

Preventing and Controlling Oral and Pharyngeal Cancer

Recommendations from a National Strategic Planning Conference

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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Agencies and Organizations Represented by Conference Participants

Academy of General Dentistry
American Academy of Hospital Dentists
American Academy of Maxillofacial Prosthetics
American Association for Cancer Education, Inc.
American Association of Dental Research
American Association of Dental Schools
American Association of Public Health Dentistry
American Cancer Society
 California Division
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American Dental Association
American Dental Hygienists' Association
American Medical Association
American Medical Women's Association
American Public Health Association, Oral Health Section
American Student Dental Association
Arizona Department of Health Services, Office of Tobacco Control and Planning
Arkansas Cancer Research Center, College of Nursing
Association of Community Dental Programs
Association of State and Territorial Chronic Disease Directors
Association of State and Territorial Dental Directors
Association of State and Territorial Health Officials
Baylor University, Oral Oncology Program
Boston Department of Health and Hospitals, Community Dental Programs
Boston University School of Public Health
Bowman Gray School of Medicine
 Department of Family and Community Medicine
 Department of Otolaryngology
Centers for Disease Control and Prevention
 National Center for Chronic Disease Prevention and Health Promotion
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 Division of Cancer Prevention and Control
 Division of Oral Health
 Office on Smoking and Health
 Office of Minority Health
Council of State and Territorial Epidemiologists
Department of Veterans' Affairs, Office of Dentistry
Federation of Special Care Organizations, Academy of Hospital Dentists
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Howard University College of Dentistry, Department of Community Dentistry
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Kaiser Permanente/Permanente Dental Association
Loyola University, Dental General Practice Residency Program
Medical College of Virginia, Department of Oral Pathology
Memorial Sloan-Kettering Hospital, Dental Service
National Association of Alcoholism and Drug Abuse Counselors
National Association of County and City Health Officials
National Dental Association
National Institutes of Health
 National Cancer Institute
 National Institute of Dental Research
Ohio State University
Oral Health America
Oral Health Education Foundation
Smileage Dental Services, Inc.
Southwest Oncology Group
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Tata Institute of Fundamental Research (India)
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 San Francisco, School of Dentistry
University of Connecticut, School of Dental Medicine
University of Florida, School of Dentistry, Department of Community Dentistry
University of Georgia, Institute of Community and Area Development
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Preventing and Controlling Oral and Pharyngeal Cancer

Recommendations from a National Strategic Planning Conference

Summary

In August 1996, CDC convened a national conference to develop strategies for preventing and controlling oral and pharyngeal cancer in the United States. The conference, which was cosponsored by the National Institute of Dental Research of the National Institutes of Health and the American Dental Association, included 125 experts in oral and pharyngeal cancer prevention, treatment, and research; both the private and public sectors were represented. Participants at the conference developed recommendations concerning advocacy, collaboration, and coalition building; public health policy; public education; professional education and practice; and data collection, evaluation, and research.

A follow-up meeting consisting of selected participants of the 1996 conference was held in September 1997. During this meeting, changes that had occurred in the political and scientific arenas since the 1996 conference were considered, and 10 recommended strategies from the conference were selected for priority implementation. These 10 strategies were to a) establish a mechanism to implement and monitor the recommended strategies developed during the conference; b) urge oral health professionals to become more actively involved in community health; c) require instruction in preventing and controlling tobacco and alcohol use at all levels of training in dental, medical, nursing, and other related health-care disciplines; d) encourage Medicaid, Medicare, traditional insurance plans, and managed-care entities to consider making oral cancer examinations an integral part of comprehensive physical and oral examinations; e) designate federal funding for a national program of oral cancer prevention, early detection, and control; f) after assessing local needs, develop, implement, and evaluate statewide models to educate all relevant groups; g) develop and conduct a national promotional campaign to raise public awareness of oral cancer and its link to tobacco use and heavy alcohol consumption; h) develop health-care curricula that require competency in prevention, diagnosis, and multidisciplinary management of oral and pharyngeal cancer; i) sponsor and promote continuing education for health-care professionals on the multidisciplinary management of all phases of oral cancer and its sequelae; and j) strengthen organizational approaches to reducing oral cancer by developing organized cooperative and collaborative arrangements, funding formal centers, and involving commercial firms.

