The webinar will begin shortly

Today's presentation and resources can be found at the MPCA website at [www.m pca.net](http://www.m pca.net) under clinical services & quality/hiv/resources

May 1, 2013

Diane Rydahl, RDA
Clinical Specialist
drydahl@mpca.net
HPV and Oral Cancer

This webinar will outline epidemiology, screening, detection and identifying high risk for oral cancer, treatment challenges for medical and dental providers, and prevention/immunization.
Raise Your Hand

Use the Telephone

See Who Is Talking

Ask a question
Speakers

Peter Gulick DO, FACP, FACOI, FIDSA
Associate Professor, College of Osteopathic Medicine
Associate Professor, College of Human Medicine
Director, MSU HIV/AIDS Hepatitis Clinic
In addition to teaching, Dr. Gulick provides patient care in his Oncology Clinic at the Great Lakes Cancer Institute/MSU Breslin Center and in his Infectious Disease Clinic in Lansing, Michigan. He has taken care of HIV patients for 20 years and hepatitis C patients for 10 years.

Janet Miller, RDH
Janet has worked for over 40 years as a registered Dental Hygienist. She lectures and consults to dental and medical clinicians on implementation of programs to identify specific viruses that can lead to Oral Cancer. Janet is developing a program to prepare dental hygienist to become a participant with the health team. Janet currently works in a private dental practice.

Ann Garvin, RN
Ann is a Registered Nurse and a Certified Nurse-Midwife. She has worked as a staff nurse, childbirth educator, nursing instructor and nurse-midwife. She is currently a Nurse-Consultant to the Breast Cervical Cancer Program for the Michigan Department of Community Health, in Lansing.
Delta Dental Oral Cancer Video

http://www.deltadentalmi.com/oralcancer
HPV Related Head and Neck Cancer

Peter G. Gulick, DO, FACP, FACOI, FIDSA
Associate Professor
College of Osteopathic Medicine
Michigan State University
Case Study

A 58-year-old male has been HIV positive for over 10 years well controlled on HAART medication. He had been diagnosed with localized anal cancer secondary to HPV several years ago and was treated with radiation with control. About 1 year ago he developed pain in his throat with an enlarged anterior cervical node. He was sent to ENT who performed an ENT exam and found a mass on his right tonsil. Biopsy was positive for invasive squamous cell cancer. The cervical lymph node was also positive. He had a radical neck surgery followed by radiation and chemotherapy. The tumor was HPV-16 PCR positive.
Head and Neck Cancer

- 563,823 cases worldwide in 2002
- 298,408 deaths worldwide in 2002
- 45,660 cases in the United States in 2007
  - 8th in incidence among men
  - 14th among women

Head and Neck Squamous Cell Carcinoma (HNSCC)
Oropharyngeal Cancer

- Base of tongue
- Tonsils
- Soft palate
- Pharyngeal wall
Cancer of the Mouth and Pharynx
Incidence Rates, 2002

Age standardized incidence rate per 100,000

Established Risk Factors

- Alcohol
- Tobacco
- Human papillomavirus (HPV)
- Oral hygiene
- Diet
- Family history
- Age, gender, race
HPV and HNSCC

- High-risk HPV specific to tumor cell nuclei
- Clonal virus-tumor relationship
- Viral integration
- Genetic alterations indicative of E6/E7 function
- High viral copy number
- Viral oncogene expression
- Reversal of malignant phenotype
HPV 16 In Situ Hybridization (ISH): SCC In Situ
HPV-Type Distribution in HPV DNA-Positive Oropharynx Cases

- HPV 16: 92%
- HPV 18: 3%
- HPV 33: 3%
- HPV 35: 0.6%
- HPV 45: 0.3%
- HPV 59: 0.3%

N=325.
HPV-Related HNSCC

- Oropharyngeal location
- Palatine and lingual tonsils
- Poorly differentiated (basaloid)
- Nonsmokers, nondrinkers
- Younger age
- Improved prognosis
Incidence and Distribution of Cancers Attributable to HPV

- Cervix
- Oropharynx
- Anus
- Oral cavity
- Larynx
- Vulva
- Penis

Annual number of cases:

- HPV cases
- Total cases

Annual number of cases:

- 0
- 100,000
- 200,000
- 300,000
- 400,000
- 500,000

Murphy M. Presented at IARC 2000.
HPV and Oropharynx Cancer

- Sexual behaviors
- HPV infection
- HPV in tumor

Oropharynx cancer
# Sexual Behaviors

<table>
<thead>
<tr>
<th>Behavior</th>
<th>HPV-positive OR* (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of sex partners</strong></td>
<td></td>
</tr>
<tr>
<td>0-5</td>
<td>1</td>
</tr>
<tr>
<td>6-25</td>
<td>2.7 (1.4-5.5)</td>
</tr>
<tr>
<td>≥26</td>
<td>4.2 (1.8-9.4)</td>
</tr>
<tr>
<td><strong>Number of oral-sex partners</strong></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1-5</td>
<td>3.8 (1.0-14)</td>
</tr>
<tr>
<td>≥6</td>
<td>8.6 (2.2-34)</td>
</tr>
</tbody>
</table>

*Adjusted for age, gender, family history, oral hygiene, alcohol and tobacco use. CI=confidence interval; OR=odds ratio.

## Measures of HPV Infection

<table>
<thead>
<tr>
<th>Exposure Measure</th>
<th>Cases (%)</th>
<th>Controls (%)</th>
<th>OR*</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPV 16 L1 seropositive</td>
<td>57</td>
<td>7</td>
<td>32</td>
<td>15-71</td>
</tr>
<tr>
<td>Oral HPV 16 infection</td>
<td>32</td>
<td>4</td>
<td>15</td>
<td>6.3-37</td>
</tr>
<tr>
<td>Oral HPV infection</td>
<td>37</td>
<td>6</td>
<td>12</td>
<td>5.4-26</td>
</tr>
</tbody>
</table>

*Adjusted for age, gender, tobacco, alcohol, family history, and dental hygiene

## Measures of HPV 16-Associated Disease

<table>
<thead>
<tr>
<th>Measure</th>
<th>Cases (%)</th>
<th>Controls (%)</th>
<th>OR*</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPV 16 E6/E7 seropositive</td>
<td>64</td>
<td>4</td>
<td>58</td>
<td>24-138</td>
</tr>
<tr>
<td>HPV 16 DNA in tumor</td>
<td>72</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

*Adjusted for age, gender, tobacco, alcohol, family history, and dental hygiene.

### Sexual Behaviors and HNSCC

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Diagnosis of HPV-HNSCC (case-case)</th>
<th>Risk of HPV-HNSCC (case-control)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of sexual partners</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>History of oral-genital sex</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>History of oral-anal sex</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>History of genital warts/STD</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Young age at first intercourse</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

STD = sexually transmitted disease.

References:
### HPV 16 Exposure and HNSCC

<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Cancer type</th>
<th>Adj. OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schwartz S</td>
<td>1998</td>
<td>Oral</td>
<td>2.3</td>
<td>1.6-3.3</td>
</tr>
<tr>
<td>Herrero R</td>
<td>2003</td>
<td>Oropharynx</td>
<td>3.5</td>
<td>2.1-5.9</td>
</tr>
<tr>
<td>Smith EM</td>
<td>2007</td>
<td>All sites</td>
<td>1.7</td>
<td>1.1-2.6</td>
</tr>
<tr>
<td>Pintos J</td>
<td>2007</td>
<td>Tonsil</td>
<td>99.3</td>
<td>3.2-3090</td>
</tr>
<tr>
<td>Furniss CS</td>
<td>2007</td>
<td>All sites</td>
<td>4.0</td>
<td>2.8-5.7</td>
</tr>
<tr>
<td>D’Souza G</td>
<td>2007</td>
<td>Oropharynx</td>
<td>32.3</td>
<td>14.6-71.3</td>
</tr>
</tbody>
</table>
## Oral HPV and HNSCC

<table>
<thead>
<tr>
<th>Study</th>
<th>Cancer type</th>
<th>HPV type</th>
<th>Adj OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herrero</td>
<td>Oropharynx</td>
<td>Any</td>
<td>1.0</td>
<td>0.4-2.5</td>
</tr>
<tr>
<td>Schwartz</td>
<td>Oral</td>
<td>Any</td>
<td>0.9</td>
<td>0.5-1.6</td>
</tr>
<tr>
<td>Smith</td>
<td>All sites</td>
<td>High</td>
<td>2.6</td>
<td>1.5-4.2</td>
</tr>
<tr>
<td>Rosenquist</td>
<td>Oropharynx</td>
<td>High</td>
<td>63</td>
<td>14-280</td>
</tr>
<tr>
<td>Pintos J</td>
<td>Tonsil</td>
<td>High</td>
<td>18.4</td>
<td>2.2-154.5</td>
</tr>
<tr>
<td>D’Souza</td>
<td>Oropharynx</td>
<td>HPV16</td>
<td>14.6</td>
<td>6.3-36.6</td>
</tr>
</tbody>
</table>
## Tonsillar Cancer HPV Prevalence by Calendar Period, Swedish Cancer Registry

