National Coalition Consensus Conference: Oral Health of Vulnerable Older Adults and Persons with Disabilities
MEDICAL CONSIDERATIONS IN THE ORAL HEALTH OF OLDER ADULTS AND PERSONS WITH DISABILITIES

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MEDICAL CONSIDERATIONS IN THE ORAL HEALTH OF OLDER ADULTS AND PERSONS WITH DISABILITIES

Introduction
Burden of oral diseases
Oral systemic linkages
Prevention and cost savings
Concluding remarks
Everyone deserves a healthy smile!

Special efforts are needed for those most vulnerable
Whole mouth health is closely linked to whole body health.
Introduction

Burden of oral diseases
Seniors Oral Health Care - Nothing to Smile About!

“Elderly suffer a disproportionate & debilitating amount of oral disease”

Alliance for Aging Research
Oral health domains

Pathology
- Dental caries
- Periodontitis
- Oral cancer

Function
- Chewing
- Speaking

Esthetics
- Self esteem
- Social interactions

Symptoms
- Dry mouth
- Pain
Plaque (biofilms) responsible for most oral-related problems
Untreated dental caries in older adults

MA Department of Public Health Study, July 2010

Percentage

- urgent
- major
- early

meal site elderly
nursing home elderly
Consequences of dental infections

- Extreme tooth pain
- Bacteremia
- Facial cellulitis
- Brain abscess
- Airway compromise
Moderate to Severe Periodontal Disease Prevalence in the US: NHANES (1999-2004) + 50% (?

Higher prevalence: males, non-hisp blacks, low SES

http://jdr.sagepub.com/content/89/11/1208.abstract  (Ekes P)
Oral Cancer – Sobering Facts

1. Kills an American every hour
2. 3x more victims than cervical cancer
3. Claims more lives than leukemia, Hodgkin’s lymphoma, laryngeal ca, testicular ca, thyroid ca, or skin ca (melanoma)
4. Detected late - 22% survive; early – > 80%
5. Smokers & drinkers – 15 times greater risk
6. Minorities have greater risk; esp Af-Am males

http://www.oralcancerfoundation.org/facts/index.htm
Oral cancer's toll cruel

By Madison Park, CNN
February 19, 2010 11:05 a.m. EST
Chewing dysfunction cascade

Caries and Periodontal Disease

Tooth Loss

Chewing Problems
Chewing problems common

- One third of all elderly have “difficulty chewing or biting some foods”
  - 75% of edentulous elderly
- 20 + teeth needed for good nutrition

M Inukai et al, *Health and Quality of Life Outcomes* 2010,
Impact of Malnourishment

→ 3 times longer length of hospitalization

→ 3 times higher risk of infection

→ More dependence in activities of daily living (ADLs)

Low levels of vitamin E, B\textsubscript{12} and D have been associated with a decline in functional mobility
Mouth dryness

~ 30% of elderly have xerostomia
Chronic mouth dryness limits:

- Maintenance of neutral oral pH
- Ongoing remineralization
- Protective coating on mucosa & teeth
- Lubrication for chewing, swallowing, & talking
- Local antimicrobial action through enzymes, immunoglobulin A & histatins
- Solvent role for enhancing taste
Oral discomfort can be extreme

Periapical abscesses  Fungal infections  Burning mouth syndrome
"Cosmetic dentistry changed my life."
The Importance of a Smile

- Social engagement
- Self esteem
- Mental health
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Oral systemic linkages
A promise for living longer?!

“… flossing your teeth ranks right up there with… quitting smoking and reducing stress as one of the top five things you can do … keeping your teeth and gums healthy allows you to add 6.4 years to your life.”
Links between oral & general health

Caveats on “causation”

common risk factors
Oral-Systemic Connection “Caveats”

“The burden of proof of a causal relationship is not yet met, but research is ongoing and it looks promising.”

