

# Demographics and occurrence of oral and pharyngeal cancers

The outcomes, the trends, the challenge

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**C**ancer of the oral cavity and pharynx usually are surface malignancies whose signs and symptoms can be recognized early. Cancers of the oral cavity are malignancies arising in the lip, tongue, floor of the mouth, gingivae, palate, buccal mucosa/vestibule and salivary glands. Pharyngeal cancers describe those developing in the ton-

sillar fossa, oropharynx, nasopharynx and hypopharynx. Nearly 90 percent of these cancers are carcinomas, which occur in the stratified squamous epithelium lining these anatomical areas.<sup>1</sup> Carcinomas are tumors that develop from uncontrolled growth of single cells or clones of cells.

This article provides a brief review of current data and literature regarding the status and incidence trends of, mortality associated with and rates of survival of oral and pharyngeal cancers.

## OCCURRENCE AND SURVIVAL RATES

Oral and pharyngeal cancers represent approximately 3 percent of all cancers in the United States.<sup>1,2</sup> In 2001, it is estimated that these cancers will account for 30,100 new cases and 7,800 deaths.<sup>2</sup> The five-year relative survival

rate is low: 58 percent for whites and 34 percent for African-Americans. It has remained relatively unchanged for the past three decades, despite advances in appropriate treatment<sup>3,4</sup> (Table 1). In addition, for

**Overview.** This article summarizes current trends in the occurrence of, mortality rates associated with and rates of survival of oral and pharyngeal cancer.

**Methods.** The author reviewed relevant data and literature on these aspects of oral and pharyngeal cancer, including data from the National Cancer Institute's Surveillance, Epidemiology and End Results program collected from 1973 to 1998.

**Results.** The occurrence of oral and pharyngeal cancer in the United States remains constant, at about 30,000 new cases diagnosed each year. There has been no marked improvement in the five-year survival rates, which remain at about 50 percent, despite advances in surgery and radiation. Detection of early, localized lesions has not improved significantly during the past three decades. There is a minor trend toward a younger age at diagnosis and a slight increase among women.

**Conclusions.** On the basis of epidemiologic data, it appears that the most important approach to decreasing morbidity and mortality associated with oral cancer is increasing early detection of localized lesions combined with appropriate treatment. Concomitantly, aggressive counseling is vital to prevent use and encourage cessation of tobacco and alcohol use.

**Clinical Implications.** Professional and public education about oral and pharyngeal cancer needs to be improved, and clinicians must emphasize the need for and perform routine oral cancer examinations to promote early diagnosis and treatment.



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those who survive, there is a large risk of developing a new primary head or neck cancer.<sup>1</sup> This risk appears to vary between 10 and 30 percent, and it is greater among smokers. Furthermore, and very importantly, increased morbidity resulting from aggressive treatment affects the quality of life of most of those who survive.

When one sorts out the reasons for these very poor outcomes, it becomes apparent

**TABLE 1**

## ORAL AND PHARYNGEAL CANCER, UNITED STATES, 1992-1997: STAGE AT DIAGNOSIS AND RELATIVE FIVE-YEAR SURVIVAL RATES, BY RACE.\*

VARIABLE	INCIDENCE BY RACE (%)	
	White	Black
<b>Stage at Diagnosis</b>		
Localized (stages I and II)	38	18
<b>Five-Year Survival Rate by Stage</b>		
Localized	82	72
Regional metastasis	45	29
Distant metastasis	21	18
All cases	58	34

\* Source: National Cancer Institute.<sup>4</sup>

**ETIOLOGY**

The box, “Risk Factors for Oral and Pharyngeal Cancers” (page 10S), outlines the primary risk factors for oral and pharyngeal cancers. Foremost among them are the use of tobacco products and excessive alcohol consumption, which are estimated to account for 75 percent of these cancers in the United States.<sup>5-7</sup> Other potential risk factors are exposure to certain viruses (such as human papillomavirus<sup>8-10</sup>) and use of marijuana.<sup>11</sup> Nutritional factors, particularly the consumption of fresh fruits and vegetables, appear to be associ-

