

Helping Smokers Quit

A Guide for Primary Care Clinicians

Smoking kills more than 400,000 persons a year in the United States. Every office visit is an opportunity to promote smoking cessation.

This Clinician's Guide is based on the *Clinical Practice Guideline on Smoking Cessation*. It was prepared by a panel of experts convened by the Agency for Health Care Policy and Research (AHCPR), and reflects a thorough review of evidence from clinical studies spanning 1978 to 1994. Additional support came from the Centers for Disease Control and Prevention.

Smoking Cessation

1. Every person who smokes should be offered smoking cessation treatment at every office visit.
2. Clinicians should ask about and record the tobacco-use status of every patient.
3. Cessation treatment even as brief as 3 minutes a visit is effective.
4. The more intense the treatment, the more effective it is in producing long-term abstinence from tobacco.
5. Nicotine replacement therapy (nicotine patches or gum), social support, and skills training are effective components of smoking cessation treatment.
6. Health care systems should be modified to routinely identify and intervene with all tobacco users at every visit.

Ask, Advise, Assist

Ask about smoking.

Implement an officewide system that ensures that tobacco-use status is obtained and recorded for every patient at every office visit.

Include tobacco use in vital signs data collected. Or place tobacco-use status stickers on all patient charts or indicate smoking status using computer reminder systems.

Advise tobacco users to quit.

In a clear, strong, and personalized manner, urge every smoker to quit.

- **Be clear.** ("I think it is important for you to quit smoking now, and I will help you.")
- **Speak strongly.** ("As your clinician, I need you to know that quitting smoking is the most important thing you can do to protect your current and future health.")
- **Personalize your advice.** ("You've already had one heart attack.") Mention the impact of smoking on children or others in the household. ("You know your children need you.")

Assist the patient with a quit plan.

Advise the smoker to:

- Set a quit date, ideally within 2 weeks.
- Inform friends, family, and coworkers of plans to quit, and ask for support.

- Remove cigarettes from home, car, and workplace and avoid smoking in these places.
- Review previous quit attempts—what helped, what led to relapse.
- Anticipate challenges, particularly during the critical first few weeks, including nicotine withdrawal.

Give advice on successful quitting:

- Total abstinence is essential—not even a single puff.
- Drinking alcohol is strongly associated with relapse.
- Having other smokers in the household hinders successful quitting.

Encourage use of nicotine replacement therapy (for more information on prescribing, precautions, and side effects, see the *Clinical Practice Guideline*):

- Both the nicotine patch and nicotine gum are effective pharmacotherapies for smoking cessation.
- The nicotine patch may be easier to use than the gum in most clinical settings.

Make culturally and educationally appropriate materials on cessation techniques readily available in your office.

Intensive Programs

Offer intensive smoking cessation programs.

If your patient prefers intensive treatment or you think such a program is appropriate, refer him or her to an intensive smoking cessation program administered by a specialist. Always followup with the patient about quitting.

- Intensive programs are strongly correlated with cessation success.
- Information obtained in the assessment (e.g., comorbidity, stress level) is useful in counseling.
- Many different types of clinicians (e.g., nurses, dentists, psychologists) are effective in increasing quit rates.
- Intensive programs should offer 4-7 sessions, each at least 20-30 minutes in length, lasting at least 2 weeks.
- Counseling should offer problem solving and skills training as well as social support.
- Counseling should reinforce motivation to quit and relapse prevention. Individual and group counseling are both effective.
- Every smoker should be offered nicotine replacement therapy (patch or gum), except when medically contraindicated.

If a smoker doesn't want to quit, clinicians should ask questions at each visit that help the patient identify (1) reasons to quit and (2) barriers to quitting. Pledge to assist the patient when he or she is ready to quit.

Key Treatment Strategies

Three treatment strategies are particularly effective:

Nicotine replacement therapy—Should be encouraged for most patients. Although the patch and gum are both effective, the patch is associated with fewer compliance problems and requires less effort to train patients in its use.

- *Patch*: Plan on 8 weeks of therapy. Starting on the quit day, place a new patch, each morning, on a relatively hairless place between the neck and the waist. Consult the package insert for dosing suggestions and precautions.

- *Gum*: Use for up to 3 months. Patients often do not use enough gum to get maximum benefit. Use one piece every 1-2 hours. Chew and "park" gum (between cheek and gum) intermittently for about 30 minutes to allow nicotine absorption. Use 4 mg (vs. 2 mg) dose for highly dependent smokers.
- *Nasal Spray*: Recently approved by FDA. Consult package insert for dosing and precautions.

Clinician-provided social support—Should communicate caring and concern by being open to the patient's fears and difficulties.

Skills training/problem-solving techniques—Should review previous quit successes and failures, anticipate relapse risk situations, and stress total abstinence starting on the quit day.

Followup

Schedule followup contact, either in person or by telephone.

Timing:

- First followup contact within 2 weeks of the quit date, preferably during the first week.
- Second contact within the first month.
- Further followup contacts as needed.

Actions during followup visits:

- Congratulate success.
- If a lapse occurred, ask for recommitment to total abstinence.
- Remind the patient that a lapse can be used as a learning experience and review the circumstances that caused it. Suggest alternative behaviors.
- Identify problems encountered and anticipate challenges in the immediate future.

All treatment strategies apply to adolescents who smoke. Clinicians should be empathetic and nonjudgmental and should personalize the encounter to the adolescent's individual situation. Nicotine replacement therapy may be considered in adolescents addicted to nicotine.

Prevent Relapse

To prevent relapse, offer ex-smokers reinforcement.

- Congratulate, encourage, and stress importance of remaining abstinent.
- Review the benefits, including potential health benefits, to be derived from cessation.
- Review the patient's success in quitting.
- Inquire about problems encountered in maintaining abstinence and offer possible solutions.
- Anticipate problems or threats to maintaining abstinence.

Discuss specific problems, such as:

- Weight gain.
- Negative mood/depression.
- Prolonged nicotine withdrawal.
- Lack of support for cessation.

Fear of weight gain is an impediment to smoking cessation. Inform smokers that many people gain weight when they stop smoking. Tell them that weight gain is a minor risk compared with the risks of

continued smoking. Tell patients to tackle one problem at a time. First, be confident that they have quit smoking for good, then work on reducing weight gain. Nicotine gum may delay weight gain.

For printed copies of this guide, the complete *Clinical Practice Guideline*, a *Quick Reference Guide for Smoking Cessation Specialists*, a *Consumer Version* (available in English and Spanish), or a list of other AHCPR guidelines, call toll free 800-358-9295 or write:

AHCPR Publications Clearinghouse
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These and other guidelines are available through the Internet (<http://www.ahcpr.gov/clinic/>). Copies of this and other brochures are free through InstantFAX, which operates all day every day. Using a fax machine equipped with a touchtone telephone, dial (301) 594-2800, push 1, and then press the start button for instructions and a list of publications.

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TO: Devora

FAX NUMBER: 456-5557

FROM: David Nelson
(202) 224-7675 phone
(202) 224-3533 fax

NUMBER OF PAGES: 4 (including cover)

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SPECS FOR SELECTED ASPECTS OF MEDICARE REFORM LEGISLATION

I. Establish HCFA Mission statement

It is the mission of the Health Care Financing Administration to:

- (1) Effectively and efficiently administer a program of health insurance coverage for elderly and disabled Medicare beneficiaries in accordance with the requirements of this title;
- (2) Assure that health care provided to the elderly and disabled under this title is of the highest quality;
- (3) In cooperation with other government agencies and the private sector, carry out programs to promote health, prevent disease, and assure the highest possible functional level for Medicare beneficiaries.

II. More effective delivery of services to beneficiaries with serious and chronic illnesses.

1. The Secretary shall conduct demonstrations to provide higher quality and more cost-effective services to individuals with serious and chronic illnesses.

A. Such demonstrations shall include:

- (1) Programs of case management;
- (2) Programs of disease management;
- (3) Programs to prevent avoidable hospitalizations of nursing home patients;
- (4) Such other programs as the Secretary determines offer the possibility of increasing quality of care and reducing costs.

B. In carrying out such demonstrations, the Secretary may waive such requirements of this title as are necessary to carry out such demonstrations effectively and efficiently and may utilize such techniques as:

(1) Contracts with centers of excellence or other entities or individuals with special expertise in providing quality services ;

(2) Innovative payment techniques, including capitation for all or selected services provided under the demonstration and incentive payments for favorable cost and quality outcomes;

(3) Provision of services not normally covered under this Title, if provision of such services will result in more cost-effective provision of covered services or higher quality care to

individuals;

- (4) Reduced cost-sharing for beneficiaries participating in such demonstrations.

The Secretary may not require any beneficiary or provider to participate in such demonstrations.

2. Implementation of effective demonstrations

The Secretary may implement programs to expand successful demonstrations conducted under the authority of (1) on a broader or nationwide basis without prior approval by the Congress if:

- o Such implementation will not abridge freedom of choice of provider, except to the degree the beneficiaries voluntarily choose to join a program limiting choice of provider for some or all services. In such case, the Secretary shall implement rules similar to the Medicare plus choice program.

- o Such implementation will not prevent providers not participating in the program from continuing to receive payment on the same basis provided in law and regulation.

- o The Congress is notified of the Secretary's intent to proceed with such implementation at least six months prior to the commencement of the program.

III. Empowering beneficiaries to more effectively protect and improve their own health

1. The Secretary shall inform beneficiaries of appropriate preventive health services and the benefits of such services, and shall encourage the utilization such services, including services not covered by the Medicare program. To the extent appropriate, information may be targetted on subpopulations of beneficiaries.

2. The Secretary, in cooperation with other agencies of government, the States, and the private sector shall inform Medicare beneficiaries of steps they can take to promote and safeguard their own health, including exercise, diet, accident prevention and such other activities as the Secretary deems appropriate.

3. The Secretary shall enter into grants and contracts with community organizations working with the elderly, organizations representing the elderly, and other appropriate recipients to assist in carrying out the functions described in (1) and (2).

4. The Secretary, in cooperation with the AHCPR, the NIH, academic health centers, professional bodies, and other sources of expertise shall identify areas where treatment of elderly and disabled frequently falls short of the the highest professional standards and shall the inform the Medicare beneficiaries of best practices in these areas.

4. The Secretary shall implement a program to provide information to Medicare beneficiaries to reduce the incidence of hospitalization and physician use among Medicare beneficiaries resulting from improper use of prescription and over-the-counter drugs

IV. Improving quality of care for the elderly and disabled.

1. The Secretary shall promote improvement in care in the areas identified in III-3. In carrying out this responsibility, the Secretary may conduct demonstrations and enter into grants and contracts with academic health centers, professional medical societies, and other appropriate organizations. The Secretary's activities shall include a program to reduce hospitalization and physician services arising from improper use of prescription drugs.

V. White House Conference on Improving the Health of the Elderly

There shall be a White House Conference on improving the health of the elderly. The Conference shall be broadly inclusive of the elderly, those who care for the elderly, researchers and research institutions with an expertise in elderly issues, and other appropriate parties. The goal of the conference shall be to develop a consensus on a program to empower the elderly to protect and improve their own health; to assure that the elderly are provided the highest standard of care, with emphasis on assuring that standard practice is also best practice; to more effectively meet the needs of the elderly through the Medicare program, and to outline a research and demonstration agenda to further these objectives.



Administration on Aging

Honor the Past, Imagine the Future: Towards a Society for All Ages

Older Americans Month, May 1999

Department of Health and Human Services Office of the Assistant Secretary for Aging

Date: 4-29

To: Devoral

Phone: _____

Fax: _____

FROM: _____

Phone: (202) 401-4634 or (202) 401-4541

Fax: (202) 401-7741

 Jeanette C. Takamura
Assistant Secretary for Aging

 Diane Justice
Deputy Assistant Secretary for Aging

✓ Moya Benoit Thompson
 Dave Bunoski
 Emily Kelly
 Nadine Langon
 Ana Carricchi Lopez

 Sunday Mezurashi
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 Evelyn Yee

Comments: Some health promotion examples
(1998)

I'm looking for more

Number of Pages (including cover sheet):

**State Units on Aging Examples
Of What They Are Doing in Health Promotion and Disease Prevention**

- ***New Jersey State Unit on Aging (NJ SUA) -Health Promotion and Disease Prevention Efforts***
 - **Immunization**
 - In collaboration with the Peer Review Organization of NJ and its Partnership for Prevention, the program participates annually in campaigns to increase the immunization rates of Medicare beneficiaries for influenza and pneumococcal pneumonia.
 - The Department has conducted a direct mailing to all health care facilities encouraging them to immunize their elderly clients.
 - In conjunction with the PRO and Xact Medicare Services, training workshops are conducted to train personnel in local health departments, hospitals, and long term care facilities on the correct billing procedures for Medicare reimbursements for these immunizations.
 - A week-long kick off campaign will be conducted this fall in Atlantic city where immunizations will be provided in the casinos.
 - **Project Healthy Bones**
 - Wellness and safe exercise program for older women at risk for osteoporosis and osteoporosis-related disability.
 - Peer leaders are trained to lead older women in group exercise, including strength training with weights and expanded balance exercised.
 - Educates women on the importance of exercise, nutrition and other lifestyle factors related to osteoporosis.
 - Operating in all of New Jersey's 21 counties. Need to expand program to meet demand for participants.
 - **Circle of Friends (Women Telling Women About Health Issues)**
 - A membership program designed (1) to inform mature Black women about breast cancer and cervical cancer and other health

issues; and (2) to link women to cancer screening opportunities.

- Encourages older women to take charge of their health by becoming informed about self-care and empowered to practice healthy behaviors.
- Developed and funded by the National Caucus and Center on Black Aged, Inc.
- Implemented jointly by the NJ State Division of Senior Affairs and the NJ State Division of Family Health
- Currently operating in two counties. Hopes to expand statewide.

- Health Promotion Initiative

- A cooperative effort between the NJ Division of Senior Affairs and the University of Medicine and Dentistry's Geriatric Education Center.
- Multidisciplinary coalitions are formed at the county level. Coalitions are co-led by the Office on Aging and local health department.
- Goal is to provide professional education/training on an identified topic. Subsequent to training, local coalitions will implement initiatives to foster health promotion in the identified area.
- Currently in development in three counties. Plan to expand to 12 counties over the next two years.

- *Connecticut State Unit on Aging* (CT SUA) did outreach to the Hispanic community around breast cancer using the buddy system. Women of the same age group got together to talk about the disease and they brought in a professional women around the same age to provide health information. CT SUA sent flyers to churches for them to put notice out on the buddy system in the church bulletin. Older people used the buddy system for going to screenings and for treatment too. SUA also worked with the cosmetology association about putting flyers in beauty parlors. The beauticians talked to their clients about the importance of mammography and breast cancer prevention. This approach seems to work well in rural as well as minority communities.

- **Tennessee State Unit on Aging (TN SUA) Health Promotion and Disease Prevention Efforts:**
 - The TN SUA three -year plan, FY 98-FY00, focuses on four of the Healthy People 2000 health goals. TN SUA wanted to raise awareness about selected health conditions and to assist the senior centers in developing their health promotion programs. The health conditions are: flu; breast cancer; diabetes; and osteoporosis, including safety from falls and injury. Later, stroke was added to the list.
 - The Tennessee Commission on Aging (TCA) has a Resource Library. Health promotion programming is a large part of the holdings. Materials are available free to the aging network.
 - TN SUA developed resource memo to senior center directors that focuses on information and resources for health promotion programming and that highlights materials available from the Resource Library. Memo went to about 400 persons in the aging network.
 - TN SUA worked with nutrition providers at Mid-Cumberland and Greater Nashville and the nutrition person on a video nutrition training module. Module will be used at TN SUA fall training (1998) at a session on innovative nutrition modules.
 - TN SUA worked on a Flu and Pneumonia Immunization Initiative. TCA is a member of the Tennessee Immunization Team. The TN SUA worked with team and area agencies on aging to develop a flu campaign in senior centers and at nutrition sites. Shots were also given at the senior centers. The Flu Shot Reminder Card sent to persons at centers, nutrition sites, and sent with home delivered meals. TN SUA is currently in its 2nd year of the initiative.
 - TN SUA worked with the "Horizons Project" Committee at Meharry Medical School on the initiative to increase the rate of flu immunizations among African Americans in 4 metropolitan areas and on plans for Tennessee Flu Awareness Day, in October in Nashville with this group. TN SUA is currently in its 2nd year of this effort. The statistics are up 6% for state immunizations and TN SUA likes to think that they had something to do with that.
 - TN SUA developed a Flu Campaign Kit for senior center directors, nutrition program directors and area agencies on aging. It includes education materials about influenza and pneumonia, sample public

relations materials with each senior centers' name, poster, and T-shirt order forms.

- TN SUA developed Breast Cancer Awareness Campaign Kit for the senior center directors, nutrition program directors, and area agencies on aging for breast cancer awareness month in October. Kit includes educational material, resources available from the TCA Resources Library and programming ideas.
- TN SUA developed Diabetes Awareness Kit for senior centers and nutrition directors for Diabetes Awareness month in November. Kit includes brochures and educational materials, a paper and pencil screening, resources available from TCA Resources Library, and a sample new release.
- TN SUA created an American Diabetes Alert Day. They developed alert packet for senior center directors and area agencies on aging. Alert kit contained a newspaper promotion article and materials provided by the American Diabetes Association including risk assessment test, stickers and poster.
- TN SUA worked closely with the Osteoporosis Prevention coalition at Tennessee Department of Health. The Health Educator has a display at conferences that the TN SUA is involved in. This year (1998) the Health Educator will focus on educational programs in senior centers throughout the state.
- TN SUA worked with a pilot program for senior centers funded by a Stroke Belt Consortium aimed at African American older persons on stroke health promotion. There is a TV-show-style cooking demonstration and a tasting of healthy foods and education about the signs of stroke and what to do. Participants get the ingredients for one of the recipes. The TV personality/cook and demonstration food courtesy of Kroger Company. A health screening is done by a local health provider at the time.
- TN SUA is also planning a training for senior centers on a health promotion unit for new hires with the excellent assistance of the statewide advisory committee.
- TCA is an active member of the following statewide health promotion coalitions:

- (1) Tennessee Adult Immunization Team - Mid-South Foundation for Medical Care (HCFA peer review organization), Meharry Medical College Horizons Program, Tennessee Department of Health, Medicare (Part B) intermediary, and Medicare carrier (Part A).
 - (2) Diabetes Coalition: Tennessee Department of Health Minority Programs, American Diabetes Association, and others including physicians, medical educators, insurers, etc.
 - (3) Tennessee Osteoporosis Coalition: Tennessee Department of Health, State Representative Mary Pruitt, Department of Health Minority Program, and others.
 - (4) Medicare Beneficiary Committee which is composed of agencies with older consumers, older volunteer organizations, and Medicare Part A and Part B. Medicare people arrange educational programs on Medicare changes for TN SUA providers.
- *Delaware State Unit on Aging (DE SUA) - Health Promotion and Disease Prevention Efforts*
 - Cancer Awareness - Prostate Cancer and Breast Cancer Awareness
 - Over the past 5 years DE SUA has done a variety of promotional activities to raise awareness and educate seniors about prostate cancer and breast cancer and the importance of early detection. Many of our activities have been accomplished through partnerships with the American Cancer Society as well as other private and public organizations addressing cancer. Promotional activities has included billboard campaigns, PSAs, special events hosted by state officials, educational seminars, educational materials, etc.
 - Older Women's Health Campaign (OWHC)
 - A new initiative in 1998 was to address the health concerns of older women in the *Delaware Older Women Staying Healthy Campaign*. This effort is possible through a partnership between the Department of Health and Social Services' Division of Services for Aging and Adults with Physical Disabilities and the Division of Public Health. Taking after the National Governor's Spouses Association campaign to address womens health issues, Delaware

analyzed the issues important to Delaware's older women. The purpose of the campaign is to educate and heighten awareness of older women about potential health risks and how to reduce those risks. The major objectives are to promote healthy living choices and to provide intervention resources, thus increasing early detection and treatment of four major diseases to which older women are particularly vulnerable: depression, breast cancer, cardiovascular disease, and osteoporosis. A programming kit has been developed along with an educational brochure. Over 50 organizations have received the programming kit which will assist them in taking the messages of the Campaign to their community of older women.