Daniel Meyer, ADA Division of Science

Scientific American: *Oral and Whole Body Health* October 2006
“Have inflammation, will travel”

Scientific American:  Oral and Whole Body Health - October 2006

IT’S ‘PERIO-SYSTEMIC LINK’;
‘Oral-Systemic Link’ Is a Misnomer

RICHARD T. KAO, DDS, PHD

During the past five years, there has been a plethora of publications touting the importance of how inflammation in the mouth may be linked to systemic health and disease. Some of these articles have labeled this link as the oral-systemic link. In this issue, the case is argued that these interactions should more appropriately be labeled as the perio-systemic link.

R. Kao, CDA Journal April 2010

HAVE INFECTION, WILL TRAVEL: Bacteria from dental plaque as enter the bloodstream through small ulcers in the gum and can then travel throughout the body. The increase in hormonal activity during pregnancy can cause gums to bleed more easily and promote bacterial overgrowth.
Inflammation plays an increasingly recognized role in oral-systemic interaction.

Circulating inflammatory mediators

fatty acids, interleukin 1, and tumor necrosis factor alpha

Alan B. Douglass
Oral health/systemic health research

- Diabetes type 2
- Cardiovascular disease: MI, stroke, htn, vhd, pvd
- Respiratory disease: Pneumonia, VAP, lung abscess, COPD
- Cognitive impairments
- Cancer
- Chronic kidney disease
- Metabolic Syndrome (obesity)
- Prostate disease
- Crohn’s disease
- Gastroesophageal reflux
- Systemic septicemia
- Premature underweight births
- Anemia
Inflammation

Macrophages

Neutrophils

Toxins

Anaerobic bacteria in plaque

Circulating inflammatory mediators

fatty acids, interleukin 1, and tumor necrosis factor alpha

Acute phase proteins

CRP, SAA, IL6, TNF alpha

Liver and pancreas insulin resistance

Diabetes

Alan B. Douglass (modified)
Diabetes in older adults

- > 20% of 60+ yr olds (40% - impaired glucose tolerance)
- One half treated with insulin or oral agent
- Only 50% reach goal of HbA1c<7%
- Obese Afr-Am & Hispanics at increased risk
- One of the costliest conditions to treat
Diabetes and Periodontal Disease

• “Sixth” complication of diabetes CVD, kidney, neuropathy, retinopathy, foot/skin
• Poorly controlled (HbA1c >9) 3x more likely to have severe pd
• 1/3 of diabetics have severe pd (attachment loss of 5+ mm).
• Most complications in most “vulnerable”
Poor Glycemic Control – Oral Impact

- Periodontal disease
- Dry mouth
- Oral infections
- Poor wound healing
- Burning mouth syndrome
- Dental caries
- Candidiasis & Cheilitis
- Salivary gland enlargement
“A 20 year Columbia University study tracked over 9,000 people without diabetes. Those with elevated levels of periodontal disease were twice as likely to develop Type 2 diabetes due to chronic inflammation.”

Endocrine Today
Vol 6, Number 20, November 2008
Periodontal disease, diabetes, and obesity – a 3 way street

A triangular relationship: Obesity can increase infections, such as periodontal disease, cytokines produced by fat cells are known to trigger insulin resistance, which can lead to type 2 diabetes. Diabetes, in turn, is known to increase the risk for periodontal disease. New research suggests that periodontal disease can affect a diabetic patient’s ability to control blood sugar levels.

Scientific American:  Oral and Whole Body Health - October 2006
Cochrane review findings

“Results are in favour of a significant effect of periodontal therapy in reducing HbA1c levels … might translate into an important public health benefit, given the high prevalence of periodontitis on the one hand, and the mortality, morbidity and cost of diabetes on the other.”

Jean-Noel Vergnes, EBD Sept 2010
Heart Health in the Inflammation Age
Inflammation

Macrophages
Neutrophils
Toxins
Anaerobic bacteria in plaque

Circulating inflammatory mediators

fatty acids, interleukin 1, and tumor necrosis factor alpha

Acute phase proteins
CRP, SAA, IL-6, TNF alpha

Heart and blood vessels
endothelial injury
lipid deposition
monocyte migration
smooth muscle proliferation

Atherosclerosis
Cardiovascular disease
Stroke

Alan B. Douglass (modified)
Periodontal disease is a risk factor or marker for CHD that is independent of traditional CHD risk factors, including socioeconomic status. Various measures of periodontal disease confer approximately a 24–35% increase in risk of CHD.

