

## Lecture #4 – June 4, 2003

### Population, Screening, and Guidelines Dr. Kunzel

## Population, Screening, and Guidelines

- To be familiar with the term “screening”
- To recognize factors that make a disease appropriate for screening
- To recognize the attributes of a good screening test
- To assess oral ca as appropriate for screening
- To assess oral ca exams as appropriate for screening
- To consider the evidence base for oral ca screening
- To consider barriers to performing oral ca detection

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## Screening – a form of needs assessment

### Screenings –

- Procedures that sort out persons who may have a condition
  - from those who may not
- Those appearing to have the condition are followed up
  - to obtain a final diagnosis
  - & tx as necessary

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## Screening – a form of needs assessment

### ■ 3 types of screening

- 1. Population-based
  - Define a population
  - Endeavor to screen the entire population
- 2. Targeted population
  - Aim at a “high risk” segment of the population
  - Gender, age, behavior, health-related characteristic
- 3. Opportunistic population
  - Offer screening test for unsuspected disorder
  - At time when person presents to clinician for another reason

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## Screening – a form of needs assessment

- What do we screen for?
  - Presence of disease itself
  - A risk factor for disease (“do you smoke?”)

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## Screening – a form of needs assessment

### Dental Screenings

- *Cursory* oral inspections to provide *estimates* of oral health status
- Typically a dentist or dental hygienist inspects an individual’s mouth for *obvious* dental problems

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## Screening – a form of needs assessment

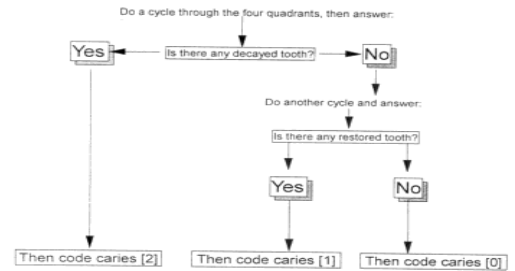
### Dental Screenings

- Oral inspections
  - can be done using tongue depressors
  - and a simple light source, such as flashlight

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FIGURE 1  
Visual Screening Algorithm for Coding Dental Caries



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## Screening - a form of needs assessment

### Dental Screenings

- Estimates urgency of need for dental treatment using specific criteria
- Most often use the ADA's criteria:
  - Apparently requires no dental tx
  - Requires tx but not of an urgent nature
  - Requires early treatment
  - Requires immediate treatment
- Must notify examinee (or parent) of conditions that require follow-up

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## Screening – a form of needs assessment

2 questions need to ask:

- What makes a *disease* or risk factor appropriate for screening?
- What are the attributes of a *good screening test*?  
(Frankenburg criteria)

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## Factors that make disease appropriate for screening

- the disease is *serious* (mortality, morbidity)
- the disease is *treatable* & accepted *intervention* exists
- early treatment is better* than late treatment
- the disease has a *pre-clinical detectable* period
- the disease is *prevalent* in a tested population

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## Attributes of good screening test

- high sensitivity - ability of the test to identify correctly those who have the disease
- high specificity - ability of the test to identify correctly those who do not have the disease
- low risk (to patient)
- inexpensive or cost effective
- tolerable or acceptable to the public

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## Attributes of good screening test

- *high sensitivity - ability of the test to identify correctly those who have the disease*
- *high specificity - ability of the test to identify correctly those who do not have the disease*
- Screenings - must evaluate against some standard procedure for validity
  - sensitivity, specificity
- Proportion false-positives and false negatives
  - important to patient follow-up and cost

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## (Not) attributes of good screening test

### Adverse consequences of screening

- Misdiagnosis - further tests must be taken if a false positive result obtained
- Labeling - costs associated with telling someone have a disease
- Reinforcement of bad habits among some

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## Attributes of good screening test

- *low risk (to patient)*
- *inexpensive or cost effective*
- *tolerable or acceptable to the public*

Because screenings are applied to *populations*

- their methods must be simple
- inexpensive
- require minimal training for application & interpretation

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## Attributes of good screening test

### Positive outcomes of screening

- Identification of high-risk groups for interventions –
  - it should be possible to differentiate those with the condition from those at borderline or without
- Improved prognosis for individual patients
- Reduced morbidity for cases treated early
- Reduced incidence of disease
- Reduced mortality

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## Early Oral Cancer Detection

Is oral cancer an appropriate target for screening?

### Oral Ca as appropriate for screening: Early tx better than late tx?

- Rationale for oral cancer based on facts:
  - Malignancies are asymptomatic and localized for a period
- Sometimes takes number of years to reach full invasive potential
  - making intervention with progression of an early lesion possible

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**Oral Ca as appropriate for screening:**  
Has a pre-clinical detectable period?