- Osteoporosis Initiative

- This past January (1998), legislation was passed to establish an Osteoporosis Prevention and Education initiative under the Department of Health and Social Services. Since osteoporosis was already part of the newly developed *Delaware Older Women Staying Healthy Campaign*, it was decided that the current campaign would expand its focus and give additional efforts towards osteoporosis. This project is still in the planning stages and hopes to kick off this fall.

- Healthwise Programs

- The *Healthwise for Life Program* and the *Health and Wisdom Program* are two programs DE SUA purchased five years ago from Healthwise, Inc. The *Healthwise for Life Program* educates seniors about being a good medical consumer, about good doctor/patient relationships and provides a wealth of health information through the *Healthwise For Life Handbook*. The *Health and Wisdom Program* educates seniors about the key components to mental wellness and provides tips for maintaining it. It talks about the myths of aging and discusses some common concerns of seniors: such as memory loss, depression and grief and loss. This program also provides a guidebook for the participants. The DE SUA purchased several training guides and provided train-the-trainer programs for various health professionals serving seniors. Five years later, the two programs are still being given throughout the community and have reached over 2500 seniors statewide. The programs have been given in over 50 different sites and continues to be enjoyed by participants. The two participant program books

provided by the DE SUA are key pieces of the programs and are very popular.

- **Gambling Addiction Program**
 - This year (1998), the DE SUA was provided funding by the Division of Drug, Alcoholism and Mental Health (from the State's video lottery) to develop and implement an educational/awareness program for seniors on responsible gambling. Statistics show an increase in the number of seniors with gambling problems. The program being developed will educate seniors about the warning signs of problem gambling, provide a simple self test to help them determine if they or someone they know has a problem, provide information on where to go for help, and provide tips for financial planning. In addition, the program will educate caregivers and business professionals who interact with seniors, about the warning signs. The program is still in the planning stages.
- **Diabetes Awareness**
 - In 1998, DE SUA are planning to develop a Diabetes educational/awareness program for seniors. As insurance coverage changes for diabetes, it is important for seniors to be made aware of these changes through diabetes education and materials. In addition, an increase in education is needed for both physicians and patients about the standards of care for a diabetic patient. The DE SUA plans to work with Delaware's Diabetes Coalition and those working with seniors to develop a program to address these issues.
- **Depression Support Groups**
 - A new program called, Life Times, is being designed to address the issue of depression among seniors. The goal of the program is to provide support to those individuals who may be experiencing some depression due to secondary causes such as grief, isolation, transitions in life, etc. Social support groups provide social support, socialization and camaraderie. The program trains senior volunteers to be group facilitators. Volunteers will be trained on listening skills, group process, validation, as well as, resources in the community, and warning signs that a person may need further help beyond the group. The groups will be held in senior centers, churches, or retirement residential facilities. The groups will be

promoted throughout the community and will keep an "open door" policy, always welcoming new participants. The program will pilot five sites in the northern part of the state and five in the central and southern parts of the state.

- Delaware State Fair - Senior Health Fair

- The DE SUA has just completed its 7th year hosting a Senior Health Fair at the Delaware State Fair. This event is held on the Fair's Senior Citizen Day and draws several hundred people. The Health Fair usually hosts 20 to 25 exhibitors who provide information on health issues common to older adults, health services offered in the community and provide onsite health screenings. Exhibitors come from all over the state to participate.

- Community Outreach

- The DE SUA participates in approximately 20 community health fairs throughout the year. This gives the DE SUA a good opportunity to raise awareness of agency services as well as provide health education information to seniors.

- Caregiving Program

- In 1996, a survey on caregiving issues was conducted of home care providers and health professionals who come in contact with caregivers of seniors. Findings showed a need for more respite care. However, one of the barriers to assisting the caregiver was lack of trust of outsiders coming into the home as well as financial constraints. The Volunteer Companion Respite Care program was developed to address these issues. The purpose of the program was to match trained volunteers with a family in need of some respite care, yet could not afford it. Volunteers would receive training and would be matched with a family. It was the DE SUA hope by providing a caring volunteer, who would be the family's sole respite care provider, the family and person being cared for would be able to develop trust in the volunteer companion. The match between family and volunteer was crucial for the success of the program. The southern portion of the state had great success with volunteers and families in need. Many matches were made and proved rewarding for both parties. The northern part of the state had more difficulty with recruiting volunteers and therefore fewer families were served. However, those matches that were

made, were successful.

- *California State Unit on Aging (CA SUA)* Health Promotion and Disease Prevention Efforts
 - Promoting Physical Activity and Health for Seniors
 - Promoting the 1996 Surgeon General's Report on Physical Activity and Health
 - Promoting Strength Training in Seniors Leading to Increased Independence for Them

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LEVEL 1 - 3 OF 4 STORIES

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BYLINE: **Appling**, Susan E.

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Our society is aging. At the turn of the 20th century only 4% of the population lived past 65., by the end of the century the percentage will be 13% and by 2030 will increase to 22%. Moreover, the fastest growing segment of the population are those over 85 years old (U.S. Department of Health and Human Services, 1991). As a result, more and more nurses find themselves caring for an ever-older population. Whether working with the elderly in acute, longterm, or home care or with the well elderly in community and retirement settings, we can make a difference in their well-being. By emphasizing fundamental steps each person can take to maintain and improve health, we can give them greater power and control over their lives.

Physical Activity

Perhaps the most important point to emphasize to any aging person, and particularly to post-menopausal women, is the need to maintain mobility. The Centers for Disease Control and Prevention (CDCP, 1993) estimates that, in the sedentary (approximately 58% of the population), a significant decrease in coronary heart disease could be achieved by increasing physical activity. Similarly, rates of hypertension, obesity, diabetes, osteoporosis, and even depression and anxiety can be diminished through improved physical activity.

Recent guidelines developed by the American College of Sports Medicine and the CDCP are easily adopted by the elderly as they do not require set periods of vigorous exercise, an unachievable goal for many. Specifically, they recommended that "every adult should accumulate 30 minutes or more of moderate-intensity physical activity on most, preferably all, days of the week" (Pate et al., 1995). Individuals can then be counseled to evaluate their daily activities and develop a plan that will include a total of 30 minutes of moderate activity such as walking and gardening. These and other weight-bearing activities decrease the rate of bone demineralization and development of osteoporosis. The addition of resistance training using weights such as ankle and wrist weights not only maximizes the bone strengthening effects of walking but also promotes muscle strength and thus, improves balance. Indeed, recent studies have shown that the



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elderly, without medical contraindications, can exhibit a 30% to 97% improvement in muscle strength. This significant increase was achieved after only 8 weeks of weight training 3 to 4 times per week (Pyka, Lindenberg, Charette, & Marcus, 1994). For those patients with physical limitations, such as osteoarthritis, who find walking painful, water exercise can still promote joint function and muscle strength, while minimizing pain. In general, the elderly should be instructed to avoid isometric exercises due to the untoward effects on blood pressure and myocardial oxygen consumption.

Diet

Nutritional intake also requires special attention. Although nearly every American has heard the national mandate to decrease fat (particularly saturated fat) to 30% of caloric intake and increase dietary fiber by eating more grains, vegetables, and fruits, few clearly understand the scientific rationale supporting these recommendations. Simple explanations of several of the following findings can help clarify the reasons for the growing consensus regarding dietary recommendations.

The U.S. Preventive Services Task Force (1996) has clearly summarized the many statistics and studies relating diet to health and several are worth discussing with patients. Heart disease, cancer, stroke, diabetes, hypertension, and obesity are the diseases in which diet has a clear role. Given that heart disease, cancer, and stroke constitute three of the four leading causes of death, a healthy diet can have a significant positive impact. Intake of saturated fats correlates closely with serum cholesterol levels, a major link in the development of coronary heart disease. Additionally, international comparisons of cancer rates have demonstrated a close relationship between dietary fat consumption and incidence of cancer (colon, breast, prostate, and lung). Similar cross cultural studies noted that increased fiber intake is associated with decreased rates of colon cancer. Decreased levels of low-density lipoproteins and prevention of diverticular disease are also associated with increased fiber intake. Finally, nearly 40% of older adults have an inadequate dietary intake of three or more nutrients. A multivitamin in addition to a healthy diet can assure that all key nutrients are supplied, particularly those with antioxidant effects such as vitamins A, E, and C (Monte, 1994). Working with the elderly to adopt healthy, realistic diets despite physical, economic, and social limitations is a major challenge but can result in significant improvements in health.

Often overlooked in diet counseling is fluid intake. Many elderly drink less than the needed 2,000 to 3,000 cc for reasons including, mobility limitations, and incontinence. Discussing the role of fluids in promoting adequate circulatory, renal, and bowel function and developing strategies that integrate adequate fluid, nutrient, and fiber intake can also improve overall functioning.

Sleep

Many elderly suffer from insomnia, characterized by difficulty falling asleep or remaining asleep. These disturbed sleep patterns may leave the person chronically tired and frustrated that a "good night's sleep" can not be achieved. When not caused by physical or emotional conditions requiring medical attention, there are a variety of strategies nurses can help their patients



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employ to diminish sleep disturbances. The National Institute on Aging (1992) suggests: (a) regular sleep schedule and bedtime routine; (b) regular exercise (although not within 2 hours of bedtime); (c) use the bedroom for sleeping only; (d) if sleep does not come within 15 minutes, get out of bed and go to another room until sleepy again; (e) avoid alcohol and caffeine, (f) a snack before bed such as a glass of warm milk may also help.

Preventive Services

And finally, everyone 65 or older should receive the routine clinical preventive services recommended by the U.S. Preventive Services Task Force (1996). Routine screening of height, weight, blood pressure, vision, hearing, and for problem drinking as well as yearly assessment of fecal occult blood and/or sigmoidoscopy should be done. Additionally, women should receive a clinical breast exam and mammogram every 1 to 2 years at least until age 70. Continued screening is reasonable based on the substantial burden of suffering due to breast cancer in elderly women and other key factors including patient preference and past medical history. PAP smears for women who are or have been sexually active should continue every 1 to 3 years but can be stopped after 65 if previous regular screenings have been within normal limits. Yearly influenza immunization is recommended and anyone over 65 should receive the pneumococcal vaccine.

Although clearly not an exhaustive review of prevention strategies, these represent many of the fundamental and important interventions and counseling topics that have the greatest potential for maintaining and improving health. Giving older adults information they can easily use to gain control over their own well-being, can have a significant effect on their long-term quality of life.

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LANGUAGE: ENGLISH

IAC-CREATE-DATE: March 13, 1997

LOAD-DATE: March 14, 1997



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OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

of pages ► 8

To: <u>Debra Adler</u>	From: <u>Maria Ramirez</u>
Dept./Agency	Phone # <u>(404) 786-1122</u>
Fax # <u>(202) 456-5557</u>	Fax #

NSN 7540-01-317-7368

5098-101

GENERAL SERVICES ADMINISTRATION

THIS IS NOT A BILL

Explanation of Your Medicare Part B Benefits

**JOHN D DOE
APARTMENT 12 C
63 WOODLAWN DRIVE
BALTIMORE, MARYLAND 21207-1111**

Summary of this notice dated February 1, 1994

Total Charges:	\$ 300.00
Total Medicare approved:	\$ 180.00
 We are paying you:	 \$ 144.00
Your total responsibility:	\$ 207.00

Your Medicare number is: 123-45-6789A

Your provider did not accept assignment

Details about this notice (See the back for more information)

Control number 0000-0000-0000

BILL SUBMITTED BY: Elm Street Clinic
Mailing Address: 123 Elm Street, Baltimore, MD 21228

Dates	Services and Service Codes	Charges	Medicare Approved	See Notes Below
Jan 10, 1994	Dr. Mary Smith 3 office visits [00000]	\$ 300.00	\$ 180.00	a, b

our provider did not accept assignment. We are paying you the amount that we owe you. See #4 on the back of this notice.

Notes:

- a The approved amount is based on the fee schedule
- b Your doctor did not accept assignment for this service. Under federal law, your doctor cannot charge more than \$207.00.

Here's an explanation of this notice:

Of the total charges, Medicare approved	\$180.00	See #4 on the back. Your co-payment is 20%
Your 20%	<u>- 36.00</u>	
The % Medicare pays	\$144.00	
We are paying you	\$144.00	
Of the total charges	\$300.00	You are not responsible for this amount which is in excess of the Medicare limiting charge. See note b.
Less amount exceeding charge limit	<u>- 93.00</u>	
The total you are responsible for	\$207.00	The provider may bill you for this amount.

IMPORTANT: If you have questions about this notice, call (carrier name) at (carrier telephone number) or see us at (carrier walk-in address). You will need this notice if you contact us.

To appeal our decision, you must WRITE to us before August 1, 1994. See #2 on the back.

Important Information You Should Know About Your Medicare Part B Benefits

Part of the notice answers some questions about receiving Medicare payments. If you have questions, see your copy of *The Medicare Handbook* or call us for more information.

1. What should I do if I have questions about this notice?

If you have questions about this notice, call, write, or visit us and we will tell you the facts that we used to decide what and how much to pay. Turn to the front of this notice; our address and phone number are on the bottom of the page.

2. Can I appeal how much Medicare paid for these services?

If you do not agree with what Medicare approved for these services, you may appeal our decision. To make sure that we are fair to you, we will not allow the same people who originally processed these services to conduct this review.

However, in order to be eligible for a review, you must write to us within 6 months of the date of this notice, unless you have a good reason for being late (for example, if you had an extended illness which kept you from being able to file on time).

Turn to the front of this notice; the deadline date and our address are on the bottom of the page. It may help your case if you include a note from your doctor or supplier (provider) that tells us what was done and why.

If you want help with your appeal, you can have a friend, lawyer or someone else help you. Some lawyers do not charge unless you win your appeal. There are groups, such as lawyer referral services, that can help you find a lawyer. There are also groups, such as legal aid services, who will give you free legal services if you qualify.

3. How much does Medicare pay?

The details on the front of this notice explain how much Medicare paid for these services. See your copy of *The Medicare Handbook* for more information about the benefits you are entitled to as a beneficiary in the Medicare Part B program. If you need another copy of the handbook, call or visit your local Social Security office.

Medicare may make adjustments to your payment. We may reduce the amount we pay for services by a certain percentage (Balanced Budget Law). If your provider accepted assignment, you are not liable to pay the amount of this reduction. We pay interest on some claims not paid within the required time.

All Medicare payments are made on the condition that you will pay Medicare back if benefits are also paid under insurance that is primary to Medicare. Examples of other insurance are employer group health plans, automobile medical liability, no fault or workers' compensation. Notify us immediately if you have filed or could file a claim with insurance that is primary to Medicare.

4. How can I reduce my medical costs?

Many providers have agreed to be part of Medicare's participation program. That means that they will always accept the amount that Medicare approves as their full payment. Write or call us for the name of a participating provider or for a free list of participating providers.

A provider who accepts assignment for covered services can charge you only for the part of the annual deductible you have not met and the copayment which is 20 percent of the approved amount.

If you are treated by one of these doctors, you can save money. See *The Medicare Handbook* for more information about how you can reduce your medical costs.

Generally a doctor who has not accepted assignment may not charge more than 120 percent of the Medicare approved amount for services provided in 1992, or more than 115 percent for services provided in 1993 or later. This is known as the **limiting charge**. Contact us if assignment was not accepted, and you think your doctor charged more than the limiting charge.

5. How can I use this notice?

You can use this notice to:

- o Contact us immediately if you think Medicare paid for a service you did not receive;
- o Show your provider how much of your deductible you have met;
- o Claim benefits with another insurance company. If you send this notice to them, make a copy of it for your records.



Medicare Summary Notice

June 15, 1998

BENEFICIARY NAME
STREET ADDRESS
STREET ADDRESS
STREET ADDRESS
CITY, STATE ZIP CODE

CUSTOMER SERVICE INFORMATION

Your Medicare Number: 111-11-1111A

If you have questions, write or call:

Medicare
555 Medicare Blvd.
Suite 200
Medicare Building
Medicare, US XXXXX-XXXX

Local: (XXX) XXX-XXXX

Toll-free: 1-800-XXX-XXXX

TTY for Hearing Impaired: 1-800-XXX-XXXX

HELP STOP FRAUD: Beware of telemarketers offering free or discounted Medicare items or services.

This is a summary of claims processed from 05/15/1998 through 06/15/1998.

PART B MEDICAL INSURANCE - ASSIGNED CLAIMS

Dates of Service	Services Provided	Amount Charged	Medicare Approved	Medicare Paid Provider	You May Be Billed	See Notes Section
Claim Number 0000-0000-0000						
Chipper Bird, M.D., 123 North Avenue, Reno, NV 11128-0178						
Referred by: Mark Tall, M.D.						
02/10/98	1 Influenza immunization (90724)	\$5.00	\$3.88	\$3.88	\$0.00	a
02/10/98	1 Admin, flu vac (G0008)	5.00	3.43	3.43	0.00	a
	Claim Total	\$10.00	\$7.31	\$7.31	\$0.00	
Claim Number 0000-0000-0000						
Chipper Bird, M.D., 123 North Avenue, Reno, NV 11128-0178						
03/29/98	1 Subsequent Hospital Care (99232)	\$75.00	\$0.00	\$0.00	\$0.00	b
03/31/98	1 Subsequent Hospital Care (99232)	75.00	0.00	0.00	0.00	b
	Claim Total	\$150.00	\$0.00	\$0.00	\$0.00	

PART B MEDICAL INSURANCE - UNASSIGNED CLAIMS

Dates of Service	Services Provided	Amount Charged	Medicare Approved	Medicare Paid You	You May Be Billed	See Notes Section
Claim Number 0000-0000-0000						
Chad Smith, M.D., 1414 Bravers Blvd., Atlanta, GA 62789-0181						
Referred by: Barney Rubble, M.D.						
03/30/98	1 Office/Outpatient Visit, Est. (99213)	\$34.00	\$29.76	\$23.81	\$34.00	c
03/30/98	1 X-ray Exam of Lower Spine (72100)	35.00	0.00	0.00	35.00	
	Claim Total	\$69.00	\$29.76	\$23.81	\$69.00	

THIS IS NOT A BILL - Keep this notice for your records.

OIG2.pms

Y r Medicare Number: 111-11-1111A

Page 2 of 4
June 15, 1998**PART B MEDICAL INSURANCE - UNASSIGNED CLAIMS (continued)**

Dates of Service	Services Provided	Amount Charged	Medicare Approved	Medicare Paid You	You May Be Billed	See Notes Section
Claim number 0000-0000-0000 Chad Smith, M.D., 1414 Bravers Blvd., Atlanta, GA 62789-0181 Referred by: Barney Rubble, M.D.						
04/13/98	1 Electrocardiogram, Complete (93000)	\$26.92	\$23.41	\$18.73	\$26.92	d
04/13/98	1 Cardiovascular Stress Test (93015)	112.33	97.68	78.14	112.33	
	Claim Total	\$139.25	\$121.09	\$96.87	\$139.25	
Claim number 0000-0000-0000 Sam Son, M.D., 643 George Ave., Lexington, KY 27292-7777 Referred by: Ker Lee, M.D.						
04/14/98	1 Office/Outpatient Visit, Est. (99213)	\$34.22	\$29.76	\$25.33	\$34.22	e
Claim number 0000-0000-0000 Ken U. Hear, M.D., 643 Drum Ave., Johnson City, TN 37659 Referred by: John Knee, M.D.						
04/15/98	8 Non ESRD Epopstin Alpha Inj (Q0136)	\$168.00	\$91.20	\$72.96	\$104.88	f

Notes Section:

- a This service is paid at 100% of the Medicare approved amount.
- b The cost of care before and after the surgery or procedure is included in the approved amount for that service.
- c Payment denied because the claim did not show if the test was purchased by the physician or if the physician performed the test.
- d The name or Medicare number was incorrect or missing. Ask your provider to use the name or number shown on this notice for future claims.
- e Your payment includes interest because Medicare exceeded processing time limits.
- f Your doctor did not accept assignment for this service. Under Federal law, your doctor cannot charge more than \$104.88. If you have already paid more than this amount, you are entitled to a refund from the provider.