ated with decreased risk of developing these cancers.<sup>12-14</sup>

Age also is a risk factor; 90 percent of oral cancers occur in people older than the age of 45 years. The mean age of onset is approximately the seventh decade of life. This makes sense, since cellular biological alterations due to long-term exposure to environmental pollutants, habits such as smoking and alcohol consumption, viruses, poor nutrition and chemicals in foods all would appear to affect the homeostatic stability of gene products that control epithelial cell proliferation and death. New trends, however, inevitably emerge; recently, there has been an increase in the number of adults in their 20s and 30s who have developed oral cancer, especially cancer of the tongue, without any apparent risk factors such as tobacco use or immunosuppression.<sup>15-17</sup>

that the ineffectiveness of many treatments and the high mortality rates for oral cancer are attributable to the fact that most oral cancers are advanced lesions by the time they are diagnosed. Also, the aggressive treatment required to improve cure rates for advanced lesions is associated with increased morbidity.

The disappointing and frustrating aspect is that while oral cancers can be detected at early stages by a visual and tactile examination that takes only about 90 seconds, too few practitioners are conducting these examinations. Unfortunately, the diagnosis of oral cancer at an early stage has not improved over the past three decades, which may reflect the lack of effective professional and public education (Tables 2 and 3). Early diagnosis by definition—diagnosis at cancer stages I and II—refers to cases in which the oral tumor does not exceed four centimeters in its largest diameter and has not spread to adjacent structures or tissues, and in which there has been no metastasis to regional cervical lymph nodes or to other organs. Early detection of oral cancers should reduce morbidity and decrease mortality. As shown in Table 1, those diagnosed with oral cancers in a localized stage have a higher five-year survival rate than do those diagnosed at later stages.

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**INCIDENCE BY SEX AND SITE**

The most recent incidence rates for cancers of the oral cavity and pharynx are from the National Cancer Institute’s Surveillance, Epidemiology, and Ends Results, or SEER, program for the 1994-1998 interval.<sup>4</sup> Incidence rates represent the number of new cases of oral and pharyngeal can-

cers in a specified population during a year, which are expressed as the number of cases per 100,000 people. Incidence in men was 2.6 times that of women (14.8 compared with 5.8), and blacks had a higher rate than whites (12.4 compared with 9.7). The highest rate reported was among black men, with 20.5 cases per 100,000 people. Among women, rates for blacks and whites were alike (6.1 compared with 5.8).<sup>3</sup>

Although oral cancer occurrence in men is more frequent than in women, the sex gap is narrowing slowly. Excluding the pharynx, the male:female ratio for oral cancer is 1.8:1. This finding is explained partly by the increased and more prolonged use of tobacco products by women. Additionally, lip cancer, which occurs predominantly in white men, has been decreasing in incidence in the United States for decades.

The tongue remains the most common site of oral cancer, with 2.5 cases per 100,000 people for the 1994-1998 period. A comparison of national data between 1973 and 1984 with those from the period between 1985 and 1996 reveals that the prevalence of tongue cancer has increased from 26 percent to 30 percent of all oral cancers.<sup>17</sup> The tongue is followed by the lip (17 percent) and the floor of the mouth (14 percent).

Data for oral cavity and pharyngeal cancer mortality rates come from the SEER program.<sup>4</sup> The mortality rate is the number of deaths with cancer given as the underlying cause of death in a specified population during a year, expressed as the number of deaths per 100,000 people. The

**TABLE 2**

<b>ORAL CANCER, UNITED STATES, 1973-1996: STATUS COMPARING 11-YEAR INTERVALS FOR SITES AND STAGE AT DIAGNOSIS.*</b>				
<b>SITE</b>	<b>INCIDENCE DURING STUDY INTERVAL</b>			
	<b>1973-1984</b>		<b>1985-1996</b>	
	<b>n<sup>†</sup></b>	<b>L<sup>‡</sup> (%)</b>	<b>n</b>	<b>L %</b>
<b>Tongue</b>	4,794	44	5,993	45
<b>Lip</b>	4,015	86	3,402	94
<b>Floor of the Mouth</b>	3,041	43	2,804	44
<b>Salivary Glands</b>	2,077	55	2,742	52
<b>Gingivae/Other</b>	4,134	41	4,701	43

\* Source: National Cancer Institute.<sup>4</sup>  
<sup>†</sup> n: Number of cases.  
<sup>‡</sup> L: Localized lesion (cancer stages I and II) at time of diagnosis.

