Oral Cancer and Premalignancy in 2015: Dirty Little Secrets That Kill People
New Mexico Health Resources
23rd Annual Health Provider Retreat
June 12-13, 2015
Sagebrush Inn and Suites
Taos, NM

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References
References

Etiology and Epidemiology

Estimated New Cancer Cases* in the US in 2014

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Men 855,220</th>
<th>Women 810,320</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>22%</td>
<td>29%</td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>14%</td>
<td>13%</td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Melanoma of skin</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Kidney &amp; renal pelvis</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Oral cavity &amp; pharynx</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Leukemia</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Liver &amp; intrahepatic</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>bile duct</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All other sites</td>
<td>20%</td>
<td>21%</td>
</tr>
</tbody>
</table>

*Includes basal cell and squamous cell cancers and in situ carcinomas except in situ cervical.
New Oral Cancer Cases and Deaths – 2014

![Image of new oral cancer cases and deaths graph]

*Estimated Number* of New Cancer Cases and Deaths by Sex, US, 2014

<table>
<thead>
<tr>
<th>Site</th>
<th>Estimated New Cases</th>
<th>Estimated Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>All Sites</td>
<td>825,220</td>
<td>815,120</td>
</tr>
<tr>
<td>Oral cavity &amp; pharynx</td>
<td>14,400</td>
<td>7,100</td>
</tr>
<tr>
<td>Other oral cavity</td>
<td>2,800</td>
<td>1,800</td>
</tr>
</tbody>
</table>

Source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2015.
Risk Factors

- Intrinsic
  - Nutrition
  - Anemia
  - Immunosuppression
  - Oncogenes

- Extrinsic
  - Tobacco
  - Alcohol
  - Tobacco AND alcohol (40x risk)
  - Ultraviolet radiation
  - Microbes
  - Trauma (?)
Tobacco Advertising

- Increased graphic warnings for cigarettes scheduled for September 2012
- Congress told the images would be frightening and disturbing to smokers
- Died a “political death”

Smoking Alternatives

- Smokeless (spit) tobacco
- Snus
- Hookah pipes
- E-cigarettes
Smokeless Tobacco Sequellae

- Oral and pharyngeal cancer
- Esophageal cancer
- Stomach cancer
- Pancreatic cancer
- Increased risk of CVD, MI, and CVA
- Addiction to nicotine
- Leukoplakia
- Gingivitis and gingival recession
- Periodontal bone loss
- Tooth abrasion
- Dental caries
- Tooth loss
- Stained and discolored teeth
- Bad breath

Smokeless (Spit) Tobacco

Guide to Quitting Smokeless Tobacco

Tobacco and Baseball Timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1845</td>
<td>Baseball rules written, Spit tobacco use rampant</td>
</tr>
<tr>
<td>1890</td>
<td>Spit tobacco spreads TB</td>
</tr>
<tr>
<td>1899</td>
<td>Honus Wagner removes name from tobacco ads</td>
</tr>
<tr>
<td>1948</td>
<td>Babe Ruth dies of throat cancer</td>
</tr>
<tr>
<td>1950s</td>
<td>Players switch to cigarettes</td>
</tr>
<tr>
<td>1970s</td>
<td>Players switch back to spit tobacco</td>
</tr>
<tr>
<td>1993</td>
<td>Spit tobacco banned in minors</td>
</tr>
<tr>
<td>1998</td>
<td>Bill Tuttle dies</td>
</tr>
<tr>
<td>2010</td>
<td>Tony Gwynn, Spit tobacco banned, has SG cancer during MLB interviews</td>
</tr>
<tr>
<td>2014</td>
<td>Tony Gwynn dies, claiming his SG cancer was due to spit tobacco use</td>
</tr>
</tbody>
</table>
Sean Marsee (1965-1984)

- 12 years old – began using spit tobacco
- 1 can of snuff every 1.5 days
- Won 28 track medals in 400 meter relay
- Said dipping was OK because Walt Garrison used smokeless tobacco
- Continued to dip until his 2nd surgery
- Lost 60 lbs.
- Died 10 months after diagnosis

Sean Marsee (continued)

- 1986 – Betty Marsee sues US Tobacco for $137M

  Walt Garrison sits at defense table every day of the trial *with a tin of tobacco in his back pocket*

Sean Marsee (continued)

- MDACC H&N surgeon, Robert Byers MD, testified that there is no relationship between smokeless tobacco and Sean’s cancer

  "I have been unable ... to find anything of a causal relationship between young people’s use of tobacco and tongue cancer.”
Toxicologist Arthur Furst PhD, testified, "There is probably something in snuff that is anticarcinogenic."

