate should be expected for incontinence,[93,94] yet there is considerable shame and reluctance about reporting this problem. A priority for the prevention of incontinence must therefore be to educate this older population and their caregivers that incontinence can be treatable. A simple clinical algorithm is available for the assessment of the elderly incontinent woman. This has been shown to correlate well with sophisticated urodynamic studies, and the approach may do much to remove the need for invasive procedures and hence reduce iatrogenic insult.[95]

The prevention of incontinence may depend on a wide range of other strategies such as improving the patient's mobility, improving access to and stability at the toilet, and, in the case of institutionalized patients, ensuring an adequate nurse-to-patient ratio to permit an effective toilet-training program.

In established incontinence in demented patients, cure is less likely, but considerable benefit may result from the correct use of behavioral strategies, specialized garments, appliances, and indwelling catheters. Implementing these measures may benefit by a community-based case-finding and surveillance program by nursing staff.

Clinical Problem: Insomnia
Proposed Preventive Measure: Historical Screen

As many as 30% of elderly persons complain of serious difficulty in falling asleep or remaining asleep. Sleep disturbance is particularly common in the nursing home, with most residents receiving prescriptions for sedative-hypnotics. Insomnia is commonly associated with concomitant medical problems, and careful evaluation is required. Nonpharmacologic treatment of insomnia can benefit many elderly.

Clinical Problem: Loss
Proposed Preventive Measure: Anticipatory Counseling

Death of a spouse or loved one carries a significant risk of morbidity and mortality for the bereaved. Several studies now show the benefit of bereavement counseling for the elderly,[96,97] and this may be considered a useful health maintenance measure. Similar support may be required for the caregivers of the demented elderly during the latter part of their illness.

Retirement has been estimated as the tenth most stressful event occurring over the life cycle. However, studies suggest that less than one third of persons have difficulties adjusting to it. The case for the benefit of preretirement counseling is unproved although satisfied retirees start thinking and planning for retirement at an earlier age.[98]

Clinical Problem: Nocturia
Proposed Preventive Measure: Historical Screen

Nocturia, may be precipitated by diuretics or the return of edema fluid from the limbs at night but many elderly have an uninhibited neuropathic bladder as the underlying pathophysiologic cause. This may be helped by the use of an anticholinergic agent such as flavoxate hydrochloride at night.

Clinical Problem: Relocation Stress
Proposed Preventive Measure: Anticipatory Counseling

There is now a sizable literature on the mortality and morbidity associated with relocation stress. Factors that seem to reduce these negative effects are the opportunity for choice, personal preparation for the move, and a perception of control in the decision-making process. Simple measures have been outlined to effect these goals.[99] When an elderly person relocates to another person's house, social stresses can possibly be prevented by giving advice on such matters as privacy, daily routine, financial responsibilities, and the sharing of household tasks.

Clinical Problem: Poor Vision
Proposed Preventive Measure: Vision Screening

About a fifth of those over 65 years of age have poor vision. This may severely restrict daily activities, result in social isolation, produce depression, and aggravate paranoid and delusional states. A simple test of vision carried out by relatively untrained personnel emphasizing near rather than distance vision (for example by the use of print charts) would uncover many problems that could then be referred to physicians for ophthalmoscopic examination. There is insufficient evidence at present to support routine screening for open angle glaucoma by tonometry.[17]

Apart from specific treatment such as cataract extraction or laser photocoagulation for senile macular degeneration or diabetic retinopathy, simple methods such as the provision of glasses or low vision aids can be of value. Much of the visual difficulty experienced by the elderly at home can also be relieved by improved illumination. One study found that the provision of a 60 watt bulb in a small lamp improved visual acuity in 82 per cent of the elderly subjects attending a low vision clinic.[100]

IATROGENIC

Clinical Problem: Iatrogenic Insult
Proposed Preventive Measure: Multiple Strategies

The prevention of iatrogenic insult is a priority in the health care of the elderly. Iatrogenic insult occurs throughout the complete range of medical management. Considerable benefit would arise by altering clinical behavior to prescribe drugs not only more skillfully but to prescribe them less, by the adoption of a stronger case-management principle throughout the numerous consults in the acute-care hospital, by adopting the principle of minimal interference in the medical work-up, and by the introduction of multidisciplinary geriatric assessment.

