

# Smiles for Life

*A national oral health curriculum*

## Module 1: The Relationship of Oral to Systemic Health





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## Educational Objectives

- Discuss the prevalence and sequelae (resulting conditions or consequences) of oral disease
- Recognize the interrelationships between oral and systemic disease
- Highlight the role of the community health worker in promoting oral health
- Understand the concepts of interprofessional education and collaborative practice
- Consider how collaborative practice can increase provision of comprehensive oral health services

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# Prevalence and Consequences of Oral Disease

## Chapter Objective

- Discuss the prevalence and sequelae (related conditions or consequences) of oral disease

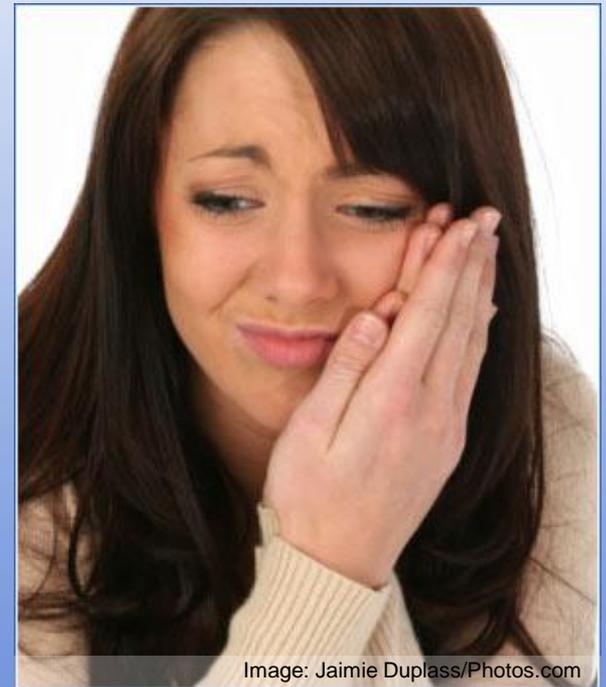


Image: Jaimie Duplass/Photos.com

“You are not healthy without good oral health...”  
-David Satcher, MD, 16<sup>th</sup> Surgeon General

## Surgeon General's Report on Oral Health

- Dental care is the most common unmet health need
- Oral disease can severely affect systemic health
- Much oral disease is preventable or at least controllable
- Profound disparities in oral health and access to care exist for all ages
- Interdisciplinary care is necessary to achieve optimal oral and general health

# Prevalence

- Dental caries is the most common chronic disease of childhood
  - 5 times more common than Asthma
  - Affects 50% of low-income children
- Severe gum disease affects 47% of U.S. Adults
- 70,000 oral cancers diagnosed annually
  - Oral cancer causes 14,000 deaths a year
  - Diagnosis is often late



Photo: Steven Lepowsky, DDS



Photo: Robert Henry, DMD, MPH

## Consider the following

- Though most patients have a medical home, many lack a dental home
- Children are 2.5 times more likely to lack dental coverage than medical coverage
- Dentists per capita are declining, especially those that accept Medicaid
- Dentists are often not comfortable with special populations, such as young children, pregnant women, or adults with special needs
- 90% of physicians think oral health should be addressed at well visits, yet surveys show:
  - 50% had little or no oral health training
  - Only 9% could answer 4 simple oral health questions correctly
  - Clinicians averaged less than 2 hours of oral health training

# The Consequences

## Oral pain can cause:

- Poor school performance in children
- Work loss in adults
- Difficulty chewing and inadequate nutrition
- Costly emergency department visits



Photo: Donald Greiner, DDS, MS

## Dental decay and tooth loss can lead to:

- Aesthetics and self-image issue
- Speech and language development problems
- Costly restorations



Photo: ICOHP



# Interrelationships Between Oral and Systemic Health and Disease

## Chapter Objective

- Recognize the interrelationships between oral and systemic disease

## Tobacco users may develop

- Lung and oral cancer
- Periodontal (gum) disease (even among teenage smokers)

## Alcohol users may develop

- Liver disease
- Oral cancer

## Drug users may develop

- Blood borne infections
- Poor hygiene
- Gross Caries (e.g., meth mouth)