He also testified that he did not agree with the US Surgeon General's conclusion that smoking causes lung cancer and that snuff may cause cancer, but admitted that his beliefs might be in the minority of physicians and health researchers.

Sean Marsee's cancer was blamed on his "lifestyle"

Incriminating evidence was dismissed

US Tobacco was found innocent of any liability in Sean Marsee's death.

Story taken up by 60 Minutes, Saturday Evening Post and Reader's Digest

And so it goes . . .

Snus

Originated in Sweden

Ettan "number one" registered in 1882

Placed under the upper lip

Loose or in pouches

Does not require spitting

Banned by EU in 1992

Sweden and Norway exempt
Hookah Pipes

- 1500s – originated in Persia and India
- Flavored tobacco (shisha) smoke passes through water before inhalation
- 1960s & 1970s – hookah parties (USA)
- 2000s – hookah cafes (USA)
- 2011 – 40.3% of college students tried
- 2012 – 5.4% of HS students tried

E-cigarettes / -cigars / -pipes

- 2003 – developed in China
- 2004 – introduced in China
- 2006 – introduced in Europe
- 2007 – introduced in USA

Television medical talk shows—what they recommend and the evidence to support their recommendations: a prospective observational study

Conclusions: Recommendations made on medical talk shows often lack adequate information on specific benefits or the magnitude of the effects of these benefits. Approximately half of the recommendations have either no evidence or are contradicted by the best available evidence. Potential conflicts of interest are rarely addressed. The public should be skeptical about recommendations made on medical talk shows.
Fig 2 Prevalence of topic categories in 40 episodes of each of The Dr Oz Show (125 topics) and The Doctors (115 topics).

Korownyk C et al. BMJ 2014;349:bmj.g7346

Fig 3 Prevalence of recommendation categories in 40 episodes of each of The Dr Oz Show (479 recommendations) and The Doctors (445 recommendations).

Korownyk C et al. BMJ 2014;349:bmj.g7346

Electronic Cigarettes and Children
**University Suspects Fraud by a Researcher Who Studied Red Wine**

* Published: January 11, 2013

A charge of widespread scientific fraud, involving 36 articles published in 11 journals, was leveled by the University of Connecticut today against Dipak K. Dey, one of its researchers, whose work reported health benefits of red wine.

Dipak K. Dey in 2009. Fraud allegations against him, if verified, could shake the foundations of some research into red wine's health benefits.

Many of the articles reported positive effects from resveratrol, an ingredient of red wine thought to promote longevity in laboratory animals.

The charges, if verified, seem unlikely to affect the field of resveratrol research itself, because Dr. Dey's work was peripheral to its central principles, several of which are in contention: "Today I had to look up who he is. His papers are mostly in specialty journals," said David Steeber, a leading resveratrol expert at the Harvard Medical School. The significance of the case seems more to reflect on the general system of peer review and reporting research money.
### Unhealthy Alcohol Use

<table>
<thead>
<tr>
<th>Category of Use</th>
<th>Prevalence</th>
<th>Definition and Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risky use</td>
<td>30%</td>
<td>&gt;65 years - &gt;7 drinks/week or &gt;3 drinks/occasion&lt;br&gt;&lt;65 years - &gt;14 drinks/week or &gt;4 drinks/occasion</td>
</tr>
<tr>
<td>Problem drinking</td>
<td>Varies</td>
<td>Alcohol-related consequences, e.g., &quot;hangover&quot;</td>
</tr>
<tr>
<td>Alcohol abuse, harmful use</td>
<td>5%</td>
<td>Failure to fulfill major role obligations; use in hazardous situations; alcohol-related legal problems; social or interpersonal problems</td>
</tr>
<tr>
<td>Alcohol dependence, alcoholism</td>
<td>4%</td>
<td>Clinically significant impairment or distress, plus 3 or more of the following: tolerance, withdrawal, excessive time spent obtaining, using or recovering from use, drinking more or longer than intended, inability to control use, continued use despite problems</td>
</tr>
</tbody>
</table>