Portions of this paper were adapted from: Kennie DC, Warshaw GA. Health maintenance and health screening in the elderly. In: Clinical Aspects of Aging, 3rd edition. Ed: Reichel W. Baltimore: Williams and Wilkins, In Press.

TABLE I: POTENTIALLY PREVENTABLE GERIATRIC CLINICAL PROBLEMS

TRADITIONAL PREVENTION	RISK FACTORS OR BEHAVIORS	CASE FINDING	IATROGENIC
BACTERIURIA	DIET	ADL	DIAGNOSTIC
CANCER	(CHOLESTEROL)	ALCOHOLISM	TESTS
BLADDER	EXERCISE	CONSTIPATION	DRUGS
BREAST	OBESITY	DECONDITIONING	INTERACTIONS
CERVICAL	SEAT BELTS	DECUBITI	SIDE EFFECTS
COLO-RECTAL	SMOKING	DEMENTIA	INSTITUTIONS
ENDOMETRIAL	STRESS/LOSS	DENTITION	HOSPITALS
LUNG		DEPRESSION	NOSOCOMIAL
ORAL		FAMILY SUPPORT	INFECTION
OVARIAN		FALLS	NURSING HOMES
PROSTATE		FOOT CARE	
SKIN		HEARING	
DIABETES		HOUSING/INCOME	
FRACTURES/		IMMOBILITY	
OSTEOPOROSIS		INCONTINENCE	
GLAUCOMA		INSOMNIA	
HEART DISEASE		LOSS	
HYPERTENSION		NOCTURIA	
HYPO/		RELOCATION STRESS	
HYPERTHERMIA		SLEEP PROBLEMS	
INFLUENZA		VISION	
MACULAR			
DENGERATION			
PNEUMONIA			
STROKE			
TETANUS			
THYROID DISEASE			
TUBERCULOSIS			

BIBLIOGRAPHY

1. Kennie DC. Health maintenance of the elderly. Clinics in Geriatric Medicine 1986; 2:53-83
2. Warshaw GA. Prevention and the elderly. J Fam Prac 1986; 22:119-121
3. Winogrond IR, Duthie EH, Cadmus RR. Older Adults. In: The Preventive Approach to Patient Care. Ed. Sheridan DP, Winogrond IR. New York: Elsevier Science, 1987. pp. 97-143
4. US Dept of Health and Human Services: Advance report, final mortality statistics, 1983. Monthly Vital Statistics Report 1985; 34:6
5. US Dept of Health and Human Services: Health United States 1986. 1986; p. 12
6. US Dept of Health and Human Services: Current Estimates from the National Health Interview Survey: United States 1981. Washington, DC, National Center for Health Statistics 1982, vol 10, p. 141
7. DeFriese GH, Hersh AS, McManas MA. A proposed research agenda for health promotion and disease prevention for children and the elderly. Health Services Research. 1985; 19:1033-1041
8. Green LW. Some challenges to health services research on children and the elderly. Health Services Research. 1985; 19:693-815
9. Lee PR. Health promotion and disease prevention for children and the elderly. Health Services Research. 1985; 19:783-792
10. Somers AR. Why not try preventing illness as a way of controlling medicare costs? NEJM 1984; 311:853-856
11. McKeown T. Validation of Screening Procedures. In: Screening in Medical Care. Nuffield Provincial Hospitals Trust. London: Oxford University Press, 1968. pp. 1-13
12. Cochrane AL, Holland WW. Validation of screening procedures. Br Med Bull 1971; 27:3-8
13. Spitzer WO, Brown BP. Unanswered questions about the periodic health examination. Annals of Internal Medicine 1975; 83:257-263
14. Sackett DL. Screening for early detection of disease: to what purpose? Bull NY Acad Med 1975; 39-52
15. Sackett DL, Haynes RB, Tugwell P. Clinical Epidemiology. Boston: Little, Brown and Company. 1985
16. Frame PS, Carlson SJ. A critical review of periodic health screening using specific screening criteria: parts 1-4. J Fam Pract 1975; 2:29-36, 123-129, 189-194, 283-289
17. Frame PS. A critical review of adult health maintenance. J Fam Prac 1986; 22:341-346, 417-426, 511-520; 23:29-42
18. Canadian Task Force on the Periodic Health Examination. The periodic health examination. CMA Journal 122:1-46, 1979
19. Canadian Task Force on the Periodic Health Examination: The periodic health examination: 1984 update. Can Med Assoc J 1984; 130:1278-1285
20. Freer C, Almind G, Warshaw G, et al. Screening and case finding. In: Prevention of Disease in the Elderly. Ed: Muir Gray JA. Edinburgh: Churchill Livingstone, 1985. pp. 51-63
21. Steel K. Iatrogenic disease on a medical service. J Am Geriatr Soc 1984; 32:445
22. Jahnigen D, et al. Iatrogenic disease in hospitalized elderly veterans. J Am Geriatr Soc 1982; 30:387-390
23. Gillick MR, et al. Adverse consequences of hospitalization in the elderly. Soc Sci Med 1982; 16:1033-1038
24. Mangla JC, et al. Diagnosis of occult gastrointestinal lesions by stool guaiac testing in a geriatric hospital. J Am Geriatr Soc 1981; 29:473
25. Rubenstein LZ, Josephson KR, Nichol-Seamons M, et al. Comprehensive health screening of well elderly adults: An analysis of community program. J. of Gerontology 1986; 41:342-352
26. Lowther CP, MacLeod RDM, Williamson J. Evaluation of early diagnostic services for the elderly. British Medical Journal. 1970; 275-277
27. Tulloch AJ, Moore V. A randomized controlled trial of geriatric screening and surveillance in general practice. J. Royal College of General Practitioners. 1979; 29:733-742