Impact of toothbrushing on cardiovascular disease

Poor oral hygiene is associated with higher levels of risk of cardiovascular disease and low grade inflammation.

Increased risk of a cardiovascular disease event (hazard ratio 1.7, 95% CI 1.3 to 2.3) in a fully increased concentrations of both C reactive protein and fibrinogen.

Can poor oral health predispose high risk patients to oral colonization by respiratory pathogens?

Respiratory infection depends on aspiration of pathogens from proximal sites into the respiratory tree.
good evidence that improved oral hygiene and frequent professional oral healthcare reduces the progression or occurrence of respiratory diseases in high-risk elderly adults (relative risk reduction of 34–83%).

Systematic review finds positive preventive effects of oral care

“… providing mechanical oral hygiene may prevent ~1 in 10 deaths from pneumonia in dependent elderly people and show similar pneumonia prevention effect.”

15 publications (5 were RCT). All revealed positive preventive effects of oral care on pneumonia or respiratory tract infection in nursing home residents.

Sjogren P, et al: JAGS 2008 (56); 2124-30
“Some reservations must be expressed about this conclusion …”

“… desirable for practice guidelines … for institutionalized seniors to include specific oral hygiene interventions.”

Sophie Arpin, EBD, 2009; Vol 10(2)
Tooth loss and cognitive status

A low number of teeth increased the risk of higher prevalence and incidence of dementia (2-4x).

Edentulism or very few teeth (1-9) may be predictors of dementia in late life.

Pamela Sparks Stein, et al, JADA, 2007;138;1314-1322
Recent Study Finds Dose Dependent Links

**CONCLUSION**

This fairly large, prospective study with a long follow-up period presents for the first time a dose-dependent relationship among NT and both all-cause and CVD mortality, indicating a link between oral health and CVD, and that the NT is a proper indicator for oral health in this respect.

**Number of Teeth as a Predictor of Cardiovascular Mortality in a Cohort of 7,674 Subjects Followed for 12 Years**

Anders Holmlund, Gunnar Holm, and Lars Lind

Holmlund A, J Periodontol • June 2010
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Prevention & Medical Costs

• Cost savings from prevention or early tx of dental diseases is higher than from HIV screenings or influenza immunization

  Allareddy V, J Am Dent Assoc 2010;41:1107-1116

• Oral cancer tx costs – 60% lower if found earlier


• Improving oral health saved >$4 billion in tx costs

Prevention & Medical Costs


- Severe perio disease added 21% cumulative cost for medical care; .. those with no pathologic pockets had 75% yrly costs \((4,000 \text{ Japanese, prospective sd, 2007})\) R. Ide, J Periodontol. 2007 Nov;78 (11)

Prevention & Medical Costs

- Brushing of teeth (bid) of ventilated patients – risk of pneumonia reduced by 46% - likely saved $140,000 to $560,000 in hospital costs.

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In summary

• Profound disparities in oral health (and access) to care exist for all ages … especially vulnerable elderly and persons with disabilities

• Oral disease can severely affect systemic health and impair quality of life

• Much oral disease is preventable or at least controllable; substantial medical cost savings are possible
“...too many people outside the oral health community are uninformed about, misinformed about, or simply not interested in oral health.”

U.S. Surgeon General
Translating knowledge into solutions

• Need a broadly-based and energized coalition to advocate for improved oral health for those most vulnerable.

• Need epidemiological research on oral-general health links (risk factors) and operational public health research.

• Build oral health systems capacity based on age & disability friendly primary health care

• Improve & integrate health promotion/disease prevention efforts.

• Improve health insurance coverage

Adapted from: *Oral health in ageing societies*; WHO, 2006
Whole mouth health is closely linked to whole body health.