Saitz R. NEJM 2005;352:596-607

### Ultraviolet Radiation

- **Epitheliotropic DNA virus**
- >120 HPVs
  - Warts
  - Genital cancers
  - Oropharyngeal cancers

### Human Papillomavirus

- **Epitheliotropic DNA virus**
- >120 HPVs
  - Warts
  - Genital cancers
  - Oropharyngeal cancers
HPV Epidemiology

- 20 million Americans are HPV+
- 6 million new cases annually
- 50% of sexually active adults will be HPV+ in their lifetime
- 33,000 HPV-related malignancies annually
- 12,000 HPV-related oral malignancies annually (36.4 percent of cases)

HPV Epidemiology

- 560,000 new cancers world-wide (5.2%)
- HPV 16 and 18 associated with 99.7% of all cervical cancers
- HPV 16, 18, 31, 35 are "high risk" for genital cancers
- HPV 16 associated with oropharyngeal cancer

HPV Prevalence

- Peaks with sexual activity
  - 14-19 year olds – 24.5% HPV+
  - 20-24 year olds – 44.8% HPV+
  - 25-29 year olds – 27.4% HPV+
  - 30-39 year olds – 27.5% HPV+
  - 40-49 year olds – 25.2% HPV+
  - 50-59 year olds – 19.6% HPV+
  - 14-59 year olds – 26.8% HPV+ (average)
**HPV Transmission**
- Infection through microabrasion/trauma
- Perinatal transmission rare
- Venereal transmission common
  - A female college freshman who has one sex partner per year for four years has >85% probability of graduating HPV+
- Self-innoculation and cross-inoculation (genitalia – hands – genitalia) reported
- No non-sexual hand contact

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**HPV Transmission**
- Infection through micro-abrasion or other trauma
- Limited to basal cells of stratified squamous epithelium
- Released when epithelial cells desquamate
- Survive for months on environmental surfaces

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**HPV Infection**
- Most HPV infections cleared by the immune system
  - 97-100% of high-risk HPV infections cleared in 18 months
- Persistent infection may lead to cancer
### HPV-related Cancers

<table>
<thead>
<tr>
<th>SITE</th>
<th>ANNUAL</th>
<th>HPV 16/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervix</td>
<td>12,000</td>
<td>11,500</td>
</tr>
<tr>
<td>Vulvar</td>
<td>3,100</td>
<td>1,600</td>
</tr>
<tr>
<td>Vagina</td>
<td>700</td>
<td>500</td>
</tr>
<tr>
<td>Penis</td>
<td>1,000</td>
<td>400</td>
</tr>
<tr>
<td>Anus</td>
<td>4,700</td>
<td>4,500</td>
</tr>
<tr>
<td>Oropharynx</td>
<td>11,700</td>
<td>7,400</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>33,400</td>
<td>25,900</td>
</tr>
</tbody>
</table>

### HPV and Oral Cancer
- PubMed (10/31/12)
  - Human papillomavirus + oral
    - 501 published manuscripts
- PubMed (3/24/13)
  - Human papillomavirus + oral
    - 2075 published manuscripts
- PubMed (11/1/14)
  - Human papillomavirus + oral
    - 6188 published manuscripts

### Original Article

**Case-Control Study of Human Papillomavirus and Oropharyngeal Cancer**

Gopypambel D’Souza, Ph.D., Armea R. Kremer, Ph.D., Raphael Viscidi, M.D., Michael Pauza, M.D., Carole Fakhy, M.D., M.P.H., Wayne M. Koch, M.D., William H. Westra, M.D., and Maura L. Gillison, M.D., Ph.D.