28. Hendriksen C, et al. Consequences of assessment and intervention among elderly people: a 3 year randomized control trial. Brit Med J 1984; 289:1522
29. Vetter NJ, et al. Effect of health visitor working with elderly patients in general practice: a randomized control trial. Brit Med J 1984; 288:369
30. Irvine PW, et al. The value of annual medical examinations in the nursing home. J Am Geriatr Soc 1984; 32:540
31. Gambert SR, Duthie EH, Wiltzius F Sr. The value of the yearly medical evaluation in a nursing home. J. Chronic Dis 1982; 35:65-68
32. Levinstein MR, Ouslander JG, Rubenstein LZ, et al. Yield of routine annual laboratory tests in a skilled nursing home population. JAMA 1987; 258:1909-1915
33. Komaroff AL. Screening tests for nursing home patients. JAMA 1987; 258:1941
34. Barber JH, Wallis JB. The effects of a system of geriatric screening and assessment on general practice workload. Health Bull. 1982; 40(3):125
35. Taylor R, et al. The Elderly at Risk: A Critical Review of Problems and Progress in Screening and Case Finding. Research Perspectives on Ageing 6. Age Concern Research United Kingdom, 1983
36. Williams EI. Characteristics of patients aged over 75 not seen during one year in general practice. Brit Med J 1984; 288:119
37. Kane RL, Kane RA, Arnold SB. Prevention and the elderly: risk factors. Health Services Research. 1985, 19:945-1006
38. Boscia JA, Kobasa WD, Knight RA, et al. Therapy vs no therapy for bacteriuria in elderly ambulatory nonhospitalized women. JAMA 1987; 257:1067-1071
39. Boscia JA, Kobasa WD, Knight RA, et al. Epidemiology of bacteriuria in an elderly ambulatory population. Am J Med 1986; 80:208-214
40. Nordenstam GR, Brandberg CA, Oden AS. Bacteriuria and mortality in an elderly population. N Engl J Med 1986; 314:1152-1156
41. Dontas AS, Kasviki-Charvarti P, Chem L, et al. Bacteriuria and survival in old age. N Engl J Med 1981; 304:939-943
42. Boscia JA, Kobasa WD, Knight RA, et al. Epidemiology of bacteriuria in an elderly ambulatory population. Am J Med 1986; 80:208-214
43. Tabar L, Fagerberg CJG, Gad A, et al. Reduction in mortality from breast cancer after mass screening with mammography. Lancet 1985; 1:829-832
44. Collette HJA, Rombach JJ, Day NE, et al. Evaluation of screening for breast cancer in a non-randomized study by means of a case-control study. Lancet 1984; 1:1224-1226
45. Verbeek ALM, Holland R, Sturmous F, et al. Reduction of breast cancer mortality through mass screening with modern mammography. Lancet 1984; 1:1222-1224
46. Cervical cancer screening: The Pap smear. Summary of an NIH Consensus Statement. Br. Med. J., 1980; 281:1264
47. Celentano DD, Shapiro S. Weisman CS: Cancer preventive screening behavior among elderly women. Prev Med 1982; 11:454-463
48. Mandelblatt J, et al. Gynecological care of elderly women. Another look at papanicolau smear testing. JAMA 1986; 256:367-371
49. Patterson WB. Oncology perspective in colorectal cancer in the geriatric patient. In Yancik R, Carbone PP, Patterson WB, et al (Eds) Perspectives on Prevention and Treatment of Cancer in the Elderly. New York, Raven Press, 1983; pp 105-112
50. American Cancer Society: ACS report on the cancer-related health checkup. CA 1980; 30:194-240
51. Winawer SJ, Andrews M, Flehinger B, et al. Progress report on controlled trial of fecal occult blood testing for the detection of colorectal neoplasia. Cancer 1980; 45:2959-2964
52. Gilbertsen VA, McHugh R, Schuman L, et al. The earlier detection of colorecctal cancers, a preliminary report of the results of the occult blood study. Cancer 1980; 45:2899-2901