**Meth Mouth**



Photo: James Cecil, DMD, MPH

**Leukoplakia (thick, white/gray patches)**



Photo: Brad Neville, DDS

# The Role of Nutrition

- Frequent ingestion of simple sugars contributes not only to obesity, but also to dental caries
- Poorly aligned teeth, chewing problems due to missing or misaligned teeth, and dental pain interfere with eating
- Children, special needs patients, and the elderly are particularly vulnerable and have few reserves when nutritionally deprived
- Elderly may experience Failure-to-Thrive (insufficient weight gain or inappropriate weight loss) due to poor fitting dentures
- Early Childhood Caries (ECC) has been linked to Failure-to-Thrive in some patients
- Nutritional supplements used to treat Failure-to-Thrive may exacerbate ECC

## **Xerostomia (Dry Mouth)**

- Decreased saliva flow results in dry mouth which promotes caries and periodontal disease
- Many commonly prescribed medications produce xerostomia, including steroids, antihistamines, diuretics, antihypertensives, anticholinergics, and antidepressants

**Many additional classes of medications can have adverse intraoral effects, as well.**

# Competing Medical Issues

- Special needs patients often have multiple medical issues, and dental care may not be given the priority it deserves
- Caregivers may be overwhelmed with care needs and deemphasize oral care without realizing its importance to overall health
- Financial limitations may force patients and families to choose between systemic and oral health care
- Modified diets and feeding methods may increase caries risk
- Primary care clinicians may forget to ask about oral health if multiple medical problems are competing for attention
- Oral hygiene and dental care can be physically challenging for those with Parkinson's Disease, arthritis, or autism

## Untreated oral infection can spread and cause

- Intraoral abscesses
- Sinusitis
- Facial cellulitis
- Periorbital cellulitis
- Bacteremia and sepsis
- Brain abscesses
- Airway compromise secondary to tracking of cellulitis into fascial planes of the neck



Photo: ICOHP

# Aspiration Pneumonia

- Aspiration of oral bacteria is associated with pneumonia, particularly in bedridden and hospitalized patients
- 83% percent of patients who develop nosocomial (originating in hospital) pneumonias are mechanically ventilated
- Oral care interventions led to a 90% reduction in ventilator associated pneumonia

Inflammation plays an increasingly recognized role in oral-systemic interactions.

- Inflammation constitutes a major mechanism for the observed link between oral disease, specifically periodontitis, and several systemic diseases, although direct cause-and-effect is difficult to establish
- There is strong evidence for a causal link between periodontal disease and diabetes
- There is emerging evidence for other conditions including
  - Obesity
  - Coronary artery disease
  - Metabolic syndrome
  - Oral health after menopause
  - Helicobacter pylori
  - Adverse pregnancy outcomes

## **The oral-systemic link between obesity and oral disease is intimately tied up with diabetes in a “3-way street.”**

- Fat tissue is a metabolically active organ that produces the cytokines tumor necrosis factor alpha (TNF  $\alpha$ ) and interleukin 6
- These cytokines promote bone breakdown and inflammation, two processes that potentiate periodontal disease
- TNF  $\alpha$  also causes insulin resistance that predisposes to Type 2 Diabetes
- Poor glycemic control is associated with periodontal disease
- Periodontal disease worsens glycemic control creating a vicious cycle

**Periodontal disease is associated with coronary artery disease and cerebrovascular disease, though the impact is unclear.**

- Studies support an association between periodontitis and atherosclerotic vascular disease, but not a causative relationship.
- Inflammatory proteins that cause blocked arteries are produced in gum disease.
- Smoking is associated with both periodontitis and coronary heart disease.
- Both share elevated C-reactive protein (CRP) levels.
- Treatment of periodontal disease has not been shown to reduce cardiovascular risk.