**Abstract**

Oral HPV infection is strongly associated with oropharyngeal cancer among subjects with or without the established risk factors of tobacco and alcohol use.
What does the data show?
- HPV is an **independent** risk factor for oral and oropharyngeal squamous carcinoma
  - Multiple studies; multiple institutions
  - ~30% prevalence rate of HPV detection in H&N cancer surgical specimens
  - Higher prevalence in oropharyngeal lesions (~35%) than laryngeal (~25%) or oral (<25%) lesions

HPV and Oral Cancer
- Dramatic increase in HPV-related oral cancers
  - 0.8 cases per 100,000 population (1988)
  - 2.6 cases per 100,000 population (2004)
- More common in men
- Thought to be due to increased incidence of oral sex

Which HPV is responsible?
- HPV-16
  - 86.7% of oropharyngeal lesions
  - 68.2% of oral lesions
  - 69.2% of laryngeal lesions
Is HPV-related H&N SCC different?
- Yes
- Better prognosis
- Better clinical outcome

Human Papillomavirus in HNSCC: Recognition of a Distinct Disease Type

Laura Vidal, MD, Maura L. Gillison, MD, PhD


Sex & Oropharyngeal Cancer
- Sexual behavior is associated with oropharyngeal carcinoma
- Related to lifetime # of sex partners
  - Vaginal sex and oral sex
- Open-mouth kissing
- HPV exposure precedes oropharyngeal cancer by at least 10 years
How big is the problem?

Prevalence of Oral HPV Infection in the United States, 2009-2010

Maurice L. Gillison, MD, PhD
Yaserik Rosatian, MD
Joanne Hsu, MD
Zhengyue Tang, MD, PhD
Weilong Xiao, MD
Eoin McCabe, BS
Barry L. Graham, MD
All H. Chaturvedi, PhD

Conclusion: Among men and women aged 14 to 69 years in the United States, the overall prevalence of oral HPV infection was 6.9%, and the prevalence was higher among men than among women.

HPV Vaccines

- Bivalent (HPV 16 and 18) and quadravalent (HPV 16, 18, 6 and 11)
- Little benefit to previously infected individuals
- 49% of teenage girls in USA vaccinated in 2010
HPV Vaccines – 3 Injections

Gardasil
Quadrivalent
Females and males 9-26
Cervical cancer (HPV 16, 18)
Genital warts (HPV 6, 11)

HPV Prophylactic Vaccines and the Potential Prevention of Noncervical Cancers in Both Men and Women

Muhammad G. Gillison, MD, PhD
Division of Hematologic and Solid Tumor Oncology, Dana-Farber Cancer Institute, Boston, Massachusetts

HPV is a common virus that infects about 80% of people at some point in their lives. It can cause cervical cancer, but it can also cause other types of cancer, including laryngeal, oral, and anal cancers. HPV vaccination can prevent these cancers by preventing the virus from infecting people.

HPV Vaccines

HPV vaccines are available in the United States. There are two main types of HPV vaccines: quadrivalent and bivalent.

Quadrivalent HPV vaccine

- Protects against four types of HPV: 6, 11, 16, and 18.
- Used for both girls and boys.
- Protection against cervical cancer caused by HPV 16 and 18.
- Protection against genital warts caused by HPV 6 and 11.

Bivalent HPV vaccine

- Protects against two types of HPV: 16 and 18.
- Used only for girls.
- Protection against cervical cancer caused by HPV 16 and 18.

FDA News Release

FDA approves Gardasil 9 for prevention of certain cancers caused by five additional types of HPV

December 10, 2014

The U.S. Food and Drug Administration today approved Gardasil 9 (Human Papillomavirus 9-valent Vaccine, Recombinant) for the prevention of certain diseases caused by five types of Human Papillomavirus (HPV). Covering nine HPV types, five more HPV types than Gardasil (previously approved by the FDA), Gardasil 9 has the potential to prevent approximately 90 percent of cervical, vulvar, vaginal and anal cancers.

Gardasil 9 is a vaccine approved for use in females ages 9 through 26 and males ages 9 through 15. It is approved for the prevention of cervical, vulvar, vaginal and anal cancers caused by HPV types 16, 18, 31, 33, 45, 52 and 58, and for the prevention of genital warts caused by HPV types 6 or 11. Gardasil 9 adds protection against five additional HPV types—31, 33, 45, 52 and 58 —which cause approximately 20 percent of cervical cancers and are not covered by previously FDA-approved HPV vaccines.
Unanswered Questions

- Do we treat HPV-positive premalignant, i.e., dysplastic, oropharyngeal lesions differently?
- Do we treat HPV-positive malignant oropharyngeal lesions differently?
- Would some oropharyngeal cancers be prevented by HPV vaccination? Yes

Questions with no answers

- Is HPV transmitted by kissing? Deep kissing? How deep? How do you test this?
- If HPV is transmitted by kissing, are you “giving” someone oral cancer?
- Is there a risk of mother-child transmission?