CDC will use these recommended strategies to develop programs to reduce the burden of oral and pharyngeal cancer in the United States. Through the Oral Cancer Roundtable, a group of conference and meeting participants, CDC will communicate to interested agencies, organizations, and state health departments ways in which they can implement elements of the national plan. The Roundtable will help CDC track the efforts and progress of these groups.

INTRODUCTION

During the past decade, federal health agencies have focused on reducing the incidence of oral and pharyngeal cancer and increasing the 5-year survival rate from these cancers in the United States. Beginning with a consortium of health agencies in 1992 (and including a strategic planning conference in 1996 and a follow-up meeting in 1997), CDC has been involved in concerted efforts to establish a national plan for preventing and controlling these cancers. This report presents recommended strategies for action from the 1996 conference and a list of priority recommendations from the 1997 meeting. These recommendations will enable CDC to develop a coordinated national plan to reduce morbidity and mortality from oral and pharyngeal cancer in the United States.

ORAL AND PHARYNGEAL CANCER

Oral cancer (i.e., cancer of the lip, tongue, floor of the mouth, palate, gingiva and alveolar mucosa, buccal mucosa, or oropharynx)* accounts for 2%–4% of cancers diagnosed annually in the United States; approximately two thirds occur in the oral cavity, and the remainder occurs in the oropharynx (1). In 1998, this diagnosis will be made in an estimated 30,300 Americans; approximately 8,000 deaths (5,200 males and 2,800 females) are expected in this year (2). Ninety-five percent of cases of oral cancer occur among persons aged >40 years, and the average age at diagnosis is 60 years (3). In 1950, the male-to-female ratio of oral cancer incidence was approximately 6:1; by 1997, it was approximately 2:1. The changing ratio is likely the result of the increase in smoking among women in the past three decades (3). In addition, cancer is an age-related disease, and in the United States, the number of women aged >65 years now exceeds the number of men aged >65 years by almost 50% (3). During 1990–1994, the annual incidence rate among black males in the United States was 1.6 times higher than the rate among white males (20.1 versus 12.9 new cases per 100,000) and the annual mortality rate among black males was 2.5 times higher (7.6 versus 3.1 deaths per 100,000); the annual incidence rate among black females was slightly higher than that among white females (5.6 versus 4.9 new cases per 100,000), as was the annual mortality rate (1.8 versus 1.2 deaths per 100,000) (4). Despite aggressive combinations of surgery, radiation therapy, and chemotherapy, the 5-year survival rate for oral cancer is poor (blacks: 35%; whites: 55%) (1,5).

Tobacco smoking (i.e., cigarette, pipe, or cigar smoking), particularly when combined with heavy alcohol consumption (i.e., ≥ 30 drinks per week), has been identified as the primary risk factor for approximately 75% of oral cancers in the United States (6). The use of tobacco in other forms (i.e., snuff and chew) has also been identified as a risk factor (7–9), as have certain other lifestyle and environmental factors (e.g., diet and occupational exposure to sunlight) (10).

Approximately 90% of oral cancer lesions are squamous cell carcinomas. Persons who have oral cancer often develop multiple primary lesions (i.e., field cancerization), and they develop second primary tumors at a rate of approximately 4% annually (11). Persons having primary oral cancer are more likely to develop a second primary cancer of the aerodigestive tract (i.e., oral cavity, pharynx, esophagus, larynx, and lungs)

*Hereafter, pharyngeal cancer is also included in the term *oral cancer*.

(12,13). The initially diagnosed disease accounts for one half of the deaths caused by oral cancer; one fourth of these deaths are due to a second primary cancer, and the remaining one fourth are attributable to other illnesses (13).

Diagnosing cancers at an early stage is crucial to improving survival rate and reducing morbidity. At the time of diagnosis of oral cancer, 36% of persons have localized disease, 43% have regional disease, and 9% have distant disease (for 12% the disease is unstaged) (4). The 5-year survival rate for persons having oral cancer is 81% for those with localized disease, 42% for patients with regional disease, and 17% for those with distant metastases (4). During the past decade, at diagnosis stage has not changed significantly (3).

ORAL CANCER STRATEGIC PLANNING CONFERENCE

Background

In 1992, a consortium of health agencies led by CDC and the National Institute of Dental Research (NIDR) of the National Institutes of Health began to establish goals, objectives, and programs to reduce oral cancer morbidity and mortality in the United States. The Oral Cancer Work Group, which was formed as part of this initiative, subsequently developed short-term and long-term goals for preventing and controlling oral cancer. A list of these goals was disseminated to interested organizations and individuals in 1993.