<table>
<thead>
<tr>
<th>Period</th>
<th>HPV Prevalence</th>
<th>Chi Square</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-1979</td>
<td>7 of 30, 23%</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>1980-1989</td>
<td>12 of 42, 28%</td>
<td>.79</td>
<td></td>
</tr>
<tr>
<td>1990-1999</td>
<td>48 of 84, 57%</td>
<td>.0025</td>
<td></td>
</tr>
<tr>
<td>2000-2002</td>
<td>32 of 47, 68%</td>
<td>&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

- HPV-positive head and neck cancer is a unique cancer entity increasing in incidence in the United States
- Exposure to sexually transmitted HPV 16 is main risk factor
- Profound effects on patient population, prevention, screening, and therapy for HNSCC
HPV

WHAT’S NEW IN ORAL CANCER DETECTION?

Presented by:
Janet Miller, RDH
SIGN OF ORAL CANCER

- A sore, irritation, lump or thick patch in the mouth, lip or throat
- A white or red patch in the mouth
- A feeling that something is caught in the throat
- Difficulty chewing or swallowing
- Difficulty moving the jaw or tongue
- Numbness in the tongue or other areas of the mouth
- Swelling of the jaw that causes dentures to fit poorly or become uncomfortable
- Pain in one ear without hearing loss
Most patients are finding Oral Cancer themselves!

- Oral cancer can frequently prosper without producing pain or symptoms the average patient might recognize.
- 62% of Oral Cancer is found by the patient in stage 3 or 4.
Incidence and Survival of Oral or Pharyngeal Cancer

- 30,000 new cases diagnosed yearly
- 8,000 deaths each year
- 5 year survival rate: 50%
Oral Cancer Risk Factors

- Risk Factors: TRADITIONAL • Tobacco use • Alcohol use • Exposure to sunlight • Age • Gender • Race
- NEWER • Oral HPV Infections • Younger population • Non tobacco use • Non excessive alcohol use
What is HPV?
(Human Papilloma Virus - Warts)

- Most common virus group in the world today affecting the skin and mucosal tissue
- Approximately 75% of the population is infected at some point
- Over 100 different types
  - HPV 16 and 18 – Most prominently linked to oral cancer
- Different types infect different parts of the body
- Most HPV's are common, harmless, and treatable
HPV related Oral, Head and Neck Cancer

Human Papillomavirus (HPV)
- Causes as many oral cancers as tobacco and alcohol
- Primary cause of cancers of the tonsils, lower tongue and upper throat
- HPV caused cancers of oral region has doubled since 1974
- HPV caused oral cancers will surpass those caused by alcohol and tobacco within the next 10 yrs.
- Possible transmission source: multiple sex partners, unwashed hands, sharing of saliva

HPV 16, 18 causes 95% of cervical cancers
HPV 16 found in 90% of HPV related oral cancers

Source: N England J Medicine; Oral Cancer Foundation, Johns Hopkins Oncology Center, Center for Disease Control, National Cancer Institute
The role of HPV in cancers of the head and neck is unquestioned:

- HPV is a risk factor for oral cancer, (in addition to tobacco & alcohol use)

- It is estimated that 50-65% of all oral cancers are associated with HPV lesions*

*www.oralcancerfoundation.org
leukoplakia on left buccal mucosa. However, the biopsy showed early squamous cell carcinoma. The lesion is suspicious because of the presence of nodules.
Who Should be Tested with an HPV Test?

- Patients who are sexually active (multiple sexual partners)
- Patients with a family history of oral cancer
- Patients with signs and symptoms of oral cancer
- Patients with traditional risk factors for oral cancer
- Patients with suspicious oral lesions
Emergent risk factors for oral cancer

Sexually Transmitted HPV

May represent the fastest growing oropharyngeal cancer population with a 5 fold increase in incidence under the age of 45

Means all patients over the age of 17 should be screened annually
Knowing the type of HPV is imperative.