Deductible Information:

You have met the Part B deductible for 1998.

Your Medicare Number: 111-11-1111A

Page 3 of 4
June 15, 1998

General Information:

Good News! There will be a Medicare workshop in Anywhere, USA on August 20, 1999. Contact the Medicare contractor whose number is listed on the front page of this notice for more information.

Our telephone device for the deaf (TDD/TTY) is now available. PLEASE USE ONLY IF YOU HAVE THIS DEVICE. The number to call to use this device is 1-800-XXX-XXXX.

Get a mammogram - A picture that can save your life. Your physician or Medicare contractor can provide information on this Medicare covered service.

You have the right to request an itemized statement which details each Medicare item or service which you have received from your physician, hospital, or any other health supplier or health professional. Please contact them directly if you would like an itemized statement.

Medicare covers vaccinations to prevent pneumococcal pneumonia. If you never had a pneumococcal pneumonia shot, protect yourself and get one now. If your provider accepts what Medicare pays, there shouldn't be a charge to you.

If you change your address, please contact (contractor name) by calling (contractor phone) and the Social Security Administration by calling 1-800-772-1213.

Report Medicare fraud by calling the Medicare Fraud Hotline at 1-800-447-8477.

Appeals Information - Part B

If you disagree with any claims decision on this notice, you can request an appeal by December 15, 1998. Follow the instructions below:

- 1) Circle the item(s) you disagree with and explain why you disagree.
- 2) Send this notice, or a copy, to the address in the "Customer Service Information" box on Page 1.
- 3) Sign here _____ Phone number () _____



Medicare Summary Notice

Page 1 of 2

June 10, 1995

BENEFICIARY NAME
STREET ADDRESS
CITY, STATE ZIP CODE

CUSTOMER SERVICE INFORMATION

Your Medicare Number: 111-11-1111A

If you have questions, write or call:

Medicare
555 Medicare Blvd.
Suite 200
Medicare Building
Medicare, US XXXXX-XXXX

Local: (XXX) XXX-XXXX

Toll-free: 1-800-XXX-XXXX

TTY for Hearing Impaired: 1-800-XXX-XXXX

HELP STOP FRAUD: Beware of "free" medical services or products. If it sounds too good to be true, it probably is.

This is a summary of claims processed from 5/15/95 through 6/10/95.

PART A HOSPITAL INSURANCE - INPATIENT CLAIMS

Dates of Service	Benefit Days Used	Non-Covered Charges	Deductible and Coinsurance	You May Be Billed	See Notes Section
Claim number 12435-84956-84556-45621 Care Hospital, 123 Sick Lane, Dallas, TX 75555 Referred by: Paul Jones, M.D. 04/25/95-05/09/95	14 days	\$0.00	\$746.00	\$746.00	a. b
Claim number 12435-84956-84556-45622 Continued Care Hospital, 124 Sick Lane Dallas, TX 75555 Referred by: Paul Jones, M.D. 05/09/95-05/20/95	11 days	\$0.00	\$0.00	\$0.00	

PART B MEDICAL INSURANCE - OUTPATIENT FACILITY CLAIMS

Dates of Service	Services Provided	Amount Charged	Non-Covered Charges	Deductible and Coinsurance	You May Be Billed	See Notes Section
Claim number 1235-8956-8458 Medicare Hospital, 123 Medicare Lane, Dallas, TX 75209 Referred by: Paul Jones, M.D. 04/02/95	I.V. Therapy (Q0081)	\$33.00	\$0.00	\$6.60	\$6.60	
	Lab (88104)	1,140.50	0.00	228.10	228.10	
	Operating Room (31628)	786.50	0.00	157.30	157.30	
	Observation Room (99201)	293.00	0.00	58.60	58.60	
	Claim Total	\$2,253.00	\$0.00	\$450.60	\$450.60	

THIS IS NOT A BILL - Keep this notice for your records.

Your Medicare Number: 111-11-1111A

Page 2 of 2
June 10, 1995**PART B MEDICAL INSURANCE - OUTPATIENT FACILITY CLAIMS (continued)**

Dates of Service	Services Provided	Amount Charged	Non- Covered Charges	Deductible and Coinsurance	You May Be Billed	See Notes Section
Claim number 12435-84956-84556-45621 Medicare Hospital, 123 Medicare Lane, Dallas, TX 75209 Referred by: Paul Jones, M.D. 04/16/95 Radiology (71020)						
		\$39.00	\$0.00	\$7.80	\$7.80	
Claim number 12435-84956-84556-45621 Medicare Hospital, 123 Medicare Lane, Dallas, TX 75209 Referred by: Paul Jones, M.D. 05/25/95 X-Ray (71020)						
		\$101.85	\$0.00	\$20.37	\$20.37	

Notes Section:

- a \$716.00 was applied to your inpatient deductible.
- b \$30.00 was applied to your blood deductible.

Deductible Information:

You have met the Part A deductible for this benefit period.

You have met the Part B deductible for 1995.

You have met the blood deductible for 1995.

General Information:

If you were offered free items or services but Medicare was billed, please call your local Customer Service at (XXX) XXX-XXXX.

Appeals Information - Part A (Inpatient)**Appeals Information - Part B (Outpatient)**

If you disagree with any claims decision on PART A of this notice, you can request an appeal by August 10, 1995. Follow the instructions below:

If you disagree with any claims decision on PART B of this notice, you can request an appeal by December 10, 1995. Follow the instructions below:

- 1) Circle the item(s) you disagree with and explain why you disagree.
- 2) Send this notice, or a copy, to the address in the "Customer Service Information" box on Page 1.
- 3) Sign here _____ Phone number () _____

IMPORTANT INFORMATION YOU SHOULD KNOW ABOUT YOUR MEDICARE BENEFITS

For more information about services covered by Medicare, please see your Medicare Handbook.

PART A HOSPITAL INSURANCE (INPATIENT)

helps pay for inpatient hospital care, inpatient care in a skilled nursing facility following a hospital stay, home health care and hospice care. Inpatient services are measured in benefit periods. A benefit period begins the first time you receive Medicare covered inpatient hospital care and ends when you have been out of the hospital or skilled nursing facility for 60 consecutive days. There is no limit to the number of benefit periods you may have.

THE AMOUNT YOU MAY BE BILLED for Part A services includes:

- an inpatient hospital deductible once during each benefit period,
- a coinsurance amount for the 61st through the 90th days of a hospital stay during each benefit period,
- a coinsurance amount for each Lifetime Reserve Day, which can be used if you have to stay in the hospital more than 90 days in one benefit period. Lifetime Reserve Days may be used only once.
- a blood deductible for the first three pints of unreplaced blood furnished to you in a calendar year in some states,
- an inpatient coinsurance for the 21st through the 100th days of a Medicare covered stay in a skilled nursing facility,
- charges for services or supplies that are not covered by Medicare. You may not have to pay for certain denied services. If so, a NOTE on the front will tell you.

PART B MEDICAL INSURANCE (OUTPATIENT FACILITIES) helps pay for care provided by certified medical facilities, such as hospital outpatient departments, renal dialysis facilities, and community health centers.

THE AMOUNT YOU MAY BE BILLED for Part B services includes:

- an annual deductible, the first \$100 of Medicare Part B charges each year.
- a coinsurance amount, generally, 20% of the amount charged, after the deductible has been met for the year,
- charges for services or supplies that are not covered by Medicare. You may not have to pay for certain denied services. If so, a NOTE on the front will tell you.

If you have supplemental insurance, it may help to pay the amounts you may be billed. If you use this notice to claim supplemental benefits from another insurance company,

make a copy for your records.

WHEN OTHER INSURANCE PAYS FIRST: All

Medicare payments are made on the condition that you will pay Medicare back if benefits could be paid by insurance that is primary to Medicare. Types of insurance that should pay before Medicare include employer group health plans, no-fault insurance, automobile medical insurance, liability insurance and workers' compensation. Notify us right away if you have filed or could file a claim with insurance that is primary to Medicare.

YOUR RIGHT TO APPEAL: If you disagree with any decision on this notice, you have a right to appeal. For **PART A** decisions, you must file an appeal within **60 days** of receiving this notice. For **PART B** decisions, you must file your appeal within **6 months** of the date of this notice. Follow the appeal instructions for Part A or Part B on the front of the last page of the notice. If you want **help with your appeal**, you can have a friend or someone else help you. There are also groups, such as legal aid services, that will provide free advisory services if you qualify. To contact us for the names and telephone numbers of groups in your area, please see our Customer Service Information box on the front of this Summary Notice.

HELP STOP MEDICARE FRAUD: Fraud is a false representation by a person or business to get Medicare payments. Some examples of fraud include:

- offers of goods or money in exchange for your Medicare Number
- telephone or door to door offers of free medical services or items, and
- claims for Medicare services/items you did not receive.

If you think a person or business is involved in fraud, you should call Medicare at the Customer Service telephone number on the front of this notice.

INSURANCE COUNSELING AND ASSISTANCE:

Insurance Counseling and Assistance programs are located in every State. These programs have volunteer counselors who can give you free assistance with Medicare questions, including enrollment, entitlement, Medigap, and premium issues. If you would like to know how to get in touch with your local Insurance Counseling and Assistance Program Counselor, please call us at the number shown in the Customer Service Information box on the front of this notice.

Preventive Health Attitudes and Practices Of Elderly Persons Attending Senior Centers

Alison A. Moore, MD, MPH, Carol Dorros, MD,
Douglas P. Kiel, MD, MPH, Patricia S. O'Sullivan, EdD,
and Rebecca A. Silliman, MD, PhD

Among the elderly, health behaviors and preventive services may decrease morbidity and mortality from acute and chronic disease and may also reduce or postpone a decline in functioning. Many professional societies and task forces have recommended specific preventive health measures to be considered for the elderly such as bi-annual measurement of blood pressure and yearly influenza vaccination.¹⁻⁷ Adherence to these measures, however, varies widely. Most studies report suboptimal rates of participation in disease prevention/health promotion activities.⁸⁻¹⁴

Senior centers are sites where community-dwelling older persons may participate in a variety of social, educational and physical activities.¹⁵ Many centers also focus on health and offer educational programs and limited preventive health services. We surveyed persons attending senior centers to determine: 1) how important they perceived specific preventive health behaviors and services to be; 2) if they participated in these preventive health activities or received these services more often than other elderly cohorts; and 3) barriers to participating in these preventive health activities. We also surveyed senior centers to ascertain what services they offered.

Methods

Three hundred senior center participants in six Rhode Island centers each completed a questionnaire asking about preven-

Alison Moore, MD, an internist/geriatrician, is assistant professor of medicine at University of California at Los Angeles. Carol Dorros, MD, an internist, is a staff physician at Harvard Community Health Plan in Warwick, RI. Douglas Kiel, MD, an internist/geriatrician, is assistant professor of medicine at Harvard Medical School. Patricia O'Sullivan, EdD, a health services researcher, is a clinical associate professor of nursing at the University of Arkansas for Medical Sciences College of Nursing. Rebecca Silliman, MD, PhD, an internist/geriatrician, is associate professor of medicine at Boston University Medical Center Hospital and Boston University School of Medicine.

tive health behaviors and interventions recommended for older persons: seat belt use, influenza vaccination, exercise, blood pressure measurement, mammography, and breast, pelvic and eye examinations. For each of the preventive health measures, we asked: 1) how important the behavior was (using a 4-point scale ranging from very important to not important at all); 2) whether they engaged in the behavior or received the intervention; and, if not, 3) what barriers they perceived (both open- and close-ended responses possible). All senior centers are located in Providence or surrounding towns. We obtained information from each center on the availability of health services and educational programs, staff health care professionals, and transportation to health care

... most of the centers were staffed with health care professionals and had a readily available means of transportation to health care appointments.

appointments.

Because most respondents reported each of the health behaviors as very important and a small minority reported the behaviors as not important at all, we collapsed the data on the four rated categories of importance into two categories, important vs not important, for our analysis of the relationship between the respondents' rating of importance and reported practice of a particular health behavior. Chi square tests ($P < 0.05$ being considered significant) were used to assess the strength of the association between variables. ANOVA was used to determine if there were differences between groups on continuously sorted variables. Logistic regression analysis was used to describe the relationships among dichotomous outcome variables and explanatory covariates.

Results

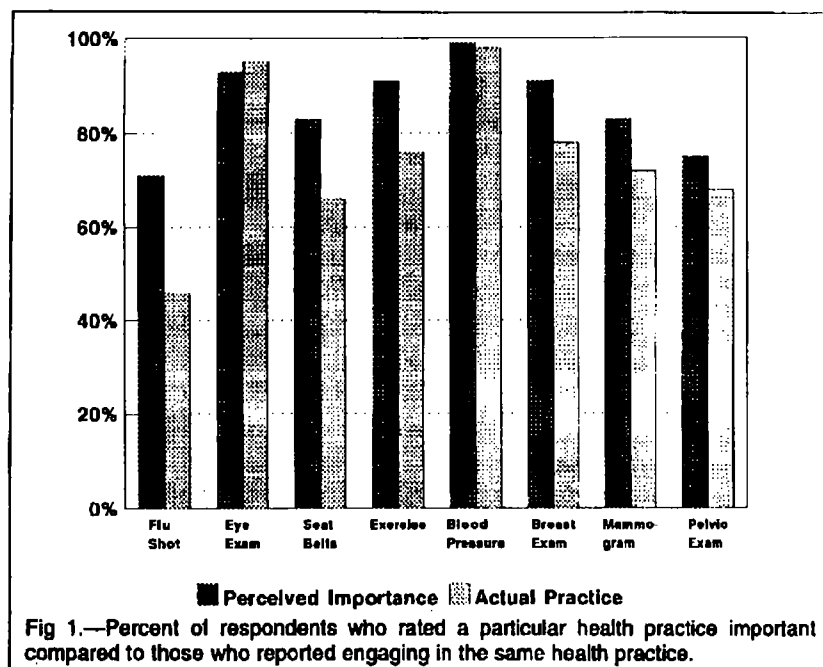
The survey response rate was 100%. Most respondents were female (75%), Caucasian (83%), and had completed some high school (81%); 45% were widowed and 48% reported less than \$10,000 annual income. The mean age of respondents was 73.5

years (SD 7.1). Seventy-five percent of respondents rated their health as excellent or good; 95% reported having a personal physician; and 93% reported that they had someone to rely on when they needed help.

Between 71% and 99% of respondents rated each of the health behaviors important (Figure 1). The percent of respondents who reported participating in the studied preventive health activities varied from 66%-98% with the exception of influenza vaccination (46%). There were no significant differences among centers in either the perceived importance or reported practice of each of the behaviors. While a respondent's attitude towards and practice of each of the health behaviors was related ($P < 0.05$), age, gender, income and educational level were not related to health behavior.

Although most respondents adhered to the studied preventive health measures, 6%-24% of the pertinent respondents reported at least one barrier to obtaining influenza vaccination, mammography, breast and pelvic examinations, and using seat belts and exercising (Table 1). Non-adhering subjects reported ineffectiveness and discomfort as the major reason for not obtaining flu shots ($n=77$ non-adhering) or using seat belts ($n=90$); physical disability or fear of injury were the reasons most often given for not exercising ($n=39$). Not being offered or recommended the examination were the most common reasons given for non-adherence with mammography ($n=19$) and breast ($n=14$) and pelvic examinations ($n=21$).

All centers had educational programs addressing the importance of exercise, blood pressure control and regular eye examinations. Four of the six centers provided influenza vaccinations and had programs to encourage breast cancer screening and seat belt safety, while two centers had similar programs for cervical cancer screening. Five centers had staff health care professionals available to see center members from half day a week to 5 days a week and three centers had vans to take center participants to health care visits. Neither the availability of specific health programs, nor other en-



abling factors such as on-site health care professionals or transportation to health care visits predicted a respondent's likelihood of believing a specific health behavior/intervention important or engaging in that activity.

Discussion

Elderly study participants who attended senior centers in Rhode Island both considered a variety of preventive health activities important and reported engaging in them. These participation rates are generally higher than those reported by previous studies.⁸⁻¹⁴ For example, among a random sample of persons older than 65 years, 21% reported wearing seatbelts regularly and 23% reported exercising regularly.⁹ Among women at least 65 years of age, various studies report rates of mammogram utilization and physician breast examination of 10%-46% and 53%-69% respectively.^{10-12,14} It is possible that both the health education focus and available services at the senior centers and the characteristics of persons who attend senior centers explain these encouraging results.

Since all centers offered some preventive health education and services, these older respondents may have received this education and had easy access to many of the preventive health services studied. To further facilitate preventive health care for seniors, most of the centers were staffed with health care professionals and had a readily available means of transportation to health care appointments. The importance of senior centers in promoting and facilitating good preventive health care is illustrated

by the respondents from Center 4. This center had the most comprehensive array of preventive health programs, a nurse at the center on weekdays, and could transport their members to health care appointments. This center serves a primarily African-

American, low income group of elderly, a population which is among the least likely to engage in health promotional activities.¹⁶ This group, however, reported particularly high rates of belief in and compliance with the studied preventive health behaviors.

Most survey respondents reported good health and social support and a regular source of medical care. In addition, as members of a senior center, they are all involved in a community organization. All these factors are associated with use of health care services and participation in health-promoting activities.^{8,11-13,17,18} Efforts to increase participation in senior centers might effectively increase health promotion activities among many groups of older persons. More diverse populations, including sicker, more functionally disabled persons, could be targeted by developing outreach programs.

Although barriers to participating in preventive health activities were infrequently reported by these seniors, most non-adherers reported that their physician did not offer or recommend the examination. Physicians may fail to consistently promote preventive health because of time constraints in the office, inadequate preventive health cueing systems or both disagreement with and unawareness of the current recommendations regarding health promotion/disease

Table 1.—Barriers to Preventive Health Practice			
Practice	Barriers	N	(%)*
Flu Shot n=160 (54%)*	Makes you sick	52	(34%)
	Not offered	25	(16%)
	Not recommended	24	(16%)
	Hate shots	22	(14%)
	Allergy	17	(11%)
	Other	12	(13%)
Seat Belts n=95 (34%)	Uncomfortable	40	(44%)
	Increase injury	26	(29%)
	Difficult to use	18	(20%)
	Does not prevent injury	6	(7%)
	Other	12	(13%)
	Other	12	(13%)
Exercise n=71 (24%)	Physically unable	28	(45%)
	Afraid of injury	11	(18%)
	No facility	8	(13%)
	Other	13	(21%)
	Other	13	(21%)
	Other	13	(21%)
Breast Exam n=45 (23%)	Not offered	14	(38%)
	Too old to need	13	(35%)
	Uncomfortable	9	(24%)
	Embarrassing	5	(14%)
	Other	13	(21%)
	Other	13	(21%)
Mammogram n=55 (28%)	Not recommended	19	(45%)
	Too old to need	12	(29%)
	Uncomfortable	6	(14%)
	Other	13	(21%)
	Other	13	(21%)
	Other	13	(21%)
Pelvic Exam n=63 (32%)	Not recommended	21	(40%)
	Too old to need	11	(21%)
	Embarrassing	10	(19%)
	Uncomfortable	8	(15%)
	Other	13	(21%)
	Other	13	(21%)

* total percentage may be >100% because respondents could give more than one response

** indicates the percentage of respondents who have not engaged in the behavior

prevention.^{19,20} Physicians might be more successful if they delegated the delivery of many preventive health services to senior center staff health care providers rather than providing them during a typical office visit when other medical care concerns may overshadow preventive health care issues.