## Oral health is important for peri- and post-menopausal women

- The incidence of Periodontitis increases after menopause
- Hormone replacement therapy appears to be protective
- Community Health Workers should educate peri- and post-menopausal women about maintaining good oral hygiene



Image: Jupiter Images/Photos.com

**Helicobacter Pylori infection is a causative agent of gastritis and peptic ulcers and a risk factor for gastric cancer**

- H. Pylori has been found in dental plaque
- Strong correlation between recurring H. Pylori in the mouth and stomach infections
- Plaque control has been found to significantly decrease the prevalence of H. Pylori in the stomach
- In patients with recurrent H. Pylori, plaque control may reduce the risk of re-infection

## **Numerous studies associate Periodontitis with preterm birth (PTB) and low birth weight (LBW)**

- Association between periodontitis and PTB and LBW is biologically plausible
- Periodontal treatment is safe in pregnancy
- Treatment improved Periodontitis and women felt better
- No adverse prenatal outcomes occurred in any studies
- Treatment did not change outcomes in three large U.S. based NIH funded randomized controlled trials

## **Preeclampsia (pregnancy complication with high blood pressure and potential organ damage)**

- Women with Periodontitis were twice as likely to develop preeclampsia

- Loss of a large number of teeth negatively affects overall health and is an important public health issue
- Complete edentulism prior to age 65 is associated with 1.5 times increased risk of death from all causes

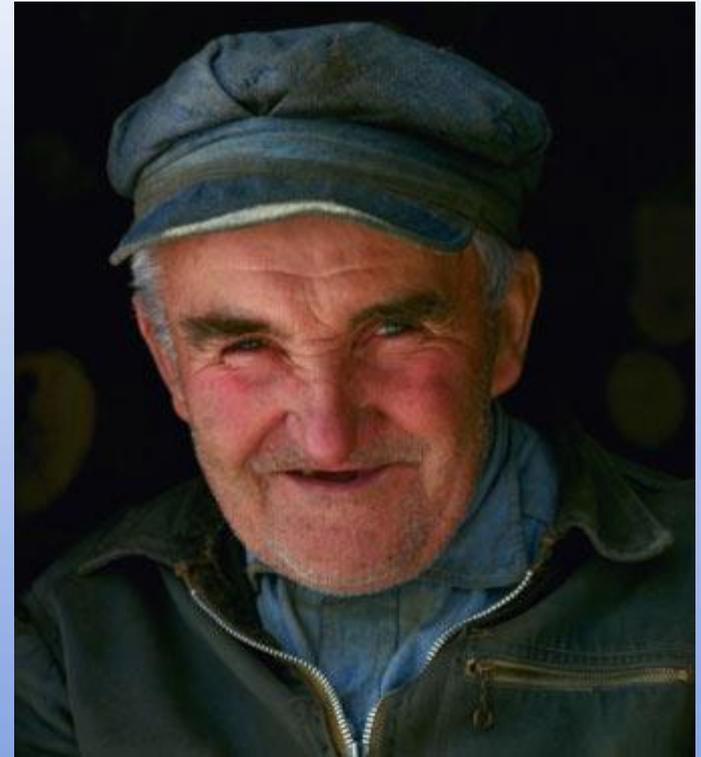


Image: Punchstock



## Role of the CHW

### Chapter Objectives

- Highlight the role of the CHW in promoting oral health
- Understand the concepts of interprofessional education and collaborative practice
- Consider how collaborative practice can increase provision of comprehensive oral health services



Image: Alexander Rath/Photos.com

Smiles for Life courses on oral examination, infant oral health, adult oral health, oral health in pregnancy, caries risk assessment, and geriatric oral health cover those topics in detail.

## Topics to Be Addressed

- Education about disease and risk
- Anticipatory guidance
  - Caries
  - Oral health maintenance
  - Early referral
  - Fluoride promotion



Photo: Joanna Douglass, BDS, DDS

## The Medical Home is ideal for:

- Monitoring medical conditions such as diabetes which affects both oral and systemic health
- Evaluating and initially managing oral emergencies
- Applying fluoride varnish for prevention of caries, particularly in locations where dental services are not available



Photo: ICOHP

## Common areas of collaboration with dentists

- Medically complicated patients
- Anticoagulation
- Antibiotic prophylaxis
- Referrals for routine and emergency care

## Community Health Workers can promote

- Improved access to care
- Prevention of oral disease
- Community water fluoridation
- Safety and injury prevention