- Often preceded by potentially malignant lesions/ conditions such as leukoplakia, erythroplakia, and submucous fibrosis
- Major sites of occurrence readily accessible to examination

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**Oral Ca as appropriate for screening:**  
The disease is serious (mortality, morbidity)?  
Early tx better than late tx?

- Oral cancer has one of the lowest five-year survival rates (52%)
  - 5-year survival rate for advanced cases is 19 %
  - vs. 78 % for localized lesions
- When detected early, prognosis for survival better than for many other cancers

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**Oral Ca as appropriate for screening:**  
The disease is serious (mortality, morbidity)?

- Morbidity:
- Consequences of advanced oral cancers:
  - Chronic pain
  - Loss of function
  - Social disfigurement
- Sequelae often result in:
  - cosmetic/psychological insult
  - social isolation

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**Oral Ca as appropriate for screening:**  
The disease is serious (mortality, morbidity)?  
The disease is prevalent in a tested population?

- Mortality:
- Annually approximately 30,000 Americans are diagnosed with oral cancers
    - 1995 - 28,000 new cases
    - 1995 - 8,400 deaths
  - Incidence greater than leukemia,
    - Hodgkin's disease
    - cancer of the brain, liver, bone
    - thyroid gland, stomach, or cervix

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**Oral Ca as appropriate for screening:**  
The disease is prevalent in a tested population?

- **In the west, incidence is relatively low**
  - Largest study group was over 23,000 adults > age 30 in MN
  - Mouths examined between 1957 and 1972
  - More than 10% of the screened had an oral lesion
  - But were mostly benign:
    - precancer encountered in 2.9%
    - cancer in less than 0.1%

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**Oral Ca as appropriate for screening:**  
The disease is prevalent in a tested population?

- Annual incidence of oral cancer in the U.S.:
  - 11/100,000 population
  - with a male/female ratio greater than 2:1
- Responsible for 2% of all cancer deaths in the U.S.

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Is an oral cancer examination a  
“good” screening test?

## Oral Ca exam as appropriate for screening

Principal screening test for oral cancer in  
asymptomatic persons

- Involves visual exam of oral cavity and extraoral areas using a dental mirror
- Retracting tongue with a gauze pad to view hard-to-see areas
- Also digital palpation with a gloved hand for masses

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## Oral Ca exam as appropriate for screening

Low risk to patient?  
Tolerable or acceptable to the public?  
Inexpensive or cost effective?

- Screening examination is inexpensive, safe
- Noninvasive, quick, well tolerated
- Recently published results  
large multicenter double-blind study suggest the potential efficacy of using the oral brush biopsy to increase detection of early stage oral cancer and precancerous lesions assuming dentists provide complete oral cancer exams on regular basis

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## Oral Ca exam as appropriate for screening

Inexpensive or cost effective?

*Insufficient evidence of cost effectiveness*

In high incidence part of the world:

- Substantial proportion of suspicious lesions found (2-16% in south Asia)
- But compliance of patients to attend follow up was poor

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## Oral Ca exam as appropriate for screening

Inexpensive or cost effective?

**Screenings – patient compliance very impt**

- Procedures that sort out persons who may have a condition
  - from those who may not
- **Those appearing to have the condition must be followed up**
  - to obtain a final diagnosis
  - & tx as necessary

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## Oral Ca exam as appropriate for screening

Inexpensive or cost effective?

■ **Stronger case can be made for *targeting* screening to “at risk” populations**

- smokers
- heavy drinkers > age of 40
- But still problems of attendance at initial exam (patient compliance)
- plus low disease prevalence
- make this of uncertain utility

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## Oral Ca exam as appropriate for screening Inexpensive or cost effective?

### Some evidence for effectiveness of opportunistic screening

- Oral Cancer Case Finding Program in Cuba
  - Between 1983 and 1990, 10,167,999 patients were screened when they attended clinics
  - only 27% with suspect lesions complied with referral
  - of these, 3220 potentially malignant lesions
  - 581 squamous cell carcinomas
  - 127 other malignancies

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## Oral Ca exam as appropriate for screening Inexpensive or cost effective?

### Some evidence for effectiveness of opportunistic screening

#### Oral Cancer Case Finding Program in Cuba (cont.)

- Program was shown to be effective:
  - “downstaging” of cancers seen:
  - Stage I lesions rising from 22.8% to 48.2%
  - Stage II, III, and IV lesions falling from 77.2% to 51.8%

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## Evidence base for oral ca screening

### Exam validity – its ability to differentiate:

- those with the condition from those at borderline or without

### Patient outcomes

- Improved prognosis for individual patients
- Reduced morbidity for cases treated early
- Reduced incidence of disease
- Reduced mortality

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## Evidence base for oral cancer screening

*Population* screening for oral ca cannot be recommended because: *lack evidence of its validity:*

Principal screening test in asymptomatic persons is inspection and palpation of the oral cavity