Physicians might be more successful if they delegated the delivery of many preventive health services to senior center health care providers rather than providing them during a typical office visit when other medical care concerns may overshadow preventive health care issues.

The findings of this study suggest that senior centers may be ideal sites for both educating and providing preventive health services to the elderly. However, these results may not be generalizable to other populations since the data were obtained from a convenience sample of generally well, elderly persons attending senior centers. As members of a social group, they may have been more likely to report agreement with socially desirable behaviors. Another weakness of the study is that the data were self-reported and there was no external validation of answers. Despite these limitations, we report high rates of participation in a variety of preventive health measures and belief in their efficacy among a group of elderly people attending senior centers in Rhode Island. Further studies of senior centers as sites for preventive health education and provision of health services are needed to substantiate our findings.

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Address correspondence to:

Alison A. Moore, MD
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ORAL HEALTH PROMOTION AND PREVENTION FOR OLDER ADULTS

Lea Erickson, DDS, MSPH

The goal of primary preventive dentistry is to prevent the initiation of disease or to reverse the disease in the early stages. The intervention, whether chemical, mechanical, or change in behavior, must be specific for the disease process. In an aging population, health promotion is generally focused on the prevention of caries, periodontal disease, and oral cancer. With intensive instruction and motivation in oral hygiene at recalls two to four times a year and including topical fluoride treatments, elderly patients with initially poor dental and periodontal status demonstrated the ability to maintain teeth as overdenture abutments over 5 years.¹⁹ In a survey of preventive programs for older adults, deBaat and colleagues²² highlight the need for instruction and demonstration with reinforcement and systematic evaluation. They further suggest that programs be appropriately adapted for the ability of the individual or population for whom they are designed. With a population that is aging with more retained natural teeth than previous generations, an emphasis on adult prevention is necessary. The success of preventive measures in substantially reducing dental caries in children and young adults has resulted in more teeth being retained by adults and has highlighted the success of such programs.

ORAL CANCER

Oral cancers constitute about 3.1% of the 1 million new cases of cancer each year in the United States and are responsible for about 8000 to 9000 deaths yearly.¹⁰⁸ In addition to the mortality, substantial morbidity is associated with treatment of oral cancers. The most common presenting symptoms were pain

From the Department of Veterans Affairs Medical Center, Salt Lake City Geriatric Research, Education, and Clinical Center, Salt Lake City, Utah

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and the complaint of a lump. At the time of diagnosis the spread lesions outnumbered localized lesions 2:1; a 5-year survival rate of 50% for patients with localized lesions on the base of tongue compared with a 22% rate for spread lesions.⁴² Early diagnosis is an essential key to the control of oral cancer.¹⁰⁸

Oral cancer is a disease of older age, with age as the highest risk factor.¹⁰⁸ About 95% of all oral cancers occur in patients over age 40, and in one series 44% occurred in patients over age 65, a cohort accounting for only about 13% of the population. Oral cancer occurs more frequently in men, but the gap is closing. The most common sites are the tongue, oropharynx, floor of mouth, and lips. Current evidence suggests that there are probably multiple causes of every cancer.¹⁰⁹ Cigarette smokers have five times the risk of developing oral cancer compared with nonsmokers, and a strong association has been shown with cigar and pipe smoking and the use of smokeless tobacco. An enhanced carcinogenic effect results from the combined use of tobacco and alcohol.

Preventive activities for oral cancer fundamentally begin with the promotion of smoking cessation in the community. Referral to established programs or tailoring a program for the individual may be the appropriate intervention. A smoking cessation program may include education, aversive training, and drugs including the nicotine-containing products.¹¹⁰ A second preventive strategy is to promote early diagnosis and treatment by encouraging people to seek regular cancer screening examination and by ensuring that the dental profession is providing this service.

DENTAL CARIES

The public's perception that caries is a disease of children and not of older adults is not supported by the literature. The combined incidence of coronal and root caries in Iowans over age 64 was approximately 1.2 surfaces per year in a 3-year study, an incidence reported as higher than that found in school-age children in nonfluoridated areas.⁴⁹ New and recurrent coronal lesions occur, and an increase in root caries appears to be associated with aging.¹⁰ Surprisingly, coronal caries exceeded root caries in the Iowa study, and the vast majority of both coronal and root lesions (86%) were on previously sound tooth structure.³⁹

Root caries is regarded as an infectious process differing little from coronal caries.^{12, 42} The classic triad of factors must be present for disease to occur—a susceptible host (exposed root surface), cariogenic diet, and microbial plaque. The organisms potentially implicated in coronal caries (*Streptococcus mutans* and *Lactobacillus*) are also associated with root caries.^{37, 53} A significantly greater solubility of root mineral in acid was observed than of enamel (critical pH of demineralization of 6.7 compared to 5.5 in enamel).⁶³ The dietary cause of root caries appears similar to that of coronal caries with a significant association between root caries and both high sucrose intake and high frequency of sugar exposures.^{37, 63, 64}

A root caries incidence of 1.0 to 1.5 new decayed or filled lesions per year has been reported.⁹ Maxillary teeth except molars were most frequently involved and mandibular incisors and canines the least. Clinical data suggest the surfaces most affected are the distal and buccal, whereas data gathered from extracted teeth suggest those most affected are mesial and distal surfaces.¹⁰⁷ Active root lesions may be converted to inactive lesions, with inactive lesions occurring more frequently on the incisors and canines than the molars and premolars.⁹³

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RISK ASSESSMENT

Risk assessment is a useful tool for planning either a preventive program for an individual or a health promotion program for a community with the first step identifying risk factors.^{10, 12, 23, 37, 65, 92, 93} The best predictor of root caries risk appears to be the previous root caries experience of the individual. A list of other factors identified as risk factors for root caries development follows:

- Previous root caries experience
- Bacterial plaque (quantity and composition)
- Exposures of fermentable carbohydrates
- Oral sugar clearance
- Previous coronal caries experience
- Saliva (quantity and quality)
- Newly exposed roots
- Number of exposed roots
- Active periodontal therapy
- Smoking
- Onset of systemic illness
- Lack of social integration and support
- Number of periodontal pockets >3 mm in depth
- Fewer than nine remaining teeth

The more risk factors an individual experiences, the more aggressive the intervention must be. The risk assessment directs which interventions must be pursued. Plaque control measures, fluorides and other chemotherapeutic agents, salivary stimulation, and dietary counseling are among the most common approaches. See Table 4 regarding risk assessment and prevention of root caries in the article by Shay elsewhere in this issue.

PERIODONTAL DISEASE

The retention of more teeth with age results in more teeth at risk for periodontal disease. Because periodontal disease is caused by specific pathogens in bacterial plaque, the goal of a primary preventive program is to control the level of plaque or to attenuate its effect by mechanical and chemical means. The role of aging in periodontal disease has not been well described. "The increased prevalence and severity of periodontal disease in older adults does not appear to be the result of increased susceptibility because of aging, but, rather, the more likely result of increased additive influence of sequential lesions over time."¹²³ Phase 1 of the Third National Health and Nutritional Examination Survey (NHANES III) found that the prevalence of moderate and severe attachment loss and gingival recession increased with age but that the prevalence of periodontal pockets greater than 4 mm and greater than 6 mm did not.¹⁶ The prevalence of pocket depths greater than 4 mm was, however, considerably higher among patients residing in long-term care facilities.⁸⁷

SALIVARY FUNCTION

Xerostomia has been quantified as a salivary flow of less than 0.2 mL/min¹⁰⁹ or as less than 0.1 mL/min.¹¹⁶ Causes of diminished salivary flow include autoimmune diseases, head and neck radiation, and medications. Drugs affect-

ing salivary function include anticholinergics, antihistamines, major tranquilizers, antidepressants, antiparkinson drugs, antianxiety drugs, opiates, antihypertensives, and diuretics.⁷⁰ Salivary aplasia, Sjögren's syndrome, tumors, obstruction, infection, excision, and radiation directly affect the function of the salivary gland, and factors affecting fluid and electrolyte balance may contribute to decreased salivary function. Consequences of xerostomia include increased dental caries—especially root caries—and periodontal disease, mucositis, difficulty with speech, dysphagia, increased candidiasis, increased dentinal sensitivity, altered gustation, bad breath, and decreased denture retention.

Although xerostomia is considered to be a common symptom, it is often regarded as trivial by both dentist and patient and is probably underreported. The role of aging in salivary function remains somewhat controversial. The long-held assumption that diminished salivary flow was an inevitable age-related change was challenged by the finding of no decreased function across the age span in healthy unmedicated volunteers.⁷¹ Aging changes in the glands are well established and may represent diminished functional reserve rendering older adults at greater risk for xerostomia. Independent of the relationship between salivary flow rates and age, many older persons experience xerostomia. The prevalence of chronic diseases increases with age as does the concomitant increase in medication usage. A review of the list of drugs causing decreased salivary flow reveals several categories that are commonly used to manage diseases associated with aging. To compound the problem, many elderly are on multiple medications. Additionally, many of the diseases associated directly with reduced salivary flow are also associated with aging.

Although some include the subjective complaints of dryness in the definition of xerostomia,¹¹⁶ complaints of dry mouth during the day or night have not correlated well with actual measurable xerostomia.¹¹ Questions that have predicted xerostomia and might be included in a risk assessment tool are: (1) Do you experience dryness during a meal? (2) Do you need to sip liquids to swallow dry foods? (3) Do you have difficulty swallowing? (4) Does the amount of saliva in your mouth seem too much, too little, or you don't notice it? The risk assessment of salivary function should also include actual measurement of salivary flow.

Strategies for dealing with the effects of xerostomia include replacement of saliva, stimulation of saliva, and mitigating the effects of a dry mouth. Systemic delivery of pilocarpine (Salagen, MGI Pharma, Inc.) is a promising salivary stimulant,^{10, 37, 70, 95, 96, 125} and topical delivery appears to diminish subjective complaints of xerostomia.^{31, 48} Chewing sugarless gum and sucking sugarless candies stimulate flow if residual function is available. Gum sweetened with xylitol has the added benefit of reducing caries.^{56, 72, 73} Frequent sips of water and sucking ice chips diminish the discomfort of dryness, but use of artificial saliva has a more sustained effect by coating the mucosa. Aggressive use of oral hygiene measures, use of fluoride, and use of antibacterial agents are essential interventions to reduce the risks associated with xerostomia.

MECHANICAL REMOVAL OF PLAQUE

Mechanical removal of plaque remains the foundation of oral disease prevention with the toothbrush the first line of defense. Control of caries and control of gingival and periodontal inflammation are obvious goals for dental professionals, but the secondary benefits to the patient, including improved

or tranquilizers, antihypertensives, tumors, infection of the salivary glands may contribute to the increased incidence of periodontitis, gingivitis, and dental caries.

Furthermore, it is often underreported. The overall prevalence of the avoidable age-related changes in the salivary glands is rendering the relationship between xerostomia and concomitant gingivitis and decreased ability to manage oral health in older adults are on a downward trend.

In the definition of oral health, it might have not been stated that the patient should be able to swallow without difficulty, without the risk of aspiration pneumonia.

The placement of the toothbrush. Systemic and local salivary gland dysfunction, subjective and objective, including sugarless and sweetened with flavors of water and the use of oral care are essential.

disease prevention of caries and periodontal disease for dental health.

appearance, reduced mouth odor, and less interference with taste, may be of equal significance.

Dexterity and motivation are directly related to the ability to remove bacterial plaque effectively.⁶¹ Diminished cognitive status, decreased visual acuity, or loss of strength or function of hands may substantially alter an individual's ability to maintain oral hygiene successfully. Visual impairment, cataracts, arthritis, and orthopaedic impairment are four of the top 10 chronic conditions of people over age 65.⁶² This segment of the population constitutes a diverse group, frequently categorized by age or by functional status. For purposes of planning preventive care, the functional status (independent, frail, or functionally dependent) is a key consideration. The plan for a fully independent senior with minimal disability differs significantly from that provided by an aide in a long-term care facility. When questioned about the role of teeth on the quality of life, older adults responded that appearance and eating were the most significant benefits of teeth.¹²¹ Strauss and Hunt¹²¹ emphasize that understanding the values and perceptions about teeth is important in assessing motivation in pursuing dental preventive programs.

Toothbrushing

The toothbrush is the principal device for mechanical removal of plaque. In a study of community-dwelling elders, more than 93% reported brushing their teeth at least once daily, whereas 60% reported they never flossed.⁴⁴ The preferred technique for brushing is the sulcular method with the objective of disturbing the plaque without damaging surrounding soft and hard tissues.

A myriad of new designs of both conventional and mechanical toothbrushes have been introduced in the marketplace. Selection of a toothbrush should be specific for the needs of the patient. Factors to consider include size, ease of use, efficacy at plaque removal, cleansability, durability, and cost.⁶⁰ The brush with flat bristles advocated for many years continues to demonstrate efficacy at plaque removal and gingivitis reduction.¹³⁸ With the aid of computer-assisted design, the flat-bristle brush has undergone unprecedented bristle redesign with the goal of increased plaque removal and efficacy at interproximal access.¹⁰⁶ Four complex-bristle design brushes have resulted in significant reductions in plaque and gingivitis scores (Colgate Total [Colgate-Palmolive], New Improved Crest Complete [Procter & Gamble], Reach Advanced Design, and Oral B Advantage [Oral B Laboratories]). Colgate Total's clinical performance was significantly better than the other three. A brush with deep ripples (New Improved Crest Complete) provided significantly superior overall and gumline penetration relative to the other brushes (Colgate Total, Oral-B Advantage).^{130, 131} Regular replacement of toothbrushes, especially when the bristles become worn and splayed, is generally recommended. Devices that effectively reduce deterioration are available (Gregory Clamp),¹⁰⁴ but the effect of toothbrush wear on plaque removal is not fully established.^{29, 45, 66}

A regular manual toothbrush may not be the oral hygiene device of choice for persons with any disability affecting their dexterity or requiring a caregiver to provide oral hygiene care. Arthritis, which affects greater than 40% of persons aged 65 to 74,⁶³ may substantially affect the ability to grasp and manipulate a toothbrush. Other disabilities, such as those caused by strokes, may have a significant impact on the performance of oral hygiene. Toothbrush handles can be adapted for the specific needs of the patient. The handle can be built up to accommodate reduced grip strength by wrapping it with materials such as a

wash cloth, aluminum foil, thin foam plastic, or custom tray acrylic or by inserting it into a rubber ball, a sponge hair roller, or a plastic bicycle handle grip (Fig. 1). This market is being recognized, and adaptive devices are being made by dental products manufacturers (PHB Geriatric Slip-on [PHB, Inc.]). If the patient is completely unable to grasp a handle, the brush may be adapted so that it can be secured to the hand by means of utensil holders, universal cuffs,^{39, 67} Velcro straps, or handles through which the hand can be placed. Elongated or specially curved handles may be needed to reach the mouth. Extensions may be constructed from inexpensive wooden dowels or PVC pipe from a hardware store.^{39, 67} Consultation with an occupational therapist may provide an avenue for new ideas and commercial products to assist with activities of daily living. Occupational therapy textbooks recommend electric toothbrushes for persons who have difficulty manipulating a manual toothbrush.^{39, 67}

An oscillating/rotating electric toothbrush (Braun Oral B Plaque Remover) was significantly better in vitro at stain removal than a manual and a sonic (Sonicare [Optiva Corporation]) toothbrush.¹⁰³ In clinical trials, the oscillating brush was significantly more effective than the manual brush at stain removal from lingual surfaces.⁷⁶ Substantial numbers expressed preference for the oscillating brush. The same oscillating/vibrating brush was more effective at plaque removal than a brush with a combined longitudinally and laterally moving head (Philips HP 500, Norelco Dentiflex).¹⁷⁶ Literature on automatic brushes focuses on (1) the Braun Oral B Plaque Remover, (2) the Sonicare and (3) the Norelco Dentiflex; a more complete list of available products is found in Table 1.

Although differences were demonstrated between products in research studies, the ultimate concern remains with the individual patient and what device each can most effectively manipulate. The cost differential between a conventional toothbrush and an automatic brush is substantial and may constitute an unnecessary expense. Assessment of ability remains the fundamental process in determining the appropriate plan for preventive maintenance.

A particular challenge is oral hygiene provided by a caregiver. When a

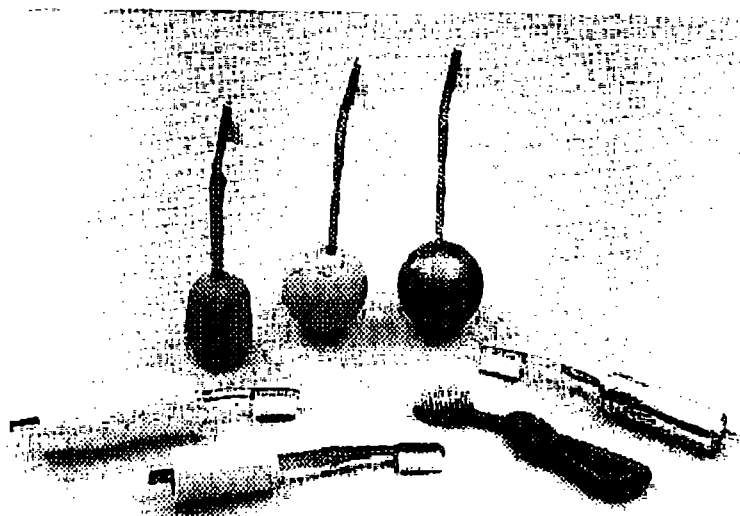


Figure 1. Toothbrushes adapted for use by persons with limitations with function of hands.