HPV types are high, low and unknown risk, based on the likelihood of transforming cells

- Most HPV-associated oral lesions are HPV 16
- 1-855-ORALDNA
Oral Cancer Exam

Oral HPV Test Result

Positive test

Referral to ENT or Oral Surgeon
- Dental clinician and referral specialist jointly determine referral criteria

Follow-up Oral HPV Test
- To determine if the HPV infection is persistent or has been resolved
- Test interval timing coordinated between dental clinician and referral specialist

Negative test

Follow office protocol for oral lesion follow up (e.g. within 2 week interval to determine if lesion is still present and possible referral to specialist)*

Oral Cancer Risk Assessment:
- Family History Oral Cancer
- Tobacco Use
- Excessive Alcohol Use
- HPV Status (OraRisk® HPV test)

*For further information: www.cdc.org and http://oralcancerfoundation.org/
Extraoral Examination
Perioral and Intraoral Soft Tissue Examination: Lips
Perioral and Intraoral Soft Tissue Examination: Labial Mucosa
Perioral and Intraoral Soft Tissue Examination: Labial Mucosa
Perioral and Intraoral Soft Tissue Examination: Buccal Mucosa
Perioral and Intraoral Soft Tissue Examination: Buccal Mucosa
Perioral and Intraoral Soft Tissue Examination: Gingiva
Perioral and Intraoral Soft Tissue Examination: Dorsum of the Tongue
Perioral and Intraoral Soft Tissue Examination: Left Margin of the Tongue
Perioral and Intraoral Soft Tissue Examination: Right Margin of the Tongue
Perioral and Intraoral Soft Tissue Examination: Ventral Surface of the Tongue
Perioral and Intraoral Soft Tissue Examination: Floor of the Mouth
Perioral and Intraoral Soft Tissue Examination: Hard Palate
Perioral and Intraoral Soft Tissue Examination: Oropharynx
Perioral and Intraoral Soft Tissue Examination
References for Oral Cancer Information

- http://oralcancerfoundation.org/
- http://www.ada.org
- www.oraldna.com
- www.access-genetics.com
- Janet Miller, RDH jgmiller67@hotmail.com
Review: Risk factors for oral cancer

- Poor oral hygiene and tobacco use: smoking (cigarettes, cigars), chewing tobacco
- Alcohol ingestion: >2 drinks/day (men), >1 drink/day (women)
- As tobacco use has decreased, the number of HPV-related oropharyngeal cancers has increased
- Sites of HPV-related HNSCC: oropharynx, base of the tongue, lingual and palatine tonsils
- More men than women; more white men than black men
- Younger; more likely to be non-smokers/non-drinkers
- Incidence is related to the number of lifetime sexual partners
Can HPV vaccine(s) prevent oral cancer?

- HPV is found in 23-35% of all HNSCC biopsies worldwide

- HPV-16 is found in 68%-87% of HPV+ head and neck cancers

- Both current HPV vaccines address oncogenic HPV strains 16 and 18, and both approved for cervical cancer prevention

- HPV4 approved for both males and females
HPV vaccines~

- HPV4 currently approved for anal, vulvar and vaginal cancer prevention

- HPV4 (Gardasil™ by Merck) not yet approved to prevent penile or oropharyngeal cancers, but studies continue

- Once approval has occurred, patient education materials for the HPV vaccine(s) will include this information
HPV vaccination recommended

- Three-shot series (0, 2, and 6 months schedule)

- Optimum timing: entry into Middle School (age 11-12); given along w/ meningitis (MCV4) and tetanus, diphtheria and pertussis (Tdap) booster

- Vaccines against Hep A & B, flu, and varicella booster also recommended
HPV Vaccination Rates in Michigan
MCIR Data as of June 30, 2012
13-17 years of age

![Bar Chart](chart.png)
Patient education

- Parents: consider the HPV vaccine

- Promote regular and thorough oral hygiene

- Encourage regular (rather than episodic/urgent) dental exams

- No USPSTF recommendation for oral cancer screening, although most dentists recommend an oral exam during a routine dental visit to screen for oral cancer.

- Limit alcohol intake to <2 drinks/day (men) and <1 drink/day (women)
Patient education

- Avoid all tobacco use!

- Refer clients to Quit Line for assistance 1-800-784-8669
  - The Quit Line offers a personal health coach and participant toolkits to help tobacco users gain confidence and motivation they need to quit for good.
Questions?

Check the MPCA website at www.m pca.net under clinical services quality/hiv for links to resources from todays presentation.

For further information, please contact:
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drydahl@mpca.net