http://www.rdhmag.com/articles/print/volume-30/issue-12/features/hpv-to-test-or-not-to-test.html
Even more questions with no answers

- If a latent infection reappears, how does your spouse know it's not a "new" infection?
- Who should be tested? Everybody?
- Is HPV positivity in an adolescent a marker for sexual activity?
- When do you recheck an HPV+ patient?
- How about the rest of the family?

http://www.rdhmag.com/articles/print/volume-30/issue-12/features/hpv-to-test-or-not-to-test.html

Original Investigation
Sites of Origin of Oral Cavity Cancer in Nonsmokers vs Smokers
Possible Evidence of Dental Trauma Carcinogenesis and Its Importance Compared With Human Papillomavirus

Brenda J. Perry, MBBS, Andrew J. Ziemniak, BPharm, Andrew A. Lovendahl, MBBS, Adis J. Daffarn, MBBS, Adrian S. Hargreaves, BPharm, MBBS, Emily J. Perry, MBBS, LLB, MBBS, FRACS, Neve Hayardeny, MBBS, PhD, and Christopher C. Perry, MBBS, MD (Sydney, Australia). FRACS

Importance. The relatively high and possibly rising incidence of oral cavity squamous cell carcinomas in nonsmokers, especially women, without obvious causative factors is thought to be related to chronic dental trauma and irritation in the oral cavity, and what is its importance compared with human papillomavirus (HPV) oropharyngeal cancer in nonsmokers?

Conclusions and Relevance. Oral cavity cancers occur predominantly at sites of potential dental and denture trauma, especially in nonsmokers without other risk factors. Recognizing the presence of such potential carcinogenic areas would have an impact on prevention and treatment strategies.


Figure Legend:
Trauma and Oral Cancer
Trauma and Oral Cancer

The Role of Dental Prostheses in Alveolar Ridge Squamous Carcinomas
Bruce H. Campbell, MD, David H. Mark, MD, MPH; Eric A. Sorensen, MD, James E. Freije, MD, Christopher J. Schultz, MD

Author Affiliations

Conclusions: In this study, denture use was not an independent risk factor for alveolar ridge carcinomas. Among patients with little or no tobacco or alcohol exposure, the alveolar ridge carcinomas tended to occur in the elderly and in women. Arch Otolaryngol Head Neck Surg. 1997;123:1112-1115

Screening Technologies

Critical evaluation of diagnostic aids for the detection of oral cancer
Screening and Diagnosis

- Vital dye (toluidine blue)
- ViziLite® / ViziLite® Plus with TBlue
- VELscope
- Identafi
- Exfoliative cytology
- Brush biopsy

Toluidine Blue

ViziLite
Variations on a Theme

- Microlux™

- OraScoptic™

ViziLite® Plus with TBlue®

VELscope
Oral Cancer Detection

- 80% survival with localized disease
- 20% survival with distant metastasis
- **EARLY DETECTION = BETTER SURVIVAL**
- 50% with metastasis at diagnosis
- 65% with clinical symptoms at diagnosis

Visual Clinical Examination

- High sensitivity
  - detect abnormality with ease
- Low specificity
  - diagnose abnormality with difficulty
Problem

- 15% of patients have mucosal abnormality (Bouquot, 1986)
- 25% of malignant lesions appear benign (Sandler, 1962, 1966)
- 30% of soft tissue lesions are misdiagnosed (Dimitroulis, 1992)

Problem

- Unsure which lesions require testing
- Uncomfortable performing scalpel biopsy
- Patients resist incisional biopsy
- NOT ALL LEUKOPLAKIAS BIOPSIED

Sandler (JADA, 1966)

- 118,000 VA patients
- 2,758 with visible mouth lesions
- 592 had cytology and biopsy

- 70 of 287 SCC THOUGHT BENIGN
- 20 of 28 CIS THOUGHT BENIGN
- 11 of 1,801 (-) cytologies BECAME MALIGNANT
Traditional Cytology

- 300,000 - 500,000 cells per smear
- Less than 0.005% abnormal cells
- Searching for a “needle in a haystack”
- People are not good searchers (proof reading)