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Table 1. POWER TOOTHBRUSHES AND INTERPROXIMAL CLEANERS

Brush	Manufacturer	Description
Braun Oral-B Plaque Remover	Oral-B Laboratories, Inc.	Cup-shaped, oscillating brush head
Braun Oral-B InterClean	Oral-B Laboratories, Inc.	Flexible cleaning filament at interproximal with 100 strokes/sec
CyberSonic Sonic Plaque Disintegrator	American Dentronics Incorporated	Sonic energy microcleaning strokes Sonic flossing attachment optional
DentiBrush BT	DentiBrush	Battery operated
Dentiflex	Norelco Consumer Products	Dual-action brush head, pressure response system
Gingibrush	U.S. DenTek	Rotating bristles, cone-shaped tuft
Interplak Power Plaque Remover	Bausch & Lomb	Individual rotating tufts, counterrotating bristles
OralGiene	OralGiene, Inc.	Brushes upper and lower, facial and lingual simultaneously
Panasonic Power Floss and Brush	Panasonic Corporation	Reciprocating and oscillating motion Reciprocating motion of floss
PHB Battery Powered Toothbrush	PHB, Inc.	Microscopic vibrations
Plac Trac PT-100	Plac Trac	Two multitufted disks on one brush
Plaque Control 3000 Plaque Removal Instrument	Teledyne Water Pik	Ergonomic handle, standard brush with circular motion
Power Toothbrush & Automatic Flosser	Ohio Health Care Products, Inc.	Two heads with counterrotating reciprocating motion, Flosser—floss only moves
Rota-Dent Professional Plaque Removal Instrument	Pro-Dentec: Professional Dental Technologies, Inc.	Rotary brush action, has brush tips and pointed interdental cleaners
Rowenta Plaque Removal System	Rowenta, Inc.	Rotary brush head and pointed gingival cleaner with figure-8 motion
Sensonic Plaque Removal System	Teledyne Water Pik	Sonic energy, microstrokes
Sonicare	Optiva Corporation	High-frequency vibrating bristles
Sonic Power-Proxi	Ortho Arch Company	Sonic powered with interproximal brushes and regular brush head
Sunbeam Automatic Angle	Sunbeam Corporation	Automatic toothbrush
Ultrasonex Ultrasonic Toothbrush	Sonex International Corporation	Manual toothbrush with ultrasonic emitter in brush head

tion of hands.

nondental layperson acted as care provider for a group of volunteers, an electric toothbrush with tufts that rotate reciprocally (Interplak [Bausch & Lomb Oral Care Division]) and a manual toothbrush with curved bristles on the lateral aspect of the brush head with straight bristles in the center (Collis Curve) were the most effective at plaque removal.⁶¹ A disposable foam device (Abco) was the least effective. The volunteers reported that the Collis Curve was the most comfortable, and the care provider regarded it as the easiest to use. Although no differences in plaque levels and gingival inflammation were shown between a three-headed brush (Superbrush) and a conventional brush, the authors recommend the triple-headed brush for certain populations because of the ease of demonstrating its use and for oral hygiene provided by caregivers.¹⁰⁰ Creative solutions to the challenges of plaque removal with physical disability or by a caregiver can be expected to continue to emerge as the population ages. Two other products that clean occlusal, facial, and lingual surfaces simultaneously are a manual brush (Dentrust [Stratas Product Development Group]) and an automatic brush (Oralgene), which simultaneously cleans the maxillary and mandibular teeth. If this innovative design demonstrates adequate efficacy, safety, and durability, it may be an ideal product for caregiver use.

The Peak-Vac brush attaches to a suction source for use on severely debilitated patients and appears particularly useful where there is an aspiration risk (Trademark Medical).

When toothbrushing is difficult or not possible, foam brushes (Toothettes) are often used. Brushing with a toothbrush is significantly more effective than using a foam brush in controlling plaque.⁶¹ A foam soaked in chlorhexidine is significantly more effective than the foam brush alone and may provide a reasonable alternative to tooth-brushing. In addition, fluoride gel applied to facial surfaces of teeth with a foam applicator resulted in an increase in salivary fluoride that persisted throughout the 3 hours of the study, a result significantly better than with an over-the-counter fluoride rinse.¹⁰⁰ Nursing staff are accustomed to using foam brushes and may easily accept protocols that utilize them for application of therapeutic agents.

Other Devices

Although the toothbrush is fundamental to oral hygiene, it is limited by its inefficacy at cleaning interproximally and under and around prostheses. The standard device for interproximal cleaning is dental floss, but 60% of seniors have reported that they have never flossed.⁴¹ The challenge of interproximal cleaning must be approached practically. Assess the patient's dexterity to avoid asking the impossible. If necessary, a floss holder may be added to the armamentarium, keeping in mind that wrapping the floss on the holder requires dexterity as well as visual acuity. Prethreaded floss holders are available, but many are small and may be of little assistance. Of greatest importance is to listen to the patient and hear what he or she is willing to learn. Interproximal brushes may be a better solution for many older patients if they have some recession and open gingival embrasures. Not only are the interproximal brushes easier to handle than floss, with recession and the possible exposure of concavities on root surfaces, but also they may be more effective at contacting root surface for plaque removal. The interproximal brushes placed in a handle are probably easier for most older people to use than those in which the wire is held directly. Visual acuity and dexterity, however, may result in difficulty placing the brushes into the handle. A more recent design change (Butler Proxabrush) has simplified

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the process, but the ability to accomplish the brush change should be assessed and strategies planned if difficulties are encountered. Several automatic interproximal devices were identified and are listed in Table 1. Floss threaders provide access under bridge pontics, and yarn or tufted floss (Superfloss [Oral-B Pharmaceuticals]) may enhance cleaning. The same issues of vision and dexterity may render floss threaders useless. Caregiver training may be a solution for some of the limitations. The essential component in creating the plan for mechanical plaque removal is knowing what the capabilities and limitations of the patient and caregivers are, if appropriate.

Denture Cleansing

Thorough cleansing of all prostheses should be completed daily with a denture brush or toothbrush. If the patient has limited dexterity, a brush with suction cups can be attached to a surface such that only one hand is required. Suggesting that the patient place a wash cloth in the sink before cleaning may reduce the risk of breaking dentures. Generally, leaving dentures out at night is recommended, and many denture wearers use the time to soak the dentures in a cleanser. Among denture wearers surveyed at Cardiff Dental Hospital, 34% wore their dentures 24 hours a day.²⁷ Of those who left the dentures out at night, 61% soaked them in a cleanser.

Of the total using denture cleansers, 48% used an alkaline peroxide product. The least staining was evident in the group who used hypochlorite as an immersion cleanser. Staining was also low for those using abrasive and acidic cleansers. Increased staining was associated with smoking, the age of the denture, and wearing dentures at night.

Daily cleansing of prostheses for institutionalized patients needs regular reinforcement of care staff. Five to 10 minutes in an ultrasonic cleaner, followed by a light brushing and thorough rinsing, is a convenient way for dentures to be cleaned efficiently and effectively in a nursing facility.³⁶ Each patient should have an individual beaker, and the dentist should select the appropriate cleaning agent. Most people who have provided dental consultation to a long-term care facility have had a nurse or administrator tell the story of a new, enthusiastic aide who collected dentures from all residents and carried them to a single location for cleaning. Dentures should be labeled with the patient's name, initials, or identification number³⁶; some states require such labeling.³² A small area on the buccal flange can be roughened with sandpaper, marked with pencil, and sealed with two coats of clear fingernail polish.³⁶ A similar commercial product is the Indenture (Geri Products) denture marking system.

CHEMOTHERAPEUTIC AGENTS

Fluoride

In comprehensive reviews of the literature, numerous studies conclude that topical fluoride can both arrest the carious process in incipient lesions and create a more caries-resistant enamel surface.^{17, 74} Fluoride appears to control the progression of dental caries by inhibiting demineralization and enhancing remineralization.^{17, 26, 136} Although there remains some controversy over the role of fluoride in the prevention of initial lesions, data support the concept that protection from demineralization is derived from the increased porosity and

surface area of early lesions permitting large amounts of fluoride delivery to occur. The diffusion of mineral from the hydroxyapatite secondary to contact with acidogenic plaque creates the white-spot lesion of initial caries. Fluoride assists the restoration of the enamel surface by enhancing fluorohydroxyapatite deposition and crystal regrowth in the remaining lattice.²⁵

The role of fluoride with coronal enamel is well established, but less research has been conducted on its role in root caries prevention. Without evidence to indicate that the pathogenesis of disease for root caries differs from coronal caries, fluorides can "be considered to be the cornerstone of root caries prevention."¹⁷ Substantially lower root caries experience was shown for lifelong residents of a community with therapeutic levels of fluoride in the water than for residents of a community with low fluoride levels.¹¹⁸ A dose response was suggested by a significantly lower prevalence of root caries in a community with five times the optimal fluoride concentration compared with a community with optimal concentration.²⁰

A key factor in the role of fluoride in caries prevention appears to be topical availability at times of cariogenic challenge.^{17, 26} Maintaining ambient levels of fluoride in the mouth has replaced the concept of delivering specific amounts systemically or topically.¹⁷ The efficacy of delivering lower doses with greater frequency has been demonstrated, and the delivery of fluoride with intraoral controlled-release methodology shows promise.^{17, 96} Prosthodontic and orthodontic appliances may act as localized reservoirs for such therapeutic agents.⁹⁴ Prototypes of sustained-release fluoride products in development include varnishes and microencapsulated fluoride in aerosol form, to be placed and retained in gingival pockets and to be bonded to the teeth or appliances. All theoretically bathe the oral cavity with fluoride as it is slowly released. Patients with functional disabilities limiting the ability to perform oral hygiene procedures may particularly benefit. A related issue in the delivery of fluoride is recognition that the majority of root surface lesions are located interproximally,¹⁰⁷ making penetrance of the product a challenge. Oral hygiene measures must be adapted to deliver fluoride to interproximal surfaces.

Although topical fluoride at high concentrations appears to have a direct antiplaque effect, the magnitude of effect from over-the-counter concentrations has only minimal effect in vitro on the acid production activity of plaque.¹³⁶ The potential effect of fluoride on plaque in multiple exposures, in altering the microflora, or in other antiplaque activities may lead to the development of new anticaries strategies including combination agents.^{17, 136}

Fluoride Formulations and Additives

In vitro simulations suggest that intraoral fluoride concentrations attained after rinses with 0.025%, 0.2%, and 1.0% sodium fluoride are effective and exhibit a dose response in inhibiting root demineralization and enhancing remineralization.⁴ In an animal study, titanium tetrafluoride was the most effective in root caries prevention followed by stannous fluoride, copper fluoride, and acidulated phosphate fluoride. Despite the theoretical superiority of monofluorophosphate on the basis of mineral content, sodium fluoride and monofluorophosphate are nearly equivalent in clinical caries inhibition.⁷⁷ A 36-month follow-up study comparing 5% sodium fluoride-containing varnish professionally applied every 3 to 4 months, 0.4% stannous fluoride-containing glycerol gel professionally applied every 3 to 4 months, and 0.05% sodium fluoride mouth rinse used daily at home showed no significant difference in the incidence of

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new root caries. The authors of the article question, however, whether the power to detect the difference was below an adequate level⁹³ and report a trend toward fewer new lesions in the sodium fluoride group. A fluoride varnish applied twice a year appears to compare favorably with biannual applications of acidulated phosphate fluoride in children¹⁰⁶ and resulted in significantly lower increases in new root caries than the control group.¹⁰²

Fluoride has been introduced into dental materials to prevent dental caries. The intent of such products may be to provide a reservoir for sustained release of fluoride for caries prevention or specifically to prevent recurrent caries.^{94, 95} Anecdotal evidence has supported the caries-resisting activity of silicate cement and glass ionomer. Fluoride has been added to varnishes, dentin bonding agent, sealants, composites, and amalgam alloys. Fluoride-containing amalgams have been shown to inhibit the formation of carieslike lesions immediately adjacent to the filling material in vitro in both enamel and root surface lesions,¹¹² but concern exists about porosity created as the fluoride diffuses out.⁹⁴ Although these concepts are empirically logical, controlled clinical trials should be completed to demonstrate efficacy.

Fluoride products of various formulations and concentrations are commercially available. The most commonly used products are the dentifrices containing fluoride, which should be recommended for all older patients. Over-the-counter mouth rinses with low concentrations of fluoride may also be used by patients with relatively low caries risk. These products are listed in Table 2. If patients demonstrate a number of risk factors for caries (see earlier), fluoride products of higher concentration should be incorporated into the preventive plan. See Table 3 for a list of products available by prescription containing stannous fluoride and sodium fluoride. A 1.1% sodium fluoride product of interest is the Prevident 5000 Dentifrice that has incorporated an abrasive and eliminates the two-step process of first brushing and then applying the fluoride. Older adults can benefit from regular office fluoride treatment as a supplement to home applications.

Dentifrices

Dentifrices with accepted therapeutic benefit were introduced in the mid-1950s. A continuing evolution in therapeutic products has led to dentifrices that manage caries, calculus formation, and dentinal sensitivity. The initial stannous fluoride formulation with clinical evidence of anticaries action was followed with monofluorophosphate, sodium fluoride, and organic and acid-phosphate fluoride products and later with antiplaque and anticalculus preparations.¹¹⁹ The

Table 2. OVER-THE-COUNTER FLUORIDE RINSES

Product	Concentration	Manufacturer
Reach Act Fluoride Anti-Cavity Treatment	0.05% sodium fluoride	Johnson & Johnson
Fluorigard Anti-Cavity Fluoride Rinse	0.05% sodium fluoride	Colgate Oral Pharmaceuticals
Oral B Anti-Cavity Dental Rinse	0.05% sodium fluoride	Oral B Laboratories
Listermint with Fluoride Anti-Cavity Fluoride Rinse	0.02% sodium fluoride	Warner Wellcome Consumer

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Table 3. FLUORIDE PRODUCTS FOR HOME USE

Product	Concentration	Manufacturer
Phos-Flur Daily Oral Rinse	2.2% neutral NaF	Colgate Oral Pharmaceuticals
Prevident Gel	1.1% neutral NaF	Colgate Oral Pharmaceuticals
Prevident 5000 Plus Dental Cream	1.1% neutral NaF	Colgate Oral Pharmaceuticals
Pro-Dentx Home Fluorides	1.1% neutral NaF	Professional Dental Technologies
Thera-Flur-N Gel Drops	1.1% neutral NaF	Colgate Oral Pharmaceuticals
Neutrasure Home Topical	1.1% neutral NaF	Colgate Oral Pharmaceuticals
Gel-Kam Gel	0.4% SnF ₂	Colgate Oral Pharmaceuticals
Stanimax	0.4% SnF ₂	SDI Laboratories
Stop Gel	0.4% SnF ₂	Oral-B Laboratories
Gel-Tin	0.4% SnF ₂	Young Dental Manufacturing Co.
Pro-Dentx Home Fluorides	0.4% SnF ₂	Professional Dental Technologies
Omnii Med	0.4% SnF ₂	Omnii International
Gel-Kam Oral Care Rinse	0.63% SnF ₂	Colgate Oral Pharmaceuticals
Perio Med	0.63% SnF ₂	Omnii International
Perio Maintenance Rinse	0.63% SnF ₂	Dental Resources, Inc.
Stanimax	0.63% SnF ₂	SDI Laboratories
Pro-Dentx Home Fluorides	0.63% SnF ₂	Professional Dental Technologies
Point-Two Dental Rinse	0.2% NaF	Colgate Oral Pharmaceuticals
Prevident Dental Rinse	0.2% NaF	Colgate Oral Pharmaceuticals
Fluorinse	0.2% NaF	Oral-B Laboratories

NaF = sodium fluoride; SnF₂ = stannous fluoride.

fluoride dentifrices have been shown to be effective in both caries prevention and remineralization in a concentration of 1000 to 1100 ppm. The Council on Dental Therapeutics of the American Dental Association published guidelines for caries clinical trials that describe parameters for equivalency or superiority relative to one or more formulations of known efficacy.²⁴

Anticaries Effect

The therapeutic benefits of dentifrices containing 0.243% sodium fluoride is well established and accepted to the point of serving as the gold standard against which new formulations are measured. The benefit has repeatedly been shown in younger populations, although less clinical research has been completed with older adults. One study indicates the incidence of both coronal and root caries was significantly reduced in a population of older adults using a sodium fluoride dentifrice at 1100 ppm compared with a placebo.²⁶ The addition of dicalcium phosphate dihydrate as an abrasive to monofluorophosphate dentifrices may result in added anticaries efficacy.¹³ The dicalcium phosphate dihydrate/MFP dentifrice (Colgate Dental Cream) significantly improved remineralization in an intraoral model when compared with MFP silica formulation.¹⁴² An in situ evaluation of three sodium fluoride-containing preparations showed significantly more remineralization in enamel and less demineralization of root surface compared with a placebo containing no fluoride.²⁸ Remineralization of simulated carious lesions intraorally was significantly greater for dentifrices containing MFP and NaF with or without pyrophosphate than for a placebo containing no fluoride. No differences among the fluoride products were observed.

Anticalculus Effect

Three commercially available anticalculus formulations containing (1) 1.3% soluble-pyrophosphate salts and 1.5% copolymer in a 0.243% sodium fluoride/silica base (Colgate Tartar Control), (2) 0.3% triclosan (a phenolic compound) and 2.0% of a PVM/MA copolymer in a 0.243% sodium fluoride/silica base (Colgate Total), and (3) 0.3% triclosan and 0.75% zinc citrate in a 1.14% monofluorophosphate/silica base (Pepsodent Ultra [Chesebrough-Pond's USA]) produced statistically significant reductions in supragingival calculus formation when compared with the placebo (0.243% sodium fluoride/silica base). No significant difference in efficacy was demonstrated among the three anticalculus formulations.⁷ In patients using 0.12% chlorhexidine oral rinse known to increase calculus and stain formation, an anticalculus dentifrice containing 3.3% pyrophosphate (Crest Tartar Control) reduced calculus occurrence and severity when compared to an otherwise similar toothpaste without the pyrophosphate.¹⁵ Both Colgate Tartar Control formula and Colgate's new Micro Cleansing Tartar Control dentifrice reduced chlorhexidine stain, with significantly greater reduction by the new formulation.¹⁴⁰ Colgate's Platinum removed stain more effectively than either a low abrasive placebo or Crest Tartar Control.¹³⁹

Antimicrobial Effect

Stabilized stannous fluoride formulations at two different concentrations (Crest Gum Care) produced substantially greater inhibitory effects on the production of plaque acids than did the control dentifrice containing sodium fluoride in a trial of single brushing.⁷¹ Similar inhibition of plaque metabolic activity and regrowth were demonstrated in a 9-week study when compared with a placebo of the same formulation as the stannous fluoride product but without the active ingredient. No change in plaque composition over 6 months was demonstrated in a clinical trial suggesting microbial safety (i.e., no concern about bacterial resistance or overgrowth).¹³² In clinical trials, significant reductions in inflammation and bleeding were observed in the groups using stabilized stannous fluoride products when compared to a sodium fluoride preparation, but no differences in plaque scores emerged.^{11, 86} The apparent conflict between the observed decrease in inflammation without an obvious change in plaque may be explained by a change in bacterial metabolism caused by the stannous fluoride resulting in *less pathologic plaque* rather than in altered microbial numbers.¹³² This effect was demonstrated in vivo when acid production was significantly inhibited by a stannous fluoride dentifrice (Crest Gum Care) when compared with a sodium fluoride formulation (Crest Regular).¹³⁵

In comparing a fluoride-containing baking soda-hydrogen peroxide dentifrice (Mentadent) with a placebo (Crest) in postperiodontal surgery patients, the soda-peroxide preparation demonstrated significantly less redness at 7 days with a continuing trend at 14 days. No significant differences were observed in plaque indices.³⁴ The use of an AmF/stannous fluoride toothpaste followed by an AmF/stannous fluoride mouth rinse (Meridol) by one group and a sodium fluoride toothpaste and a sodium fluoride mouth rinse resulted in significant reductions in plaque and inflammation. There was a trend toward more reduction in the plaque index in the AmF/SnF₂ fluoride group; the difference was not statistically significant.⁶

A dentifrice containing the antibacterial agent triclosan (0.3%), 2% copolymer, and 0.243% sodium fluoride resulted in a 17% reduction in supragingival dental plaque and a 29% reduction in gingival inflammation when compared to

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one containing only 0.243% sodium fluoride.¹¹¹ No significant differences were shown between a triclosan/copolymer dentifrice and a conventional fluoride toothpaste in plaque inhibition.¹³ The frontiers of therapeutic dentifrices are expanding with many promising opportunities.

Mouthrinses and Chlorhexidine

For patients who cannot or will not adequately remove plaque, an effective chemotherapeutic agent that does not result in resistant organisms and has minimal side effects would be of great value. The antiseptic chlorhexidine has been used in Europe for many years to meet the needs of these patients. Chlorhexidine is a cationic bisbiguanide with a broad spectrum of antibacterial and antifungal activity. It is rapidly adsorbed onto the bacterial cell surface and disrupts the cytoplasmic membrane binding to oral tissues for extended periods, resulting in a sustained-release effect. In the United States, a concentration of 0.12% is available and appears to show significant substantivity, plaque inhibition, and gingivitis reduction at recommended doses.^{30, 59, 115} Chlorhexidine appears to have no equal among mouthrinses for its antiplaque and antigingivitis effect.¹ Several disadvantages make chlorhexidine less than the ideal antiplaque agent. Staining of the teeth and tongue, increased calculus formation, an objectionable taste, and complaints of altered taste sensation are the most common side effects.