53. Young JL Jr, Percy CL, Asire AJ (eds): SEER Program: Incidence and mortality, 1973-77. National Cancer Institute Monograph 57, Washington DC, Government Printing Office, 1981, p. 75
54. Boon MI, Calvert JC, Gates HS. Uterine cancer screening by the family physician. Am Fam Physician 1984; 30:157-166
55. Jenson CB, Shahon DB, Wangensteen OH. Evaluation of annual examinations in the dectection of cancer. JAMA 1960; 174:1783-1788
56. Silberberg BS. Cancer statistics 1984. CA 1984; 34:7-23
57. Smith LH, Oi RH. Detection of malignant ovarian neoplasms: A review of the literature. Obstet Gynecol Surv 1984; 39:313-360
58. Gilbertsen VA. Cancer of the prostate gland: Results of early diagnosis and therapy undertaken for cure of the disease. JAMA 1971; 215:81-84
59. Hypertension Detection and Follow-up Program Cooperative Group: Five-Year Findings of the Hypertension Detection and Follow-up Programs. JAMA 1979; 242:2462
60. Amery A, Brixco P, Clement D, et al. Mortality and morbidity results from the European Working Party on High Blood Pressure in the Elderly Trial. Lancet 1985; 1:1349
61. Report of the Management Committee. The australian therapeutic trial in mild hypertension. Lancet 1980; 1:1261-67
62. Howells CHL, Jenkins-Vesselinova CK, Evans AD, et al. Influenza vaccination and mortality from bronchopneumonia in the elderly. Lancet 1975; 1:381-383
63. Barker WH, Mullooly JP. Influenza vaccination of elderly persons. Reduction in pneumonia and influenza hospitalizations and deaths. JAMA 1980; 244:2547-2549
64. Patriarca PA, Weber PA, Parker RA, et al. Efficacy of influenza vaccine in nursing homes: Reduction in illness and complications during an influenza A (H_3N_2) epidemic. JAMA 1985; 253:1136-1139
65. Atkinson WL, Arden NH, Patriarca PA, et al. Amantadine prophylaxis during an institutional outbreak of type A (H_1N_1) influenza. Arch Intern Med 1986; 146:1751-1756
66. Health and Public Policy Committee, American College of Physicians: Pneumococcal vaccine. Ann Intern Med 1986; 104:118-120
67. Simberkoff MS, et al. Efficacy of pneumococcal vaccine in high risk patients. New Engl. J. Med. 1986; 315:1318-1327
68. Division of Immunogenetics, Centers for Disease Control: Tetanus--United States, 1982-1984. MMWR 1985; 34:602-611
69. Yoshikawa TT, Norman DC. Aging and Clinical Practice: Infectious Diseases. New York: Igaku-Shoin, 1987. pp. 206-212
70. Evereel DC, Hall R. Hypothyroidism. Br Med J 1972; 1:290
71. Sawin CT, Deepak C, Azizi F, et al. The aging thyroid; increased prevalence of elevated serum thyrotropin levels in the elderly. JAMA 1979; 242:247-250
72. Tunbridge WMG, Evered DC, Hall R, et al. The spectrum of thyroid disease in a community: The Whickham survey. Clin Endocrinol 1977; 7:481-493
73. Behemuka M, Hodkinson HM. Screening for hypothyroidism in elderly patients. Brit. Med. J. 1975; 2:601
74. Page MI, Lunn JS: Experience with tuberculosis in a public teaching hospital. Am J Med 1984; 77:667-670
75. DeBuitleir M, Fitzgerald MN. The changing profile of tuberculosis in a general teaching hospital: A five-year review of 121 cases. Irish Med J 1982; 75:390-399
76. Dutt AK, Jones L, Stead WW: Short-course chemotherapy for tuberculosis with largely twice-weekly isoniazid-rifampin. Chest 1979; 75:441-447
77. Lordi GM, Reichman LB: Tuberculosis. When not to order roentgenograms. JAMA 1985; 253:1780-1781
78. Shekelle RB, Shryock AM, Paul O, et al. Diet, serum cholesterol, and death from coronary heart disease; the Western Electric study. N Engl J Med 1981; 304:65-70