Traditional Cytology

- Psychological habituation
  - eye sees abnormality
  - brain imposes expected pattern
- Sensitivity below threshold
  - don't detect abnormal cells

Folsom (Oral Surgery, 1972)

- 158,996 patients screened over 3 years
- 6,897 (4%) had oral lesions
- 148 cancers (2%) among oral lesions
- 41/148 (31%) **FALSE NEGATIVE CYTOLOGY**
Oral CDx™

- Bridges the gap between visual exam and scalpel biopsy
- Helps to determine which **benign-appearing lesions** in patients with **no risk factors** merit a scalpel biopsy

Oral CDx™

- Optimal sample – full transepithelial sampling
- Optimal search – adaptive, non-algorithmic computing
- Optimal interpretation – oral cytology specialists

### 4.5% Dysplasia or Malignancy in Clinically Benign Lesions

<table>
<thead>
<tr>
<th>BRUSH BIOPSY RESULT</th>
<th>SCALPEL BIOPSY RESULT</th>
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<tbody>
<tr>
<td>Positive</td>
<td>Malignant or Dysplastic</td>
</tr>
<tr>
<td>Atypical</td>
<td>Malignant or Dysplastic</td>
</tr>
<tr>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Not Done</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Positive</th>
<th>Atypical</th>
<th>Negative</th>
<th>Not Done</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malignant or Dysplastic</td>
<td>14</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>29</td>
</tr>
<tr>
<td>Benign</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not Done</td>
<td>2</td>
<td>99</td>
<td>517</td>
<td>517</td>
<td>618</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>114</td>
<td>517</td>
<td>517</td>
<td>647</td>
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</tbody>
</table>
Screening for Oral Cancer: U.S. Preventive Services Task Force Recommendation Statement

DRAFT

Summary of Recommendation and Evidence
The U.S. Preventive Services Task Force (USPSTF) concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for oral cancer in asymptomatic adults.

Clinical Features

Three tests to get—and eight to avoid

Screening tests for cancer, heart disease, and other causes are the most effective in the United States. The U.S. Preventive Services Task Force (USPSTF) recommends screening for cervical, lung, breast, and colorectal cancers. These screenings are based on evidence of their effectiveness in reducing mortality and morbidity. Note that many other cancers are also associated with cancer, and that cancer screening is recommended for many people.

In addition, the cancers are for people who are at no risk, are a high risk, or are people who have signs or symptoms of cancer. If you are at risk, the cancer should be tested for. At-risk people are also people who have signs or symptoms of cancer. They may need the test or should be tested sooner. The USPSTF recommends screening for cancer in asymptomatic adults.

Clinical Features

1. Oral cancer
   - Rating
   - for adults of all ages
   - by a dentist or other healthcare provider.
   - Who needs it: Most people don't need the test unless they are at high risk, because the cancer is relatively uncommon.
   - Risk factors: Smoking, chewing tobacco, excessive alcohol consumption, HPV infection, and weakened immunity from medication, disease, or certain other causes.
Clinical Features

- 90% of cases
  - lower lip
  - ventral tongue
  - floor of mouth
- Most cases present for at least 1 year as an asymptomatic lesion

Clinical Features

- Leukoplakic (white)
  - Endophytic (ulcerating)
  - Exophytic (fungating)
  - Erythroplakic (red)

Therapeutic Modalities
Multidisciplinary Therapy

- Surgery
- Radiation therapy
- Combination therapy
- Periodic reassessment

Prognosis

- Depends on location and progression
  - More anterior location
  - No regional lymph node involvement
  - No distant metastasis

TNM Staging

<table>
<thead>
<tr>
<th>TNM</th>
<th>STAGE</th>
<th>5 YEAR SURVIVAL</th>
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<tbody>
<tr>
<td>T1N0M0</td>
<td>Stage I</td>
<td>85%</td>
</tr>
<tr>
<td>T2N0M0</td>
<td>Stage II</td>
<td>66%</td>
</tr>
<tr>
<td>T3N0M0</td>
<td>Stage III</td>
<td>41%</td>
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<tr>
<td>T1-3N1M0</td>
<td>Stage III</td>
<td>41%</td>
</tr>
<tr>
<td>Any T4</td>
<td>Stage IV</td>
<td>9%</td>
</tr>
<tr>
<td>Any N2-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any M1</td>
<td></td>
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</tr>
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