Anticaries Effect

An average caries-inhibiting effect of 46% by chlorhexidine was concluded in a meta-analysis of clinical trials on children.¹⁷⁸ This substantial effect was determined in studies that did not restrict participation to high-risk subjects. In a pilot study with functionally dependent elderly patients residing in an intermediate-care facility, a 1% chlorhexidine gel applied with custom trays reduced and maintained decreased levels of cariogenic bacteria in most patients.⁷⁵ Another high-risk group, patients with impaired salivary function secondary to medication usage, had reduced levels of streptococci for up to 9 weeks after professional administration of chlorhexidine gel in trays three times per day for 2 days.¹⁶ The concentration (1%) of the gel is considerably higher than the rinse currently available in the United States.

Antiplaque Effect

Ambulatory older adults rinsing daily or weekly with chlorhexidine had comparable reductions in plaque and gingival indices.⁵⁸ In a 12-month study, the early reduction in plaque indices returned to baseline, and although the gingival index showed improvement, the disease progressed. The authors of the study proposed an explanation that the disease burden might exceed the therapeutic potential of the mouthrinse.⁷⁵ Reductions of plaque index and gingival index in mentally handicapped adults was similar for 0.12% chlorhexidine and an essential oil mouthrinse.⁷⁵ Plaque inhibition by chlorhexidine was greater than that by oxidizing rinses, but all were significantly better than the saline control.⁷⁸ Only the chlorhexidine demonstrated a substantivity effect of reducing and maintaining the reduction of bacteria over time.

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Mouth Odor

Factors identified as important in mouth odor were the degree of tongue coating, the amount of bacterial enzyme detected by the synthetic peptide BANA, and the number of bleeding sites.³³ After a 7-day regimen of brushing teeth with dentifrice of choice, brushing the tongue with chlorhexidine and rinsing for 60 seconds with chlorhexidine twice daily, mouth odor and tongue coating were significantly reduced.

Delivery of Chlorhexidine

Reduction of levels of plaque and inflammation in people with disabilities was demonstrated with application of chlorhexidine by metered spraying daily,²¹ by swabbing the teeth and gingiva daily,¹²⁰ and by applying a sustained-release polymer.¹¹⁷ Interference with daily activities by dental problems was reduced in institutionalized patients using chlorhexidine.¹²⁰ Daily use of a gum containing chlorhexidine reduced plaque and gingivitis compared to a placebo gum and at 8 weeks was comparable to a chlorhexidine rinse.¹¹³ Local delivery of chlorhexidine with an interproximal brush resulted in significantly reduced gingival indices compared to both the baseline and the control group.⁶⁹ A creative idea of combining chlorhexidine into a sodium fluoride gel for a single application of therapeutic agents was well accepted by caregivers of persons with mental retardation.²¹ The study did not address the issue of efficacy.

Side Effects

Calculus and mild to moderate stain formation were reported in the chlorhexidine groups independent of concentration (0.2% versus 0.12%).^{3, 120} The main side effects appear to be staining and complaints about the taste and taste alteration,^{25, 113} but they are by no means universal complaints.⁸⁸ The occurrence and severity of calculus and stain may be reduced by the use of dentifrices containing pyrophosphate.^{15, 140}

Other Mouthrinses

Several formulations of mouthrinses are available with varying degrees of reported efficacy but none as effective as chlorhexidine. They may have application, however, where the disease risk is not regarded as high. They have the advantage that they are available without prescription and are lower in cost. Although several other formulations are discussed, the most important are probably those containing fluoride. See Tables 2 and 3 for product lists.

A mouthrinse containing a silicone oil and the antibacterial agent triclosan (0.3%) significantly inhibited plaque formation when compared to a control with neither active ingredient and with a mouthrinse containing only the silicone oil.⁹⁹ The silicone oil was proposed as a means of sustained release because it adsorbs directly to the tooth surface and acts as a reservoir for the lipid-soluble antibacterial substance. A prebrush mouthrinse containing 0.3% triclosan used twice a day resulted in significantly less supragingival calculus formation than the placebo mouthwash.¹²⁴ A concentration of 0.06% triclosan resulted in significantly lower plaque scores than the placebo but significantly higher than chlorhexidine.⁹⁹ Of interest in this study was the finding that greater amounts of new

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plaque formed in areas of preexisting gingivitis than in areas of gingival health for both test groups.

Chlorhexidine was significantly more effective at inhibiting plaque formation than a phenolic mouthrinse (Listerine [Warner Wellcome Consumer]).⁷² Products containing cetylpyridinium chloride and hexetidine as active ingredients demonstrated reduced salivary bacterial counts after rinsing, but the effect was of short duration, and no antiplaque effect was evident.⁷¹ Similar reductions in plaque formation and short-term trends toward lower salivary bacterial counts were seen with oxidizing mouthrinses containing peroxyborate and peroxycarbonate.⁷⁸ Chlorhexidine was significantly more effective than either oxidizing rinse.

In an effort to identify other approaches to plaque inhibition, an antiadhesive was added to a mouthrinse with the idea of inhibiting bacterial adhesion. Plaque indices for both the antiadhesive and antiadhesive plus chlorhexidine were almost identical to the water control.⁷⁷ Both the phenolic (Listerine) and chlorhexidine mouthrinses were significantly more effective at plaque inhibition.

OTHER INTERVENTIONS

Xylitol

Chewing gum containing xylitol as the sweetener has resulted in reduced risk of root surface caries⁷³ and stabilization and arrest of dentinal caries in young subjects.⁷² It may effectively reduce plaque, the virulence of plaque, the acidity of plaque after a sucrose challenge, and gingivitis.^{56, 72}

Root Sealants

A preliminary in vitro caries simulation with extracted teeth suggested that application of a dentin adhesive (Scotchbond Multi-Purpose [3M]) may reduce demineralization of root surfaces.⁴⁷ When more sophisticated measurements were applied, the dentin adhesive (All Bond [Bis Co.]) demonstrated little demineralization as compared to the control.¹²³ A glass ionomer sealant applied to pits and fissures on children demonstrated a significantly reduced caries rate compared to controls despite difficulties with retention.⁶⁸ The fluoride released by the sealant was presumed to sustain the anticaries effect. Perhaps a glass ionomer sealer on root surfaces has a similar application. A substantial limitation to this concept, however, is access to interproximal surfaces known to be at high risk for root caries.

Laser Treatment

Argon laser irradiation of root surfaces resulted in significantly reduced in vitro initiation and progression of artificial caries compared to the controls.¹³¹ The effect was significantly enhanced with the addition of acidulated phosphate fluoride. Pioneering concepts such as laser applications promise an interesting future in preventive care for older adults.

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LONG-TERM CARE

In long-term care facilities, nurses and nursing aides provide the majority of care for residents including oral hygiene. Such care is usually delegated to nursing aides, who are often busy, are poorly compensated, and have a high rate of turnover. More than a quarter of aides report having no oral health component or no memory of one in their CNA training, and more than half had not attended a dental in-service in a year.²⁴ Dentistry has intuitively understood that experience and attitudes about personal oral hygiene affect the quality of oral hygiene care delivered to residents. Even among nurses, patient assessments of oral status were more accurate in those nurses who personally saw a dentist regularly.¹⁴

Directors of nursing at intermediate-care facilities in response to a survey provided reasons for lack of adequate oral hygiene care.⁶² The most frequent reasons were (1) residents who would not cooperate, (2) oral hygiene not perceived by aides as a high priority or as part of routine care, and (3) inadequate time and personnel. Reasons reported by aides for possible inadequacy of oral care included (1) inadequate time and staff, (2) behavioral and physical difficulties with residents, and (3) disliking oral care.⁷⁴ Not surprisingly, the least time was spent on oral care by the aides who disliked it the most, those who reported time and staff constraints, and those who regarded it as least important.

A surprising 98% of nurses' aides reported providing a substantial number of oral hygiene services to residents⁵⁰ but with no quantification of time or efficacy. In a selective review, Gordon and McLain⁴⁶ cite several studies that show poor oral hygiene and substantial treatment needs in institutionalized patients, and these findings are supported by other studies.⁶⁸

Oral hygiene programs aimed at educating long-term care staff to perform oral hygiene effectively have been generally unsuccessful.¹¹⁴ A program that demonstrated improvement in hygiene status and decreased dental diseases included (1) a daily oral hygiene plan, (2) a designated oral hygiene aide, (3) appropriate training and availability of supplies and equipment, and (4) a dental hygienist providing direct and indirect supervision.⁷² The suggestion of a designated oral hygiene provider was seen as a useful idea by 75% of aides, but more than 50% were not interested in the job.⁷¹

The Minnesota Nursing Home Rules describe that state's protocol for oral hygiene care⁷² and provides a reasonable model (Table 4).

More than a quarter of facilities acknowledged that not all their residents received regular oral hygiene care.⁶² Although 89% reported providing oral hygiene as part of the patient's care plan, only 58% reported assessing oral hygiene capability. Resident-specific plans were clearly not developed. The comprehensive assessment mandated by federal law (MDS—Minimum Data Set, RAP—Resident Assessment Protocol) provides data on dental status from which the team members establish a plan for the individual and flags needed dental intervention. The assessment is completed by nursing staff on admission and at specified intervals. Concordance between assessments done by dentists and nurses was low, with only 50% agreement on the RAP Summary (proceed/further dental treatment needed).⁵ The accuracy and agreement was significantly increased after training. The inclusion of hands-on practice and the involvement of the advisory dentist were seen as important components in the change.⁶⁹

Dentists, nursing personnel, and family members were surveyed to rate the importance of goals for dental care in the severely demented patients. All agreed that safety and freedom from pain were prominent goals. Nursing personnel

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Table 4. PROVIDING DAILY ORAL CARE: MINNESOTA NURSING HOME RULES**4658.0720 Providing Daily Oral Care**

Subpart 1. *Daily oral care plan.* A nursing home must establish a daily oral care plan for each resident consistent with the results of the comprehensive resident assessment

- A. A resident's daily oral care plan must indicate whether or not the resident has natural teeth or wears removable dentures or partials. It must also indicate whether the resident is able to maintain oral hygiene independently, needs supervision, or is dependent on others
- B. A nursing home must provide a resident with supplies and assistance necessary to carry out the resident's daily oral care plan. The supplies must include at a minimum: toothbrushes, fluoride toothpaste, mouthrinses, dental floss, denture cups, denture brushes, denture cleaning products, and denture adhesive products
- C. A nursing home must make the daily oral care plan available to the attending dentist before each checkup and must modify the plan according to the dentist's, dental hygienist's, or other dental practitioner's directions

Subpart 2. *Labeling dentures.* A nursing home must label full and partial dentures with the resident's name or other identifiers within 7 days of admission

From Helgeson MJ, Smith BJ: Dental care in nursing homes: Guidelines for mobile and on-site care. Spec Care Dent 16:153, 1996; with permission.

ranked chewing and enjoying of food higher than dentists. Family members focused, additionally, on fresh breath and normal speech and appearance. Effective oral hygiene maintenance has the benefit of contributing to all identified goals.

SUMMARY

A thorough assessment of function and development of a risk profile for dental diseases begins the process of planning a program customized to individual needs. Dentate older adults provide mechanical plaque removal with a toothbrush and interproximal cleaner selected or adapted to meet any special needs. Fluoride is a standard preventive agent to be included routinely in preventive plans with selection of concentration based on caries risk. Other preventive agents such as chlorhexidine rinses and xylitol gum are added to the plan as risk factors increase or when health and disability limit the ability to perform oral hygiene procedures effectively. Oral cancer screening examination is advocated on a regular basis for all older persons.

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Address reprint requests to

Lea Erickson, DDS, MSPH
Dental Service (160)
VA Medical Center
500 Foothill
Salt Lake City, UT 84148

Prevention in practice: results of a 2-year follow-up of routine health promotion interventions in general practice

AC Dowell, JJ Ochera*, SR Hilton*, JM Bland*, T Harris*, DR Jones** and S Katbamna

Dowell AC, Ochera JJ, Hilton SR, Bland JM, Harris T, Jones DR and Katbamna S. Prevention in practice: results of 2-year follow-up of routine health promotion interventions in general practice. *Family Practice* 1996; 13: 357-362.

Background. The effectiveness of health promotion activity in general practice on risk factor reduction for coronary heart disease remains the subject of active debate.

Objective. The study aimed to assess the impact of practice-based health check-ups on health behaviours over a 2-year period.

Method. A general practice cohort of 7123 patients from 18 practices was surveyed. Eight hundred and forty (12%) patients had been offered a health check within a 12-month period from September 1992 and 621 (9%) received one. Two hundred and fifty patients (40%) were asked back for follow-up after their health check.

Results. Over a 2-year period there was no difference in smoking cessation, alcohol consumption, weight loss nor the amount of exercise taken between those who attended for a health check and those who did not. The food score chosen to assess dietary change (Oxcheck) showed a statistically significant 1.16-point rise for the whole sample over the survey period. There was a significant difference in mean food score change between health check attenders and non-attenders (Mann-Whitney U test: $P < 0.002$). Maintenance of dietary improvement over a 2-year period was not affected by health check attendance.

Conclusions. This study confirms the low impact of health checks on the self reported modification of cardiovascular risk factors and shows that maintenance of appropriate health behaviour change is no more likely in those who have received a health check.

Keywords. Health promotion, general practice.

Introduction

A number of research studies have highlighted the modest changes in cardiovascular risk factors achieved by a variety of interventions in general practice settings in England and abroad.¹⁻⁶ The OXCHECK and Family Heart Study randomized controlled trials identified a 12% reduction in attributable risk as a result of standardized and intensive nurse interventions with the greatest effects in patient behaviour being in dietary modification, increased exercise and reduction in serum cholesterol. Neither study showed a marked change in smoking behaviour. We have previously reported baseline findings from a large cohort study in general

practice investigating the effectiveness of health checks in changing behaviour.^{3,7} The characteristic features of this study which commenced in 1990 are the focus on patient-reported behaviour change and its 'routine' general practice setting rather than the more intensive and standardized interventions of other studies. The design, methods and initial findings have been reported in detail elsewhere.⁷ We report further results from this cohort of patients. The main aims of this phase of the study were to assess the continuing impact of health checks on practice workload and on patients' health-related behaviour, and whether reported behaviour change is maintained.

Method

The cohort of patients was drawn from 18 group general practices, nine situated in the Wakefield district of Yorkshire Region and nine in the Merton and Sutton

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Centre for Research in Primary Care, University of Leeds, 30/32 Hyde Terrace, Leeds LS2 9LN, *Department of General Practice and Public Health Sciences, St Hospital Medical School, London and **Department of Epidemiology and Public Health, University of Leicester, Leicester, (UK).

district of South West Thames Region. Practices in the three family health services authority areas were invited to participate in the study. A cross-section was chosen from those who replied on the basis of general practitioner GP: list size ratio, GP: practice nurse ratio, and local social class and ethnic composition. The geographical and social settings represented in the sample span the national picture with the exception of under-representation of patients from ethnic minorities. All of the practices operated a call-up system for health checks, which were performed predominantly by practice nurses.

In each practice the original sampling frame consisted of 100 patients who had attended for a practice-based health check in the preceding 12 months selected from the practice records and a further 500 patients selected randomly from the practice age-sex register.

The sample size and composition reflected the need to have a sufficiently large 'health check' sample to allow initial comparison and a sufficiently large control group to perform continuing analysis as new patients were offered health checks.

Between September 1991 and February 1992, 10 600 patients aged between 28 and 67 years were sent self-completion questionnaires about aspects of their health-related behaviours and their attendance at health check clinics (Survey One). A second questionnaire was sent to the 7123 respondents of the first questionnaire between September 1992 and February 1993 (Survey Two).

The follow-up questionnaire (Survey Two) enquired about changes in health-related behaviour in the preceding 12 months and the content of any health check attended during that time. The follow-up questionnaire was sent out prior to the introduction of the present health promotion banding scheme in June 1993.

Subjects were asked detailed questions about changes in smoking habits, alcohol consumption, exercise, diet and weight, and the relationship of any changes to attendance at a practice-based health check. Dietary change was assessed by means of a previously developed and validated food frequency chart.¹ A composite 'food score' is produced from the fibre, saturated fat and sugar content of the patient's diet. Low scores indicate a diet which has high saturated fat and sugar content, and a low fibre content; a high score indicates one which has a high fibre and low fat and sugar content. The possible range of scores is from -25 to +28.

A check-up was defined in the questionnaire as a "full health check to help prevent stroke and heart disease (Human MOT)".

Reported changes in behaviour were calculated for the period between Survey Two and Survey One. Maintenance of changes in health behaviour were evaluated over a 2-year period from the baseline data collected at the time of the first survey.

Results

Response rate and attendance rate

Of 7123 patients who were sent a questionnaire in the second survey, 280 had moved or died in the previous 12 months and there were 1219 non-responders. This gave a usable response of 5624 (82%) questionnaires. The plan of the study and response rates are shown in Figure 1.

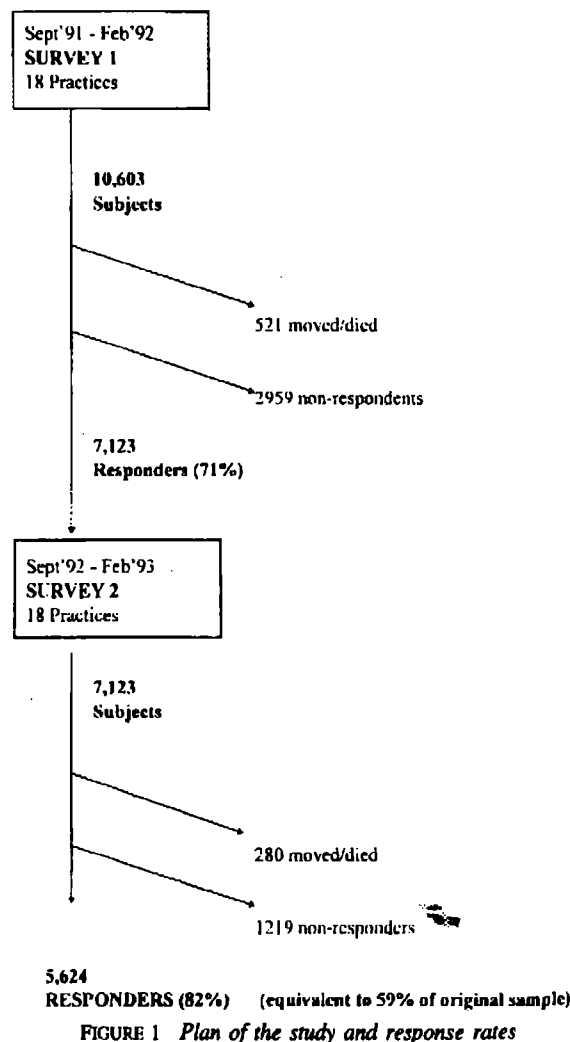


FIGURE 1 Plan of the study and response rates

There was a reduction in the number of patients receiving a health check throughout the duration of the survey. At the first survey, 1712 (24%) respondents had received a health check in the previous 12 months. Only 842 (15%) of the respondents to the second survey had been offered a health check in the previous 12 months and only 621 (11%) had received one.

Of the 5624 patients in the second survey, 3937 (70%) had had no health check, 1066 (19%) had attended for a health check before the first survey, a further 350 (6%) had had a health check between Surveys One and Two and 271 (5%) had received health checks in each year.