One of the recommendations of the Oral Cancer Work Group was to summarize the state of the science regarding oral cancer. In response, CDC commissioned nine background papers regarding the prevention, control, and treatment of the disease and addressing current knowledge, emerging trends, opportunities, and barriers to further progress. The authors, representing several specialties and expertise, drew on current literature reviews, in-depth critiques, and personal experience.

The Oral Cancer Work Group also suggested that CDC convene a conference to develop national strategies to help make oral cancer prevention and control a higher public health priority. Subsequently, CDC, in partnership with NIDR and the American Dental Association (ADA), formed a conference planning group. The planning group, along with a larger cadre of oral cancer experts, developed a draft set of strategies. This draft and the nine background papers were distributed to invited participants before the conference.

Conference Format

The Oral Cancer Strategic Planning Conference was held August 7–9, 1996, at the ADA headquarters in Chicago. Participants included 125 invited experts in oral cancer prevention, treatment, and research; both the private and public sectors were represented. Following brief welcoming remarks by ADA, CDC, and NIDR representatives, nationally recognized experts made presentations on the etiology of oral cancer, its epidemiology, ongoing and needed research, and clinical experience with five other cancers (i.e., leukemia and breast, cervical, lung, and prostate cancers). A survivor of oral cancer described the human impact of the disease.

Conference participants broke into five work groups: advocacy, collaboration, and coalition building; public health policy; public education; professional education and practice; and data collection, evaluation, and research. Each work group had a chairperson and co-chairperson who were preselected from the conference participants; toward the conclusion of the conference, chairpersons presented their work groups' recommended strategies to all conference participants, who provided oral and written feedback. The work groups made revisions, including comments raised during the general session.

After the conference, the recommended strategies were disseminated to all participants for final review and comments. These last comments were incorporated to produce the finalized recommended strategies to reduce oral cancer morbidity and mortality in the United States.

Recommended Strategies from Work Groups

Advocacy, Collaboration, and Coalition Building

The work group on advocacy, collaboration, and coalition building (e.g., formation by the oral health community of partnerships with other health professionals and public or private organizations to facilitate increased awareness of the risk factors for oral cancer) developed three main recommended strategies.

- Establish an ongoing, institutionalized mechanism to implement and monitor progress made regarding the recommended strategies developed during the conference.
- Urge professionals in oral health and other health disciplines to become more actively involved in community health concerns, especially in preventing tobacco and heavy alcohol use, by
 - developing a comprehensive advocacy training program for a core group of oral health professionals;
 - recruiting persons from the health community and enrolling them in a national database for tobacco and oral cancer advocacy;
 - designing outreach programs to encourage local and state dental societies to be proactive in oral cancer and related coalitions;
 - establishing an advocacy network of oral cancer survivors; and
 - developing a speakers bureau of sports figures and other prominent persons willing to speak about risk factors for oral cancer and the importance of its early detection.
- Promote the publication and dissemination of the U.S. Department of Health and Human Services' biennial *Report to Congress on Tobacco Control Activities in the United States*. This document, mandated by the Comprehensive Smoking Education Act of 1984 (14) and the Comprehensive Smokeless Tobacco Health Education Act of 1986 (15), should review completely the health effects of and trends in tobacco use. It should also serve as a tool to update policymakers, the media, and the public on smokeless tobacco use and oral health.

Public Health Policy

This work group presented its recommended strategies in four categories.

Prevention and Control of Tobacco and Alcohol Use.

- Increase excise taxes on tobacco and alcohol products to provide targeted funding for oral cancer prevention programs.
- Strengthen and enforce laws regarding youth access to tobacco and alcohol.
- Give the U.S. Food and Drug Administration regulatory authority over tobacco, because nicotine is an addictive drug.
- Prohibit all advertising and promotional activities by the tobacco industry and conduct a well-funded counteradvertising campaign that focuses on cigarettes, cigars, pipe tobacco, and spit tobacco.
- Deny federal health and medical research funding to organizations that accept health research funding from the tobacco industry or its research institutes.*
- Increase excise taxes on spit tobacco to an amount equal to or greater than the taxes on cigarettes.
- Encourage professional sports teams to ban the use of tobacco products among team members during practices and games.
- Add strong statements to tobacco and alcohol warning labels about the risk of oral cancer. Ensure that tobacco warning labels cover 25%–30% of the front or back of a product's package and advertising copy. Model warnings after those used in Australia and Canada.