**TABLE 3**

<b>FIVE-YEAR RELATIVE SURVIVAL RATES* FOR THE THREE LEADING ORAL CANCER SITES, UNITED STATES, 1973-1996, COMPARING STUDY INTERVALS BY SEX AND RACE.<sup>†</sup></b>					
<b>SITE</b>	<b>INTERVAL</b>	<b>FIVE-YEAR SURVIVAL RATE (%)</b>			
		<b>Men</b>		<b>Women</b>	
		<b>White</b>	<b>Black</b>	<b>White</b>	<b>Black</b>
<b>Tongue</b>	1973-1984	41	25	48	40
	1985-1996	47	27	58	32
<b>Lip</b>	1973-1984	94	— <sup>‡</sup>	87	—
	1985-1996	95	—	95	—
<b>Floor of the Mouth</b>	1973-1984	52	38	64	41
	1985-1996	52	33	63	59

\* With an adjustment to expected longevity.  
<sup>†</sup> Source: National Cancer Institute.<sup>4</sup>  
<sup>‡</sup> Dashes indicate that numbers were too low to enable calculation of a five-year survival rate.

overall age-adjusted U.S. mortality rate for oral and pharyngeal cancers for the 1994-1998 period was 2.6. Mortality in men (3.9) was more than twice that of women (1.4). Blacks had nearly twice the mortality of whites (4.4 vs. 2.4).

The location of oral and pharyngeal cancers affects the five-year survival rates. For example, survival rates for carcinomas of the base of the tongue (distal to the circumvallate papillae) are very low compared with those for carcinomas on the oral portion of the tongue. This finding probably is explained by an associated delay in diag-

## RISK FACTORS FOR ORAL AND PHARYNGEAL CANCERS.

- Use of Any Kind of Tobacco Product
- Heavy Use of Alcohol
- Certain Viruses (Such as Human Papillomavirus)
- Low Consumption of Fruits and Vegetables
- Marijuana Use
- Age Older Than 45 Years
- Black Race
- Male Sex

nosis (poorer access for examination than with the oral portion of the tongue) and the more advanced staging at diagnosis of this cancer. The relatively low occurrence of gingival and alveolar mucosal cancers suggests that there is little or no association between denture-wearing and malignant transformation.

### RACE AND ETHNICITY AS FACTORS

Race and ethnicity appear to be influential factors, likely because of genetic predisposition and/or socioeconomic factors, such as access to the health care system and limited awareness of methods of prevention and early detection of oral cancer. The highest incidence and mortality rates for oral cancers are found among blacks. Among American black men, the oral cavity is the fourth most frequent site of cancer.

These differences also are reflected in state data. For example, among men of all races in California, the adjusted annual incidence rate for all cancers for the period from 1993 to 1997 shows that the oral cavity was the seventh most common cancer site (14 per 100,000); in black men, it was the fourth leading site. By race or ethnicity, the incidence rate per 100,000 Californians was as follows: blacks, 17.3; non-Hispanic whites, 15.3; Asians, 10.6; and Hispanics, 7.9.<sup>17,18</sup> These data are similar to national incidence and mortality rates.<sup>3</sup>

### METASTASES

Although spread of oral cancer to regional neck lymph nodes is common and indicates an

advanced tumor, metastasis to other organ systems below the clavicle is rare. In these latter instances, the lung is the most common site. Metastases from oral cancers occur primarily through the lymphatic system, while distant metastases are hematogenous. Obviously, oral cancers that have metastasized require more aggressive treatment, worsen the prognosis and increase morbidity. The ability of malignant cells to metastasize varies among patients and depends on certain cell surface molecules and extracellular matrix interactions.

### CONCLUSION

In summary, the epidemiologic data for oral and pharyngeal cancers yield some startling facts:

- the poor five-year survival rate continues for patients with these cancers despite advances in treatment;
- most of these cancers are diagnosed as advanced, late-stage tumors;
- there are racial and ethnic disparities in incidence, mortality and five-year survival rates;
- tongue cancer has increased among people younger than 40 years of age.

The challenge for us in the dental profession is to ensure that all adult patients have a regular and comprehensive oral cancer examination, as well as to educate them about the need for such an examination and about the known risk factors for these cancers. Race, ethnicity and age cannot be altered; however, lifestyle behaviors such as use of tobacco and alcohol are amenable to change and must be addressed. The dental profession has a well-deserved reputation for preventing other oral diseases. Now it is time that we focus on the prevention and early detection of oral cancer. ■

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