## Many areas lack access to dentists

### Community Health Workers can

- Educate patient to promote oral health
- Facilitate appropriate referrals for screening and treatment
- Intervene early with pregnant patients and infants
- Collaborate with schools, Head Start, and health providers promoting oral health in their community

# Working With Other Professions

- Oral health is the responsibility of many health professionals
- Collaborative practice = Health care providers from different professional backgrounds work with patients, their families, other care providers and communities to deliver comprehensive, high quality of care
- Interprofessional education around oral health is necessary to prepare for collaborative practice

# Interprofessional Education

- **Interprofessional education:** students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes



Image adapted with permission from the World Health Organization, 2010.

# Collaborative Practice

- **Collaborative Practice:** Health workers from different professional backgrounds provide comprehensive services by working with patients, families, care providers and communities to deliver the highest quality care



Image adapted with permission from the World Health Organization, 2010.

# Collaborative Practice:

Collaborative practice can improve:

- Access to and coordination of health services
- Health outcomes for people with chronic disease
- Patient care and safety

Collaborative practice can decrease:

- Total patient complications
- Hospital admissions and length of hospital stay
- Tension and conflict among caregivers
- Staff turnover
- Clinical error rates and mortality rates
- Redundant medical testing and associated costs

# Interprofessional Competency Domains

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## Values/Ethics

Maintain a climate of mutual respect and shared values

## Roles/Responsibilities

Use knowledge of one's own and other professions to address healthcare needs

## Communication

Communicate in a manner that supports a team approach to healthcare

## Teams and Teamwork

Apply relationship-building values and principles of team dynamics to perform effectively as a member of the healthcare team

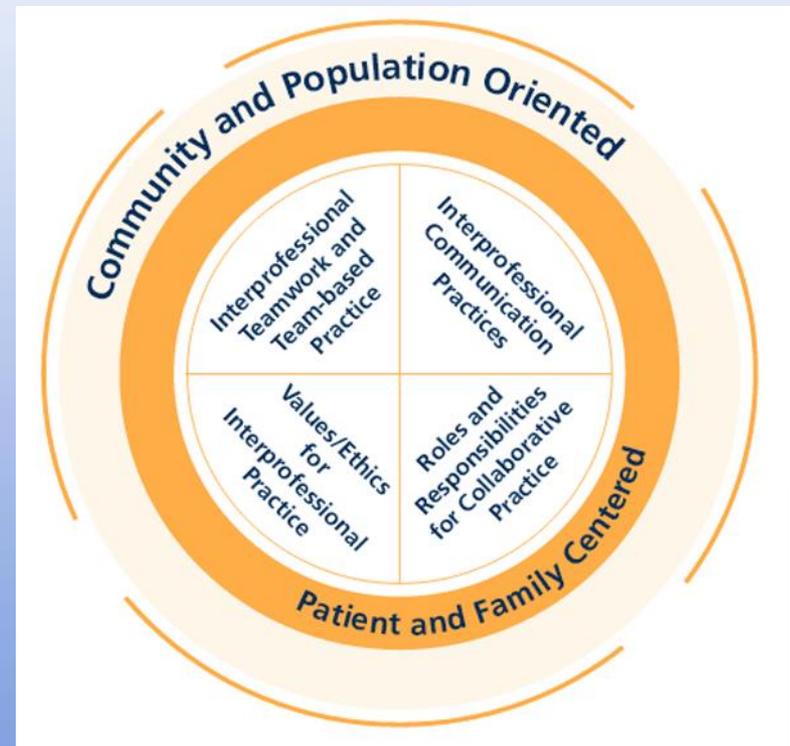


Image: Interprofessional Education Collaborative Expert Panel, 2011



## Take Home Messages

- Oral disease is prevalent throughout the life cycle
- Oral and systemic health are closely interrelated
- Much oral disease can be prevented through appropriate diet and good oral hygiene
- Community Health Workers can have an impact on the oral health of individuals and communities
- Collaborative practice can provide comprehensive services by working with patients, their families, care providers and communities to deliver the highest quality of care



## Questions?



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