Professional Knowledge and Behaviors.[†]

- Require instruction in preventing and controlling tobacco and alcohol use, including tobacco cessation, at all levels of training in dental, medical, nursing, and related health-care disciplines.
- Ensure that clinicians learn procedures to detect oral cancer that are appropriate to their professional practice.
- Urge all health professionals to routinely assess tobacco and alcohol intake by their patients.
- Encourage health-care agencies and professionals to recommend that all clinicians who deliver primary health care routinely examine their patients for oral cancer.[‡]

*This strategy generated considerable discussion among the conference participants. The work group recognized this strategy could negatively affect research support for oral cancer but still recommended it.

[†]These strategies complement those developed by the work group on professional education and practice but are listed here because of their implications for public policy.

[‡]The U.S. Preventive Services Task Force states that "there is insufficient evidence to recommend for or against routine screening of asymptomatic persons for oral cancer by primary care physicians" but that "clinicians should remain alert to signs and symptoms of oral cancer and premalignancy in persons who use tobacco and alcohol" (16). The work group, however, believed that all persons should be routinely examined and chose a stronger recommendation.

Compensation.

- Work with the ADA and the American Medical Association to reaffirm that existing codes for reimbursement (e.g., Common Procedure Terminology and Common Dental Terminology) appropriately identify oral cancer examinations as part of the standard oral examination.
- Encourage Medicaid, Medicare, traditional insurance plans, and managed-care entities to make oral cancer examinations an integral part of comprehensive physical and oral examinations.
- Base reimbursement for oral cancer examinations on the service provided rather than the academic degree of the provider.

National Programs.

- Designate federal funding for a national program of oral cancer prevention, early detection, and control that includes support for outcomes assessment and policy-based research.

Public Education

Seven major strategies were recommended by the work group on public education.

- Develop and disseminate guidelines and lists of resources to assist communities (e.g., states, counties, cities, towns, and members of organizations and institutions) in developing, implementing, and evaluating models for oral cancer education. This effort could include an inventory of available guidelines, literature, processes, and educational models.
- Develop, implement, and evaluate statewide models to educate all relevant groups. These models should be tailored to local needs, practical, culturally appropriate, and user friendly and should include the following content areas:
 - risk factors for oral cancer (e.g., tobacco use, alcohol use, and nutritional deficiencies);
 - signs and symptoms of oral cancer;
 - procedures for a thorough oral cancer examination and the ease with which the examination can be performed; and
 - methods of public advocacy.
- Persuade relevant CDC and National Institutes of Health decisionmakers, members of Congress, and members of other organizations to secure funding for statewide oral cancer model demonstration projects and to establish an oral health component in CDC's Initiatives to Mobilize for the Prevention and Control of Tobacco Use (IMPACT) program.
- Develop and conduct a national campaign to raise public awareness of oral cancer and its link to tobacco use and heavy alcohol consumption. The campaign

might include a mascot or logo, sports figures or other distinguished persons as spokespersons, or a national oral cancer awareness week.

- Ensure that behavioral and educational research in oral cancer is included in the budget of organizations that sponsor such research (e.g., the National Institutes of Health, universities, and foundations).
- Increase the representation of educators, behavioral scientists, and oral cancer specialists on the grant review committees of cancer and dental research institutions.
- Ensure that a national research agenda is developed that includes the following:
 - ongoing surveillance to monitor knowledge, opinions, attitudes, and practices of the public, especially populations at high risk for oral cancer;
 - surveys of the knowledge, opinions, attitudes, and practices of relevant health-care providers regarding oral cancer;
 - evaluations of the effectiveness of educational interventions among targeted populations;
 - changes in existing survey instruments (e.g., the National Health Interview Survey) to include items on oral cancer comparable to items on other cancers;
 - inclusion of oral cancer questions in state Behavioral Risk Factor Surveillance System surveys;
 - determination of the proficiency of persons who have been taught to perform an oral cancer self-examination; and
 - assessment of the quality (e.g., reading level or scientific accuracy), quantity, and availability of educational materials directed to the public about oral cancer.

Professional Education and Practice

This work group developed five recommended strategies.