79. Lipid Research Clinics Program. The lipid research clinics coronary primary prevention trial results: I. Reduction in incidence of coronary heart disease. JAMA 1984, 251:351-364.
80. Kannel WB, Gordon T. Cardiovascular Risk Factors in the Aged: The Framingham Study In: S G Havnes and M Feinbeb (eds.). Second Conference in the Epidemiology of Aging. DHEW Publication No. (NIH 80-969. Bethesda, MD: National Institutes of Health. 1980
81. Jajich CL, et al. Smoking and coronary heart disease mortality in the elderly. JAMA 1984; 252:2831
82. US Department of Health and Human Services. National Center for Health Statistics: Health United States 1983. DHHS Publication No. (PHS) 84-1232. Hyattsville, Maryland, 1984
83. Blazer DG, Penny Vacker MR. Epidemiology of alcoholism in the elderly. IN: Hartford JT. Sahorajski T (eds): Alcoholism in the Elderly. New York: Raven Press, 1984. pp.25-33
84. DeVries H. Physiological effects of an exercise training regimen upon men aged 52 to 88. J Gerontol 1970; 25:325
85. Aniansson A: Muscle function in old age with special reference to muscle morphology effect of training and capacity in activities of daily living, Departments of Rehabilitation Medicine and Geriatric and Long-Term Medicine, University of Goteborg, Sweden, 1980.
86. Frekany GA, Leslie DK. Effects of an exercise program on selected flexibility measurements of senior citizens. Gerontology 1975; 21:182,
87. Vanfraechem J, Vanfraechem R. Studies of the effect of a short training period on aged subjects. J Sports Med Phys Fitness, 1975 21:182
88. Council on Scientific Affairs: Exercise programs for the elderly. JAMA 1984; 252:544
89. Perry BC. Falls amoung the elderly. A review of the methods and conclusions of epidemiologic studies. J Am Geri Soc 1982; 10:167-171
90. Isaacs B. Clinical and laboratory studies of falls in old people. Prospects for Prevention. Clinics in Geriatric Medicine. 1985; 1:513-524
91. Feldman DJ, et al. A comparison of functionally oriented medical care and formal rehabilitation in the management of patients with hemiplegia due to cerebral vascular disease. J Chronic Dis 1962; 15:207
92. Stern PH, et al. Factors influencing stroke rehabiliation. Stroke, 1971; 2:213
93. Resnick NM. Management of urinary incontinence in the elderly. NEJM 1985; 313:800-805
94. Williams ME, Pannill FC. Urinary incontinence in the elderly. Ann Int Med 1982; 97:895-907
95. Hilton T, Stanton SL. Algorithmic method for assessing urinary incontinence in elderly women. Brit Med J 1981; 292:940
96. Gerber I, Weiner A, Battin D, et al. Brief therapy to the aged bereaved. In: Schoenberg G. and Gerber I. (eds). Breavement: Its Psychological Aspects. New York, Columbia University Press, 1975
97. Parkes CM. Bereavement counselling--does it work? Br Med J, 1980; 181:3
98. Howard JH, Marshall J Rechnitzer PA, et al. Adapting to retirement. J Am Geriatr Soc 1982; 30:488
99. Brubeck E, Walton R. When an elderly patient needs extended care. Geriatrics. 1979 (February), p. 93
100. Cullinan TR, Gould ES. Silver JH, et al. Visual disability and home lighting. Lancet 1979; 1:642