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TABLE 1 *Changes in health behaviour of whole sample and relationship to attendance at health check*

Behaviour change between Survey One and Survey Two	No health check <i>n</i> = 3937 No. (%)	Health check in year 1 <i>n</i> = 1066 No. (%)	Health check in year 2 only <i>n</i> = 350 No. (%)	Health checks in years 1 and 2 <i>n</i> = 271 No. (%)	Chi-squared test <i>P</i>
Stopped smoking	140 (3.6)	39 (3.7)	19 (5.4)	13 (4.8)	0.2
Reduced/stopped alcohol	492 (12.5)	116 (10.9)	36 (10.3)	34 (12.5)	0.1
Increased vigorous exercise	596 (15.1)	141 (13.2)	53 (15.1)	41 (15.1)	0.5
Lost weight: 7lb or more	432 (11.0)	106 (10.0)	48 (14.0)	48 (17.7)	0.01
Increased food score	2022 (51.8)	533 (50.6)	200 (57.8)	153 (56.5)	0.2

Impact on general practice workload

From Survey One, of 1333 patients attending for a health check, 554 (42%) were asked back for a follow-up. Of 621 patients attending a health check from Survey Two, 252 (41%) were asked back for follow-up. The most common reasons for follow-up were blood pressure check, cholesterol measurement and for discussion of test results.

Calculated changes in reported health-related behaviour between Survey One and Survey Two

A summary of the changes in health-related behaviour and the relationship to health checks are given in Table 1. The results given in this section are for the 5624 respondents to both surveys.

Smoking

At Survey Two, 1345 (24%) respondents said that they smoked regularly. Two hundred and eleven (4%) had stopped smoking since the first survey and 108 (2%) had started smoking. Of the 192 respondents who reported that they had recently stopped smoking in Survey One, 45 (23%) had started again by Survey Two.

Those who had attended a health check were no more likely to have stopped than those who had not.

Alcohol consumption

At Survey Two, 4549 (81%) respondents drank alcohol and 775 (14%) reported drinking over the recommended weekly limit in the week before they were surveyed.

At Survey One, 696 (10%) respondents had reported drinking over the weekly recommended limit in the previous week. Of these 231 (33%) reported drinking less than the weekly recommended limit at Survey Two.

Of the 4298 patients at Survey One who had been drinking below limits 290 (7%) reported drinking over limits at Survey Two.

There was no relationship between attendance at a health check and changes in patterns of alcohol con-

sumption. Only 90 (1.6%) respondents reported that they had been definitely or somewhat influenced to make changes by a health check.

Exercise

At Survey Two 4211 (75%) of the respondents had not taken any vigorous exercise in the previous 2 weeks and 2613 (47%) had not taken any exercise at all. Three thousand one hundred and forty-seven (56%) thought that they did not take enough exercise. Four hundred and thirty-five (8%) had taken vigorous exercise at least twice a week in the previous 2 weeks.

Eight hundred and thirty-one (15%) recorded taking more vigorous exercise than in the previous year and 797 (14%) recorded less. Two hundred and eight (47%) respondents who were taking vigorous exercise more than twice a week in Survey One were still exercising regularly in Survey Two.

Respondents who had had a health check in Survey One were less likely to have increased the amount of vigorous exercise they took by Survey Two than other respondents. Eighty-one (1.4%) respondents said that they had been definitely or somewhat influenced to make changes in the amount of exercise they took by a health check.

Diet

The mean food score for Survey Two was 1.16 points higher than for Survey One. The range of scores at Survey Two was from -20 to +27 with an interquartile range of +4 to +16. Amongst respondents 2908 (52%) recorded a higher score than they had in the previous year and 2091 (37%) recorded a lower score. The food score remained the same in 140 patients.

There were no significant differences in food scores for respondents who reported a health check and those not reporting one. Only 241 (4%) of the respondents thought that they had been definitely or somewhat influenced to change their diet by a health check.

TABLE 2 Maintenance of improved dietary change over 2-year period

Health check status	Had decreased food score in year 2 No. (%)	Had maintained or improved food score in year 2 No. (%)	Total: had improved diet in year 1
Had a health check in year 1	251 (40)	383 (60)	634
Never had a health check	868 (61)	560 (39)	1428
Total	1119	943	2062

Crude risk ratio = 1.01 (0.9–1.13).

Body Mass Index (BMI)

According to self-reported weight and height, 341 (6%) of the respondents to Survey Two were underweight (BMI < 20.0 kg m²). Two thousand seven hundred and fifty (49%) were of normal weight (BMI 20–24 kg m²), 1868 (33%) were overweight (BMI 25–29 kg m²) and 518 (9%) were obese (BMI > 29 kg m²). The data needed to calculate the BMI were missing for 147 respondents.

One hundred and twenty-five (32%) of the 394 overweight and obese respondents who had recently lost weight at Survey One, had gained over 7 lb by Survey Two. Four hundred and twenty-one (19%) of the 2257 respondents who were overweight or obese at Survey One, had lost over 7 lb by Survey Two. However, 458 (20%) had gained over 7 lb and 1326 (59%) had made no major change. Data were missing for 52 respondents.

There was no significant difference in the mean weight change of overweight and obese respondents between those who had and those who had not had a health check (Table 2). One hundred and fifty-six respondents (3%) said that they had been definitely or somewhat influenced to lose weight by health check.

Effects of health check attendance on changes made by patients with risk behaviours

Analysis compared the effects of health check attendance on those subgroups of patients with a particular risk behaviour. Patients who reported a health check between Survey One and Survey Two were compared with those who reported no check at all. The remaining 1337 patients who reported a health check in the year before the first survey were excluded from this part of the analysis. The results of this analysis are presented in Tables 3–6.

For changes in smoking, alcohol consumption and exercise, we restricted our attention to respondents who reported smoking daily, consuming more than recommended levels of alcohol (higher than 14 units/week

TABLE 3 Association between calculated smoking change and attendance at a health check in the last 12 months

Health check status	Did not stop smoking No. (%)	Stopped smoking No. (%)	Total
Health check in year 2 only	74 (80)	19 (20%)	93
No health check	870 (86)	140 (14)	1010
Total	944	159	1103

Crude risk ratio = 0.92 (0.83–1.03).

This table shows smoking cessation for patients who smoked at least once a day at Survey One.

TABLE 4 Association between reducing alcohol consumption and attendance at a health check in the last 12 months

Health check status	Did not reduce alcohol consumption below limits No. (%)	Reduced alcohol consumption below limits No. (%)	Total
Health check in year 2 only	36 (73)	13 (27)	49
No health check	364 (63)	212 (37)	576
Total	400	225	625

Crude risk ratio = 1.16 (0.97–1.39).

This table shows reduction in alcohol consumption for patients who drank over recommended limits at in the week before Survey One.

TABLE 5 Association between increase in exercise and attendance at a health check in the last 12 months

Health check status	Did not increase vigorous exercise No. (%)	Increased vigorous exercise No. (%)	Total
Health check in year 2 only	274 (85)	50 (15)	324
Did not have a health check	3126 (85)	555 (15)	3681
Total	3400	605	4005

Crude risk ratio = 1.00 (0.95–1.05).

This table shows increase in vigorous exercise for patients who had taken vigorous exercise less than three times per week in the 2 weeks before Survey One.

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TABLE 6 Association between median weight change and mean change in food score and attendance at a health check

Health check status	Median weight change	Interquartile range	Mean change in food score	Standard deviation
Health check in year 2 only	0	-5 to +6	+2.16	5.46
Did not have a health check	0	-4 to +5	+1.10	6.40

This table shows median change in weight of patients who were overweight or obese at Survey One and mean change in food score for all patients in the relevant categories.

Mann-Whitney U test (weight change): $P = 0.4235$.

Mann-Whitney U test (change in food score): $P = 0.0019$.

for women and over 21 units/week for men) and taking vigorous exercise less than three times per week at Survey One. The crude risk ratios represent the risk of a patient continuing the behaviour if they reported a health check divided by the risk of continuing the behaviour if they had not.

Health check recipients were slightly more likely to give up smoking and slightly less likely to reduce alcohol consumption but these differences were not significant. There were no differences in changes in exercise.

Weight changes had a non-normal distribution with a few very large decreases and a few large increases. These were analysed using non-parametric tests (Mann-Whitney U). The median weight change was zero in each group. Both groups showed an increase in mean food score. The group of patients who reported a health check had a mean change which was over a point higher and the difference between the two means was statistically significant.

Maintenance of behaviour change over 2-year period
Health check attendance was analysed with regard to maintenance of improvements in risk factor behaviour (Tables 6 and 7).

Diet

Of 2204 patients who had improved their dietary score prior to the first survey there was no difference between those who attended a health check in year 1 and those who never had a health check in terms of maintenance of improvements over a 2-year period (relative risk = 1.01; confidence interval = 0.9-1.13).

Smoking

Of 193 patients who stopped smoking prior to Survey One, there was no difference in maintenance of smoking cessation between those who attended a health check in year 1 and those who never had a health check (relative risk = 1.32; confidence interval = 0.77-2.26).

TABLE 7 Maintenance of smoking cessation over a 2-year period

Health check status	Had started smoking again in year 2 No. (%)	Were still not smoking in year 2 No. (%)	Total: had recently stopped smoking in year 1
Had a health check in year 1	14 (29)	35 (71)	49
Never had a health check	29 (22)	104 (78)	133
Total	43	139	182

Crude risk ratio = 1.31 (0.76-2.27).

As for diet and smoking, no difference was demonstrated for maintenance of any other risk factor.

Discussion

This study provides further data to inform the debate about the effectiveness of general practice-based health promotion. Several surveys¹⁻³ have concluded that health promotion activities carried out in 'health checks' by practice nurses have limited impact on behaviour change. The OXCHECK and Family Heart Studies incorporated intensive and expensive nurse interventions. Our own previously reported studies suggested that equivalent results are achieved with less intensive interventions offered routinely as part of the previous health promotion clinic system.

General practice-based health promotion may have contributed to the climate of awareness producing any overall improvements in healthy behaviour although this effect has been difficult to prove.

This study which compared changes in reported health behaviour in a cohort of 5624 general practice patients demonstrated a mixed pattern of changes in the measured health behaviours between the two surveys. Although smoking rates had decreased and the overall mean food score had increased, reported BMI had increased, as well as the number of patients drinking over the recommended alcohol limits.

Attendance at a health check did not lead to significant improvements in behaviour change. Patients attending a health check were more likely to lose weight than those who did not (Table 1), but analysis of weight change in overweight patients shows no difference between attenders and non-attenders. The only exception was that patients who had attended a check were more likely to have an improved food score.

An important point highlighted by our study is that changes in cardiovascular risk factor behaviour may be erratic and positive changes are subject to reversal.⁴ A quarter of all those who had given up smoking at the time of the first survey had started again at the time

of the second, and 37% had started drinking again after stopping.

The ability to maintain appropriate changes over a 2-year period was not enhanced by attendance at a health check. This is disappointing, since even though it is known that interventions might have a low initial impact there was the possibility that any changes that did occur were more likely to be sustained.

These results describe the impact reported by patients of 2 years of health promotion activity in a cross-section of general practices. We believe that the results are representative of general practice as a whole and are complementary to the findings of the OXCHECK and Family Heart Studies. Health promotion check-ups have a low initial impact on cardiovascular risk reduction and participation in current health promotion efforts appears to offer no benefit in sustaining positive behaviour changes. This is in contrast to health promotion directed at those with known cardiovascular disease where health education has been shown to increase exercise and improve dietary habits in those with angina.⁹

There is currently much interest in the application of various models of behaviour change to health promotion¹⁰ and also the need to target high risk groups.¹¹ Further studies are required to examine underlying reasons for success or failure of adopting healthy behaviours in individual patients.¹²

Compared with the findings of our first survey a year earlier, the rate at which health checks were being performed was reported as much reduced, even though this was prior to the announcement of the change to the health promotion banding system. Our surveys also showed that more than 40% of patients required at least one follow-up attendance following their health check. The introduction of the 'health check' systems was received with caution and some scepticism by general practice and subsequent health promotion policy changes have proved unpopular.¹³ The findings from this survey set in the context of increasing general practice workload indicate that any further changes must be carefully considered if they are to be received positively.

Acknowledgements

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Effects of a Health Promotion Program on Sustaining Health Behaviors in Older Adults

Patrick J. Fox, PhD
Wendy Breuer, RN, MPH
Janice A. Wright, RN, MS

Background: Controversy exists regarding the optimal way to provide health promotion education to the elderly. This prospective randomized study evaluated the effectiveness of individualized assessment and counseling coupled with the receipt of a written health plan on client adherence to health behavior recommendations.

Methods: Two hundred thirty-seven ethnically diverse and predominantly low-income adults 60 and older, participating for the first time in an established statewide public health prevention program delivered in both rural and urban clinics, were recruited and randomly assigned to treatment and control groups. All participants received a standardized assessment that included a health history, nutrition assessment, and limited physical exam from a public health nurse. The treatment group additionally received a written personal health plan and individualized counseling to support implementation of the plan. Both groups were interviewed after one year to determine their adherence to the original recommendations.

Results: Seventeen preventive services and health behaviors were evaluated. There were no statistically significant differences between the groups on health care use and previous health behaviors at baseline. Using logistic regression and controlling for socioeconomic and demographic variables, we found that the treatment group that received a personal health plan and counseling completed significantly more preventive referrals and health behavior changes ($P < .001$).

Conclusions: A client-centered planning process with supportive counseling by public health nurses, combined with health plans provided to clients, can significantly increase the prevention measures taken by older adults.

Medical Subject Headings (MeSH): health promotion, elderly, compliance, health behavior, low-income population. [Am J Prev Med 1997;13:257-64]

Although the benefits of health promotion efforts are well-documented among nonelderly populations,¹⁻²⁴ less research has focused on older adults.²⁵⁻³⁷ Further, little research has been conducted on the structure and content of health promotion efforts designed for older adults.³⁸ The overall goal of health promotion in elderly people is preventing or slowing the rate of disease progression and reducing the risks of disability and death, but people may not have a clear idea about preventive actions to improve their health.³⁹

Compliance with a health promotion plan generally implies a relatively passive role for the client that places the responsibility

on him or her for following a physician-prescribed regimen.

Unlike compliance, adherence suggests a more equitable role for the client in cooperatively setting health promotion goals with health care professionals. The participatory aspect of the adherence model is thought to be more effective if the goal is to maintain complex behavior changes over long periods of time.⁴⁰

The two major objectives of patient education and counseling related to primary prevention are changing health behaviors and improving health status.⁴¹ Elderly people in general may be more motivated than members of other age groups to adopt health behavior changes because of their firsthand experience, as well as the experience of their peers, in coping with chronic diseases.⁴² Within older age groups, relatively high users of health care services tend to be more amenable to participation in health promotion programs.⁴⁰ The success of a health promotion program for an older individual is related not so much to the information conveyed about activities that promote health, but rather how that information is communicated and how specific actions are targeted.⁴²

From the Institute for Health & Aging, School of Nursing, University of California, San Francisco, California.

Address requests to Dr. Fox, Institute for Health & Aging, School of Nursing, University of California San Francisco, San Francisco, CA 94143-0646 (e-mail: pf1965@itsa.ucsf.edu).

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Older people may have greater receptivity to health promotion efforts that they perceive are targeted to their specific situation or that they believe are under their control.^{38,39,41} To improve adherence to health plans, research also suggests that time should be spent with older clients determining how to effect a desired change. The complexities of a long-term behavior change should be broken down into easily managed components.⁴³ Creation of simple short-term goals and targeting of behaviors the older person is more willing to change have also been found to facilitate behavior change.^{38,44} Written instructions, such as health promotion activity plans or cards, that act as a reminder to engage in a specific behavior also significantly increase adherence to recommendations.^{41,46} Individualized assessment and counseling with older clients enrolled in an HMO, coupled with a written plan given to them, have been shown to significantly improve adherence to health promoting behaviors.⁴²

In this study, both of these components are provided for the treatment group in community-based public health department clinics targeted to low-income older adults. The prospective randomized study reported herein was designed to evaluate the effectiveness of individualized assessment and counseling for the cooperative development of health plans, and receipt of a written health plan, on client adherence to health behavior recommendations provided to new enrollees at sites in four California counties.

We examine one-year differences in health plan adherence among two groups of older adults. The treatment group received individualized health assessment, identification of health risks, extensive counseling and interaction to cooperatively develop a health plan, and a written health plan specifying goals, objectives, and time frames for accomplishment. The control group received only the health assessment, risk identification, and limited verbal health plan counseling, but no written health plan.

METHODS

The Preventive Health Care for the Aging (PHCA) program in California is a public health prevention program funded over a 20-year period by the state of California through the Department of Health Services (DHS). During the year the study was conducted (1994-1995), the DHS contracted with 22 city/county health jurisdictions employing public health nurses (PHNs) who provided comprehensive health assessments to 11,000 adults 60 years of age and older. Minority and low-income people are targeted through clinic site placement and outreach. Services are provided in community settings such as senior centers, nutrition sites, senior housing facilities, and churches. Diverse geographic areas are served from small rural communities to inner-city areas. A three-day training conference for all PHNs providing services in the program is held annually to provide current information on assessment practices and health promotion, disease prevention, and management of chronic diseases.

Site selection. The sites participating in this study were chosen to include geographically diverse (rural, urban, suburban) areas whose PHNs were experienced in delivering assessment and counseling services. To aid in site selection, a review of prior years' program data was conducted. This review indicated levels of performance at the study sites (based on health problems identified, referrals made, and counseling provided) consistent with

the majority of sites statewide. The sites from which clients were enrolled were located in four counties, two of which are predominantly rural with some concentration of population and services in larger towns (one in the western Sierra foothills and one in the Central Valley) and two of which are predominantly urban/suburban with some rural coverage (one in eastern southern California and one in the coastal region of southern California).

The intervention. The PHCA Comprehensive Health Assessment (CHA) is a standard service unit used by all PHNs. It consists of standardized data collection forms and includes a health history, nutrition assessment, and a limited physical exam (height, weight, blood pressure, pulse, vision and hearing screenings, oral/dental screening, visual inspection of sun-exposed skin areas, and foot exam).

The health history includes self-reported data including demographic information, usual health care providers, family health history, current diagnoses and treatments, hospitalizations, last time preventive exams/services were obtained, recent experience of symptoms, ability to perform ADL/IADLs, health habits (e.g., exercise, smoking, alcohol consumption, seat-belt use), recent falls or other injuries, prescribed and over-the-counter medication use, vitamin and mineral supplement use, and depression or other mental health problems. The nutrition assessment includes a food and fluid diary for a typical day with a comparison of nutrition intake to a standardized recommendation based on the USDA Food Pyramid and the "Food Guide for Mature Adults" developed by a state nutrition consultant.

As part of standard PHCA care, PHNs work collaboratively with clients to determine which health behaviors they are most willing and able to modify. This activity forms the basis for the development of a mutually approved health plan. Both recommendations and referrals for preventive services are based on a dyadic relationship where the PHN takes into account the information derived from her assessment, the client's risk status, and the client's willingness to modify his or her behavior.

Counseling by the PHNs is specific to the health risks identified and referrals needed and includes medical and community provider referrals to obtain services or additional information. PHNs record the amount of time spent (if greater than 10 minutes on one topic) counseling clients about various health topics as well as the category of topic covered. Referrals to health professionals outside the PHCA program (e.g., physicians, dentists, podiatrists) may be recommended. Both counseling and referral activities are coded in a statewide data system. Referrals are recorded on a standardized visit encounter form and PHNs follow up with clients by phone within three months for all referrals to physicians and dentists unless the referral was declined.

Clients enrolled in the study were given, at the PHN's discretion, a health screening results form that included basic assessment information such as blood pressure and weight as well as listing the medical referrals made by the PHN. PHCA providers use a variety of health promotion pamphlets and handouts to augment counseling.

Data collection. PHNs were trained in obtaining informed consent, collecting data, and implementing different interventions for the treatment and control groups. PHNs were instructed to respond to any questions participants asked, regardless of group, and to counsel and refer any client with a potential medical problem needing evaluation by a physician, regardless of group assignment.