- Develop health-care curricula that require competency in prevention, diagnosis, and multidisciplinary management of oral cancer, including the prevention and cessation of tobacco use and alcohol abuse.
- Promote soft tissue examination for oral cancer as a standard part of a complete patient examination.
- Develop, promote, and maintain a database of all professional education materials related to oral cancer.
- Define, identify, develop, and promote centers of excellence in oral cancer management.
- Sponsor and promote continuing education for health-care professionals on the multidisciplinary management of all phases of oral cancer and its sequelae.

In addition, the work group identified seven initiatives that would facilitate achievement of their recommended strategies: develop educational standards and standards

of care for oral cancer; standardize techniques for oral cancer examination and implement them consistently; create a national speakers bureau with standardized educational materials; place an oral cancer home page on the World Wide Web; create guidelines for developing screening and detection programs; develop self-instructional materials for health professionals on a range of topics (e.g., risk factors, early detection, and counseling of high-risk patients); and identify and catalog professional education materials, determine deficits in these materials, and ensure access to the cataloged materials.

Data Collection, Evaluation, and Research

These recommended strategies would facilitate research regarding the etiology, prevention, and treatment of oral cancer and would translate research findings into effective public health action.

- Increase funding or target existing funding to initiate and sustain research concerning oral cancer.
- Improve the capacity of individual health practitioners and small medical centers to participate in research regarding prevention strategies and therapeutic approaches.*
- Develop curricula for basic preparation and continuing education for health professionals that will improve their knowledge of the nature, value, implementation, and importance of well-designed and well-conducted research studies.
- Improve researchers' access to tissues, study populations, and data sources. Possible approaches include
 - using population-based cancer registries for follow-up studies;
 - combining information from state-based population-based cancer registries and from national registries (e.g., the Surveillance, Epidemiology, and End Results [SEER] program) to help develop an enhanced descriptive epidemiology of oral cancer, particularly for smaller subpopulations insufficiently represented in the SEER or state registries;
 - encouraging the use of existing databases, either singly or in combination, to address questions about oral cancer care, consequences, and costs (e.g., one such database combines SEER incidence and survival data for Medicare beneficiaries with their Medicare claims data);
 - developing a systematic approach to providing researchers with access to tissue specimens and detailed information about the behavioral and medical characteristics of persons who are at high risk for oral cancer, have premalignant lesions, or currently have oral cancer; finding creative ways to share

*This strategy would facilitate execution of multicenter studies, which are often needed to produce highly generalizable findings and to provide adequate statistical power to detect relatively small differences. It also recognizes the growing trend toward treating oral cancer in ambulatory settings and within managed-care delivery systems. Differences in treatment outcomes for all the major delivery systems and settings cannot be assessed completely if physicians' and dentists' offices are not included in research studies of small medical centers.

- appropriate biopsy specimens, research subjects and patients, and research findings so that researchers can maximize the information gained from biological studies; and developing laboratory assays that conserve specimens, thus allowing for multiple assessments of the same tissue; and
- evaluating innovative approaches for identifying persons at greatest risk for oral cancer and recruiting them for research studies (e.g., form partnerships with organizations serving residents of homeless shelters or clients of alcohol treatment centers).
- Develop valid and reliable patient-oriented indices of health, quality of life, and functioning.
 - Obtain input from affected groups (e.g., persons who are the subjects of research, surveillance, or treatment; professional-school students; and clinical practitioners) about how research or training in research can best be accomplished. Conduct focus groups and gather other information to refine research questions and formulate effective ways to obtain responses, cooperation, and compliance from research subjects.
 - Create multidisciplinary groups to facilitate movement of findings in two directions—from basic research to applied research and from research in the clinical sciences, epidemiology, and health-services delivery to basic science—thus helping to focus basic research efforts. Such strategies may include the following:
 - developing innovative science transfer techniques (e.g., Internet applications) for researchers, clinicians, and the public;
 - develop effective means of communicating the complex biological processes to clinicians, students, and the public; and
 - increasing research on how health-care practitioners and the public understand and act on the concept of risk of a disease and its consequences.
 - Strengthen organizational approaches to reducing oral cancer by developing cooperative and collaborative arrangements, funding formal centers, and involving commercial firms. The following means are suggested:
 - consortia of researchers and medical and dental practitioners could share patient sources, standardize clinical protocols, achieve adequate sample sizes, recruit patients and at-risk persons for research studies, and enhance science transfer; individual practitioners as well as organizations (e.g., alcohol treatment centers) that serve populations at risk for oral cancer or its sequelae could be sources of study subjects;
 - other formal centers could be established in addition to those funded by NIDR and the National Cancer Institute; and
 - commercial firms could use their marketing and distribution systems to enhance science transfer, health promotion, and disease prevention activities; in addition, they could join with academic or government groups to fund or otherwise facilitate research.