- Its sensitivity is unknown
- Little information on the frequency of false positives

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## Evidence base for oral cancer screening

*Population* screening for oral ca cannot be recommended because: *lack evidence of its effectiveness:*

No controlled trials of screening for oral cancer that include data on clinical outcomes

- *Consistent evidence that persons with early-stage oral cancer have a better prognosis than those diagnosed with more advanced disease*

But may be due to possible effects of lead-time and length bias

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## Evidence base for oral cancer screening

### Lead-time bias

Survival can appear to be lengthened:

- when screening simply advances earlier the time of diagnosis,
- lengthening the period of time between dx and death
- without any true prolongation of life

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## Evidence base for oral cancer screening

### Length bias

- Tendency of screening to detect a disproportionate # of cases of slowly progressive disease
  - and to miss aggressive cases that, by virtue of rapid progression, are present in the population only briefly
- Aggressive malignancies will be under-represented in the cases found

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## Evidence base for oc screening

### Clinical Practice Guidelines

#### Report of the U.S. Preventive Services Task Force, 2nd ed., 1996:

- *Insufficient evidence to recommend for or against* routine screening of asymptomatic persons for oral ca by primary care clinicians.
- Although direct evidence lacking, clinicians may wish to include an exam for oral ca in the periodic health exam of persons who chew or smoke tobacco, older persons who drink regularly, anyone with suspicious symptoms

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## Evidence base for oc screening

### Clinical Practice Guidelines

#### Report of the U.S. Preventive Services Task Force, 2nd ed., 1996 (cont.)

- All patients, especially those at increased risk...
- should be advised to receive a complete dental examination on a regular basis.

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## Evidence base for oc screening

### Clinical Practice Guidelines

#### Report of the U.S. Preventive Services Task Force, 2nd ed., 1996 (cont.)

- Routine oral exam by primary care clinicians
  - Level of evidence: III
  - Strength of recommendation: C

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## Evidence base for oc screening

### Clinical Practice Guidelines

#### Report of the U.S. Preventive Services Task Force, 2nd ed., 1996 (cont.)

- I: Evidence from at least 1 properly randomized controlled trial
- II-1: ...from well-designed controlled trials w/o randomization
- II-2: ...from well-designed cohort or case-control analytic studies from >1 research grp
- II-3: ...from multiple time series w/ or w/o the intervention (dramatic results, e.g., penicillin)
- III: *Experts, experience, case reports*

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## Evidence base for oc screening

### Clinical Practice Guidelines

#### Report of the U.S. Preventive Services Task Force, 2nd ed., 1996 (cont.)

- A: *Good evidence* to support the rec that condition be considered in periodic hlth exam
- B: *Fair evidence* to support rec that be specifically considered
- C: *Insufficient evidence to rec for or against the inclusion of the condition, but rec may be made on other grounds*
- D: *Fair evidence* to support the rec that be excluded
- E: *Good evidence* to support the rec that be excluded

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## Evidence base for oc screening

Clinical Practice Guidelines

### American Cancer Society

- Recommends a cancer checkup
- that includes oral exam every 3 years for persons over 20
- and annually for those over age 40

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## Evidence base for oc screening

Clinical Practice Guidelines

### Canadian Task Force on Periodic Health Examination

- Concluded was insufficient evidence to include/ exclude screening of oral ca
  - in periodic health exams
  - of persons in the general population
- but suggested
  - annual oral exam
  - for persons over 60 at risk

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## Evidence base for oc screening

Clinical Practice Guidelines

- Logically such examinations dentists are providers of choice to perform
- But is need for other health care providers to assume more responsibility

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## Population, Screening, and Guidelines

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Barriers to early oral cancer detection - how to confront?

## To consider barriers to performing oral ca detection

- A review of several studies assessing oral cancer knowledge, opinions, and practices suggests:
  - many MDs and DDS do not detect oral lesions in their early stages
  - because of inappropriate attitudes or lack of knowledge

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### To consider barriers to performing oral ca detection

- A recent pilot survey of MD and DDS' knowl, opinions, practices-
- Found that 34% of DDS and 37% of MDs did not recognize the importance of early detection as means of reducing morbidity and mortality from these diseases

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### To consider barriers to performing oral ca detection

- Studies report MDs do not routinely inspect their pts to identify early, suspicious oral lesions
- 77% of pts first diagnosed with oral ca at an advanced stage under the routine care of a MD within past 3-24 months
- Another study - 94% of pts with advanced oral ca seen by a MD within 1 year of dx

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### To consider barriers to performing oral ca detection

DDS also remiss in early dx and referral for oral cancer

- Reported that 14% of DDS performed all aspects of an intraoral exam

Studies span 3 decades, yet results unchanged

- DDS missed approx twice as many asymptomatic oral ca as they found
- Failed to recognize oral ca in 69% of cases presented to them

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