During the client enrollment period (3/10/94 to 9/3/94), parti-

cipants were randomly assigned into treatment and control groups. After the completion of the CHA, the control group received verbal recommendations for health behavior changes while the treatment group received verbal recommendations, individualized counseling, and a written health plan detailing methods and time frames set cooperatively with the client to accomplish behavioral recommendations.

PHNs kept a written record (not given to the client) of the verbal recommendations made to control group members as a result of their standard assessment. These records were used to compare one-year adherence to (verbalized) health behavior recommendations by the control group with adherence by the treatment group whose baseline written health plan (which was provided to the client) was also reviewed after one year. All information on adherence to health behavior recommendations and barriers affecting adherence was obtained by client self-report.

Five different data-collection instruments were used in this study. A standardized encounter form was used to obtain client and site identification numbers, date of visit, sociodemographic variables (i.e., date of birth, gender, race/ethnicity, living arrangement, marital status, health insurance coverage, and annual income), areas of extensive counseling, and types and reasons for referrals to health professionals.

A standardized referral follow-up form was used to track and document referral outcomes three months after the original referrals. A standardized health history form was used to provide additional self-reported demographic information (i.e., occupation) and health history data (i.e., number of chronic illnesses, self-rated health status, energy compared to last year, ADL/IADL problems, number of new problems or diagnoses in past year, changes in family situation, depression, hospitalizations, last physician visit, last dental visit, last stool test for occult blood, last rectal exam, last Pap test, last prostate exam, last mammogram, seat-belt use, cigarette smoking, alcohol/drug problems, and hours of exercise per week).

A standardized return client history form was used 12 months later to obtain information since the baseline assessment. Variables include new hospitalizations, accidents, surgeries, diagnoses, self-rated health status, review of systems (i.e., vision, hearing, oral/dental, skin, respiratory, cardiovascular, musculoskeletal, gastrointestinal, endocrine, genito/urinary, neurologic, and gynecologic/breast examination), and health-related behaviors and functional limitations (i.e., changes in family situation, depression, insomnia, sexual problems, exercise, energy level, seat-belt use, smoking, alcohol and caffeine consumption, ADL/IADL limitations, and changes in health behaviors).

Two standardized health plan forms were used to document health plan recommendations and adherence. The baseline health plan form documents the PHN/client-approved baseline actions and time frames for completion (e.g., obtain mammogram within three months, increase brisk walking from one half hour two times per week to one half hour four times per week for 12 months, increase water from three to five glasses per day for 12 months, decrease coffee from six to three cups per day for 12 months). The client adherence form, used 12 months later, documents client adherence to the original recommendations (i.e., original recommended action, description of action implemented by client, duration of action, and barriers to adherence to the recommended action).

Health behavior adherence measures. Adherence to client health plans was measured along two dimensions: (1) whether

the client totally or partially completed the recommended action and (2) whether the client's action occurred within the agreed time frame. This information is based on the client's self-report. Medical and dental referrals are followed up by the PHN within three months of the referral by calling the client. Periodically, physicians call the PHNs to confirm that a recommended client visit was completed. But the primary source of both health referral and health behavior modification actions is client self-report. Although self-report data may be subject to bias, the randomized design of the study contributes greatly to mitigating the possibility of differential bias across the treatment and control groups.

At the time clients came in for their annual revisit, PHNs reviewed with them the health recommendations made the previous year. For the treatment group, the written plan was reviewed. For the controls, the PHN reviewed the verbal recommendations that had been documented but not given to them. If the client indicated that he or she was not able to follow through completely with a recommendation, he or she was also asked to identify adherence barriers. The follow-up assessment information was then rated by the study director. Both action and time parameters were scored on a scale from 1 to 3 with 1 indicating total adherence, 2 partial adherence, and 3 nonadherence. The Client Composite Score (CCS) was then calculated by summing action and time scores and dividing them by the number of health behavior recommendations for each client. The CCS ranges from 2 (completely adherent) to 6 (completely nonadherent). Clients who were not able to return to clinic were interviewed regarding their adherence over the phone by the study director.

The adherence measure was divided into three categories: (1) health behavior rating score equal to 2 indicating complete adherence in both action and time; (2) health behavior rating score of 3 or 4 indicating moderate adherence; and (3) health behavior rating score of 5 or 6 indicating nonadherence. The categorization of scores in this way allows clients who adhered partially to the recommendation along either the action or time dimensions to be coded as moderately adherent. If a client was completely nonadherent in the action dimension, then he or she was automatically classified as nonadherent in the time dimension, but not vice versa. In the prior instance, the time dimension is irrelevant due to no effort on the action dimension. In scoring the adherence dimensions, account was taken of client barriers to adherence. For example, if an exercise recommendation was not followed because the person required hip replacement surgery, then the health behavior was eliminated from the CCS.

Analysis. All data analysis was conducted using a personal computer with a Pentium processor. Statistical Analysis System (SAS) software, Version 6, was used to compute chi-square, *t* test, and logistic regression analyses.

Chi-square tests (PROC FREQ) were computed to examine participant/refuser demographic differences and treatment/control group differences in demographics, health history, health care use, health promotion behaviors, counseling topics, number of health referrals, number of accepted referrals, types of referrals, completion of referrals, phone contacts for referral follow-up, types of health behavior recommendations, barriers to health behavior adherence, and treatment/control group distribution differences within CCS categories. *T* tests (PROC TTEST) were used to assess 12-month treatment/control group differences in both mean health behavior adherence CCS and the time and action components of the CCS. A logistic regression model

(PROC LOGISTIC) was constructed to identify independent variables predictive of greater compliance with health behavior recommendations.

RESULTS

Characteristics of study participants and nonparticipants. A total of 237 clients agreed to participate while 291 refused. No statistically significant differences were found between enrolled participants and those who refused to participate in terms of age, gender, marital status, income, race/ethnicity, or health insurance. The only significant difference was that enrolled participants were more likely to live alone than nonparticipants (46% versus 56%, respectively; $P < .05$).

Demographic and health history characteristics of the sample. To isolate any intervention effect, we compared demographic, health status, and health care use characteristics of the treatment and control groups to ascertain whether any significant differences might affect adherence outcomes. Of the 237 PHCA clients who agreed to participate in the evaluation project at baseline, 118 were randomly assigned to the treatment group and 119 to the control group. Reassessments were completed at one year on 109 treatment clients (92%) and 104 control clients (87%). Twenty-four clients from the original 237 enrollees were not reassessed either because they could not be located, refused to be reevaluated, or had died.

Table 1 displays the demographic characteristics of the treatment and control group members. For the 213 clients who were reevaluated, the respective groups showed no statistically significant differences with the exception of age. The control group contained a significantly higher percentage of clients between the ages of 60–69 (56% versus 46%; $P < .05$).

There were also no significant differences between the groups in terms of baseline self-reported health status, number of reported chronic illnesses, difficulty with ADLs or IADLs, number of new health problems or diagnoses in the previous year, last physician visit, last dental visit, last stool test for occult blood, last Pap smear and mammogram for women and prostate exam for men, smoking, alcohol/drug use, hours of exercise per week, and percentage who wear a seat belt. The sample was relatively healthy with over 80% in both groups reporting needing no assistance with ADLs and IADLs and having no hospitalizations in the prior year. Overall, clients in both groups did not report substantial changes in their health status during the baseline to the one-year follow-up period.

Adherence to Health Behavior Recommendations

Table 2 shows the distribution of health behavior recommendations for the treatment and control groups. The only statistically significant difference between the groups was a higher percentage of the control group clients referred for colon cancer screening (5.8% versus 0.9%; $P < .05$). Recommendations were also classified into two groups: (1) recommendations that would require ongoing behavioral changes on the part of the client such as nutrition plans, weight control plans, use of sunscreen, exercise regimens and (2) preventive screening referrals such as Pap tests, mammograms, prostate exams, and immunizations. The former type of recommendation was felt to be more difficult to adhere to than the latter. A slightly higher percentage of the treatment group received recommendations requiring ongoing

Table 1. Demographic characteristics of the sample, by treatment and control groups

Characteristic	Treatment (n = 109)	Control (n = 104)
Attrition rate	7.6%	12.6%
County of enrollment		
County A	22.0	24.0
County B	11.0	13.4
County C	37.6	41.3
County D	29.3	21.1
Gender		
Male	24.8	35.6
Female	75.2	64.4
Income (missing = 10)		
<\$7,000	18.9	13.7
\$7,000–10,000	22.6	24.1
\$10,001–20,000	33.0	43.1
>\$20,000	23.6	15.7
Marital status (missing = 3)		
Married	33.9	53.8
Widowed	33.0	29.8
Divorced	24.5	9.6
Single	8.5	6.7
Age group (years)		
50–59	3.7	0.0
60–69	45.9	55.8*
70–79	37.6	27.9
80–89	12.8	12.5
≥90	0.0	3.8
Ethnicity		
Hispanic	8.3	13.4
African American	1.8	0.0
Caucasian	84.2	82.7
Filipino	4.6	3.8
Asian and other	1.8	0.0
Primary occupation (missing = 15)		
Executive, major professional	4.0	1.0
Manager, lesser professional	19.0	19.4
Administrative, small business	17.0	16.3
Clerical, sales	19.0	24.5
Skilled manual	8.0	7.1
Semi-skilled	14.0	9.2
Unskilled	3.0	3.0
Homemaker	16.0	19.4
Health insurance		
Medicare only	11.0	17.3
Medicare + Medi-Cal (Medicaid)	10.1	7.7
No insurance	12.8	12.5
HMO with or without Medicare	38.5	37.5
Other insurance with or without Medicare	18.5	19.2
Other	9.2	5.8

Source: California Department of Health Services, Preventive Health Care for the Aging Program Encounter and Health History Statistics, 1994.

* $P < .05$.

Table 2. Distribution of health-behavior recommendations, by treatment and control groups

Recommendation	Treatment (n = 109)	Control (n = 104)
Nutrition changes	43.1%	38.4%
Immunization referrals	30.3	32.7
Exercise plan	31.2	23.1
Mammogram referrals	17.4	15.4
Weight control plans	15.6	10.6
Fluid intake plans	14.7	13.4
Pap referrals	13.7	16.3
Vision referrals	11.9	10.6
Psychosocial referrals	10.1	6.7
Breast self-exam plans	9.2	3.8
Prostate screening referrals	6.4	6.7
Medication plan	5.5	3.8
Sunscreen plan	3.7	9.6
Dental care plans	3.7	8.6
Hemoccult completion	3.7	2.9
Smoking cessation plans	1.8	1.9
Colon cancer screening referrals	0.9	5.8*
Other plans	5.5	11.5

Source: IHA/UCSF Health Plan Adherence Data, 1994.

*P < .05.

changes while a slightly higher percentage of the control group received screening recommendations, but the differences were not statistically significant. The degree of difficulty in implementing recommendations does not seem to have been a factor in the observed treatment/control group adherence differences.

Table 3 shows that the mean number of health behavior recommendations per client did not differ significantly between the treatment and control groups. A mean composite score was calculated for each client based on the rating for each health behavior divided by the number of recommendations the client received. A test of the difference between the mean composite score for the treatment and control groups indicated that the treatment group had a significantly lower score (i.e., were more adherent; $P < .05$). When the rating is split into time and action components, the treatment group remains significantly more adherent, particularly in the time parameter.

Chi-square tests indicated that the percentage of clients distributed among these three categories was significantly different for the treatment and control groups ($P \leq .001$), with 32% of the treatment group in the completely adherent category versus 13 percent of the control group. For moderate adherence, 43% of the treatment and 48% of the control group fell into this category while 38% of control group members were not adherent versus 26% for the treatment group. Based on these descriptive tests, there was a significant association between the treatment intervention (i.e., extensive counseling and written health recommendations) versus the control intervention in terms of adherence to health plan recommendations over a one-year period.

We then examined the number of rated health behavior recommendations by adherence score. For recommendations for which the client received a rating of moderately adherent or nonadherent, we found few significant differences between the treatment and control groups. The treatment group had significantly more

Table 3. Client health-behavior recommendation (HBR) adherence, by treatment and control groups

Characteristic	Treatment (n = 109)	Control (n = 104)
Mean number of HBRs per client	2.8	2.4
Mean CCS* per client (missing = 2)	3.4	3.9**
Mean HBR action score per client	1.7	1.9**
Mean HBR time score per client	1.7	2.0**
Level of adherence (% of clients)		
Completely adherent (HBR = 2)	32.1	13.4
Moderately adherent (HBR = 3 or 4)	42.9	48.1
Nonadherent (HBR = 5 or 6)	25.7	38.4***

Source: IHA/UCSF Health Plan Adherence Data, 1994.

*Client Composite Score.

**P < .05.

***P < .001.

recommendations addressing weight control than did the control group. This is in keeping with our previously noted finding that the treatment group received slightly more recommendations that required ongoing action as opposed to preventive screening procedures. In the nonadherent category, there was a significant difference found for recommendations that advised the client to use sunscreen on a regular basis. The control group had a poorer response to this recommendation. However, there were more clients in the control group who received this recommendation. In general, we did not find a significant association between the recommendation topic and level of compliance. Again, the enhanced intervention seems to have been more important than the type of recommendation made to the client.

Forty-three of the re-evaluated clients were interviewed by the study director over the telephone (29% of the treatment group and 12% of the control group). In order to rule out the possibility of interviewer bias accounting for differences in level of adherence, we compared scoring results of the telephone clients with the clinic-return clients and found no significant differences in the distribution among the three levels of adherence.

Client-PHN Interactions: Referrals and Counseling Time

There were no significant differences in the number or intensity of counseling services received by the treatment or control groups. In addition, we found no significant differences in the type of topics covered in counseling, the number of referrals per client, the number of accepted medical referrals, the type of referral, or the completion of referral recommendations by clients. Further PHN contact with clients by phone for referral follow-up did not differ significantly between the treatment and control groups. Extra verbal or written information given to control group members at baseline also had no significant association with the level of adherence to the health behavior recommendations.

Barriers to Adherence

Barriers to adherence were classified into (1) economic, (2) psychosocial, (3) geographic/transportation, (4) physiological, (5) major medical/surgical problem, (6) nonmotivation or refusal that included forgetting, and (7) other. A significantly larger percentage of the control group reported having economic barriers to adherence (5% in the treatment group versus 13% for the

controls; $P < .05$). For individual health behavior ratings, the reported barriers to compliance for the moderately adherent and the non adherent were not found to be significantly different between the two groups.

With the enhanced intervention, PHN counseling included the identification of community resources where low-income participants could find access to needed and acceptable services or resources. This difference may account for the larger number of control group participants (who did not receive this information) reporting economic barriers.

Predictors of Adherence

A logistic regression model was developed to identify independent variables that were predictive of higher compliance with health behavior modification plans as indicated by mean CCSs. The independent variables hypothesized to be predictive of level of adherence were assignment to treatment or control group, income ($\leq \$10,000$ versus $> \$10,000$), gender, age, marital status (married versus not married), living arrangement (with others versus alone), health insurance (some versus none), county of site, changes in family situation (yes/no), depression (yes/no), self-perceived health status (excellent/good versus fair/poor), number of referrals, occupation (executive/manager/administrative versus clerical/skilled manual/semi-skilled/unskilled/homemaker), number of chronic conditions, number of hospitalizations, and number of ADL impairments. As shown in Table 4, assignment to the treatment group was most significantly predictive of higher adherence. The odds that participants who enrolled in the treatment group would adhere to recommendations were almost three times greater than for participants enrolled in the control group. Other significant predictors of adherence include the County B PHCA site, increasing age, and living with others.

DISCUSSION

The outcomes of this evaluation indicate that detailed, mutually approved client-specific health behavior recommendations to

improve health status that are both verbally communicated by PHNs, discussed with the clients, and provided to clients in the form of written health plans, are significantly and positively associated with client adherence to recommendations. The treatment and control groups did not differ significantly in terms of their socioeconomic or demographic characteristics, with the exception that the treatment group was slightly older than the control group. Literature on health promotion indicates that increasing age is associated with greater compliance.^{39,40} However, when age and other demographic variables are controlled for in the logistic regression model, having received the enhanced intervention remained predictive of greater adherence.

Overall, these results support other studies that have demonstrated the effectiveness of personalized and cooperative health promotion plan development between professionals and clients.^{26,32,33,39} Further, the results demonstrate that the use of tailored counseling methods and written health plans can be effectively delivered in community-based public health clinics to facilitate behavior change in a low-income elderly population.

The underlying assumption of this type of intervention is that changes in health behaviors will have a positive impact over time on a range of health outcomes for older adults. Future investigations will need to address the effect of client adherence to health behavior recommendations on morbidity and mortality, functional status, quality of life, the duration of behavior change, changes in use of primary health care services, extent to which older adults receive similar recommendations from primary care practitioners and managed care providers and level of adherence to their recommendations, and the effect of sustaining health behavior changes in PHCA clients returning for annual assessments versus those that do not return.

A weakness of the study is that we are unable to assess the effects of the counseling and written care plan components separately, and so are unable to determine whether the intensive counseling had a greater effect on adherence outcomes than the written care plan. Another limitation is the lack of information regarding site-specific or PHN characteristics that may have influenced client adherence behaviors. As a statewide public health promotion program, the PHCA has developed a model that heavily emphasizes outreach to older adults who are uninsured or underinsured, have language or geographic barriers to access of services, use medical services inappropriately or not at all, lack information about behaviors that increase health risks, and often require ongoing support to make recommended health behavior changes. To what extent this population represents the older adult population of California is unknown.

Although these types of interventions have been demonstrated to increase adherence to health promotion plans,⁴⁶ they require that a certain amount of time be spent with the client to ensure the development of a reasonable health plan that is perceived by the client as both within his or her ability to complete, as well as efficacious in improving health. The recommendations detailed in the U.S. Preventive Services Task Force (USPSTF) report emphasize that clinicians must assist patients in assuming greater responsibility for their own health by providing repeated counseling messages that may lead to improved personal health practices.⁴¹

Clinicians increasingly face incorporating these measures into a changing health care system currently oriented to reducing the number and length of patient visits as one cost-containment measure. At least for older adults, an unintended consequence of

Table 4. Predictors of adherence to health-behavior recommendations (HBRs), maximum likelihood estimates, conditional odds ratio, and 95% confidence limits

Independent variables*	OR	CI's
Treatment versus control group	2.94	1.61, 5.35***
County B versus County A	0.23	0.10, 0.53***
County B versus County D	0.20	0.08, 0.55***
Increasing age	1.36	1.00, 1.08**
Living with others versus alone	0.42	0.19, 0.97**

Source: California Department of Health Services, Preventive Health Care for the Aging Program Return Health History Statistics; IHA/UCSF Health Plan Adherence Data, 1994.

*Variables in model that were not significantly predictive of adherence: income, gender, marital status, health insurance, county = county C, changes in family situation, depression, self-perceived health status, number of referrals, occupation, number of chronic conditions, number of ADL impairments. The dependent variable is the mean Client Composite Score (CCS).

** $P < .05$.

*** $P \leq .001$.

such trends is that they may limit the effectiveness of health promotion efforts in achieving the goals of stimulating and sustaining health promoting lifestyle changes. It is a question as to whether the immediate efficiencies that may be achieved by decreasing the average time clinicians spend with clients, at least in the area of health promotion activities, are offset by a corresponding reduction in the probability that desired health promoting behavior changes will be sustained over time.

As the USPSTF report notes, any visit to a clinician represents an opportunity for providing preventive services. Community-based programs in both the private and public sectors can assist individual clinicians in reaching at-risk older adults and implementing risk-reduction behavior changes that the clinician reinforces at each patient visit and that may have long-range health benefits in reducing health care costs and retarding functional decline.

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