ORAL CANCER WORKING GROUP

The Oral Cancer Working Group, a multidisciplinary group who attended the 1996 Oral Cancer Strategic Planning Conference, met September 29–30, 1997, to identify 10 strategies from the 1996 meeting recommendations to receive immediate attention and implementation by the agencies they represented. The Oral Cancer Working Group considered political and scientific changes that had occurred after the 1996 conference (e.g., the U.S. Food and Drug Administration had been given regulatory authority over tobacco, legal cases involving tobacco had been settled in several states, national tobacco legislation had been proposed, and four comprehensive oral cancer research centers had been funded by NIDR) and selected strategies the group could effect (as opposed to strategies already under way as a result of the leadership and support of other groups). Leadership at the 1997 meeting was shared by representatives of ADA, the American Association of Dental Research, the Association of State and Territorial Dental Directors, CDC, the International Society of Oral Oncology, NIDR, and Oral Health America. The 10 priority strategies are as follows.

Advocacy, Collaboration, and Coalition Building

- Establish a mechanism to implement and monitor progress made regarding the recommended strategies developed during the 1996 national conference.
- Urge oral health professionals to become more actively involved in community health concerns.

Public Health Policy

- Require instruction in preventing and controlling tobacco and alcohol use at all levels of training in dental, medical, nursing, and related health-care disciplines.
- Encourage Medicaid, Medicare, traditional insurance plans, and managed-care entities to make oral cancer examinations an integral part of comprehensive physical and oral examinations.
- Designate federal funding for a national program of oral cancer prevention, early detection, and control.

Public Education

- After assessing local needs, develop, implement, and evaluate statewide models to educate all relevant groups.
- Develop and conduct a national campaign to raise public awareness of oral cancer and its link to tobacco use and heavy alcohol consumption.

Professional Education and Practice

- Develop health-care curricula that require competency in prevention, diagnosis, and multidisciplinary management of oral cancer.

- Sponsor and promote continuing education for health-care professionals on the multidisciplinary management of all phases of oral cancer and its sequelae.

Data Collection, Evaluation, and Research

- Strengthen organizational approaches to reducing oral cancer by developing cooperative and collaborative arrangements, funding formal centers, and involving commercial firms.

At the 1997 follow-up meeting, the Oral Cancer Working Group created a smaller group known as the Oral Cancer Roundtable. Members of the Roundtable will communicate among themselves to discuss implementation of the priority recommendations and the recommendations from the 1996 conference and to share information on progress made. Through the Roundtable, CDC will communicate to interested agencies, organizations, and state health departments ways in which they can implement elements of the national plan. The Roundtable will help CDC track the efforts and progress of these groups.

CONCLUSION

National efforts to reduce morbidity and mortality associated with oral cancer must focus on two areas: primary prevention (i.e., reducing risk factors) and early detection. Although persons at high risk for the disease are more likely to visit a physician than a dentist, physicians may be less likely than dentists to perform an oral cancer examination on such patients (17–21). Thus, all primary-care providers must assume more responsibility for counseling patients about behaviors that put them at risk for developing this cancer, examining patients who are at high risk for developing the disease because of tobacco use or excessive alcohol consumption (22), and referring patients to an appropriate specialist for management of a suspicious oral lesion. Comprehensive education of medical and dental practitioners in diagnosing and promptly managing early lesions could facilitate the multidisciplinary collaboration necessary to detect oral cancer in its earliest stages. Furthermore, because of the public's lack of knowledge about the risk factors for oral cancer and because this disease can often be detected in its early stages (21,23), the public's awareness of oral cancer (including its risk factors, signs, and symptoms) must also be increased.

Oral cancer occurs in sites that lend themselves to early detection by most primary health-care providers and, to a lesser extent, by self-examination. Heightened awareness in the general population could help with early detection of this cancer and could stimulate dialogue between patients and their primary health-care providers about behaviors that may increase the risk for developing oral cancer. Recent advances in understanding the molecular events involved in developing cancer might provide the tools needed to design novel preventive, diagnostic, prognostic, and therapeutic regimens to combat oral cancer. Acquiring greater knowledge of the biology, immunology, and pathology of the oral mucosa may also help to reduce the morbidity and mortality from this disease.

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