

Dental Recommendations for Preventing Complications in Patients with Chronic Conditions

Health Partners Research Foundation eDent Study

Introduction

Health Partners Research Foundation (HPRF) has recently received a grant from The Agency for Health Research and Quality to improve quality and safety of dental care for patients with chronic illness. This project hopes to improve patient outcomes by increasing HealthPartner dentists awareness and clinical decision-making for patients with chronic conditions by identifying problems and providing the dental recommendations. The study will evaluate the effectiveness of simple alert reminders to the dentist and/or patient that special dental care is needed because of the presence of a chronic condition to reduce complications during care. The patient’s electronic medical record will be used to identify patients with chronic illnesses. The project will utilize the electronic dental record to provide an alert and information to dentists and a personal health record to provide an alert and information to patients about their condition. The four chronic conditions include congestive heart failure, chronic obstructive pulmonary disease, diabetes mellitus, conditions or medications causing xerostomia.

I. Congestive heart failure (CHF) represents a symptom complex that can be caused by a number of specific disease processes. The three most common causes of CHF are hypertensive disease (the dominant cause, preceding cardiac failure in 75% of cases), cardiac valvular disease, coronary atherosclerotic heart disease and its complications. Other causes include thyrotoxicosis, rheumatic fever, congenital heart disease, severe anemia, chronic obstructive lung disease, and pulmonary hypertension.<sup>1-3</sup> Congestive heart failure is one of the most common causes of death in the U.S.<sup>1,4-5</sup> Of the over 2 million Americans with CHF, 50% will die within 5 years. Patients with CHF need special attention during dental care including avoiding procedures that can strain the heart, use of adequate pain control, monitoring blood pressure, shortened visits, and a cautious eye to possible complications. They also need special attention regarding preventing oral infections and periodontal disease that may contribute to further cardiac problems.

Table 1. Recommendations for Dental Patients with Congestive Heart Failure			
Potential Problems Related to Dental Care	Oral Manifestations	Assessment for Prevention of Problems	Treatment Planning Modifications
1. Sudden death resulting from cardiac arrest or	1. Infection	1. Detection of classification of patient for heart failure for quick assessment and possible referral to physician and no routine dental	<u>Dentist Recommendations:</u> In patients under good medical

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<p>arrhythmia</p> <p>3. Cerebrovascular accident</p> <p>4. Infection</p> <p>5. Infective endocarditis if heart failure is caused by rheumatic heart disease, congenital heart disease, etc</p> <p>6. Breathing difficulty</p> <p>7. Drug side effects include:</p> <p>a. Orthostatic hypotension (diuretics, vasodilators)</p> <p>b. Arrhythmias (digoxin, overdose)</p> <p>c. Nausea, vomiting (digoxin, vasodilators)</p> <p>d. Palpitations (vasodilators)</p>	<p>2. Bleeding</p> <p>3. Petechiae</p> <p>4. Ecchymoses</p> <p>5. Drug related Xerostomia or Lichenoid mucosal lesions</p>	<p>care until patient under good medical management (class I or II but caution for class III and contraindicated for class IV until stabilized).</p> <p>2. Patients need to be under good medical management and the cause of heart failure and any other complications must be controlled prior routine dental care including:</p> <p>a. Hypertension</p> <p>b. Valvular disease (rheumatic heart disease) with premedication</p> <p>c. Congenital heart disease</p> <p>d. Myocardial infarction</p> <p>e. Renal failure</p> <p>f. Thyrotoxicosis</p> <p>g. Chronic obstructive lung disease</p> <p>3. Assessment of oral manifestations of disease.</p> <p>4. Assess for adverse events from medication use:</p> <p>a. Digitalis—patient more prone to nausea and vomiting</p> <p>b. Anticoagulants—dosage should be reduced so that prothrombin time is 2.5 times</p>	<p>management with no complications, any indicated dental care can be performed;</p> <p>1. For class I or II patients, maximum 0.036 mg epinephrine or 0.20 mg levonordefrin to be used; vasoconstrictors avoided in class III or IV patients.</p> <p>2. Patients with shorter visits and in semi-supine or upright position during treatment to decrease collection of fluid in lung</p> <p>3. Monitor blood pressure and Appointment terminated if patient becomes fatigued or stressed.</p> <p>4. Regular Oral Hygiene visits (1 per 6 months)</p> <p><u>Patient Recommendations:</u></p> <p>1. Alert the dentist of the medical history</p> <p>2. Maintain good oral hygiene</p> <p>3. Monitor their symptoms that may suggest complications</p>

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		<p>normal value or less (INR of 3.5 or less) (takes 3 or 4 days). Check prothrombin time in medical history</p> <p>c. Antidysrhythmic agents (see cardiac arrhythmias)</p> <p>d. Antihypertensive agents (see hypertension)</p> <p>e. Avoidance of outpatient general anesthesia</p>	and inform dentist prior to and during appointment

**\*ACC/AHA Classification of Chronic Heart Failure.** **I.** High risk for developing heart failure, Hypertension, diabetes mellitus, CAD, family history of cardiomyopathy. **II.** Asymptomatic heart failure, previous MI, LV dysfunction, valvular heart disease **III.** Symptomatic heart failure with structural heart disease, dyspnea and fatigue, impaired exercise tolerance **IV.** Refractory end-stage heart failure with marked symptoms at rest despite maximal medical therapy

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*II. Chronic Obstructive Pulmonary Disease (COPD) is a slowly progressive disease of the airways that is characterized by a gradual loss of lung function. COPD includes chronic bronchitis, chronic obstructive bronchitis, or emphysema, or combinations of these conditions and can lead to pneumonia, heart disease, and death. They represent the fourth leading cause of death in the U.S with symptoms ranging from chronic cough and sputum production to severe disabling shortness of breath. In some individuals, chronic cough and sputum production are the first signs that they are at risk for developing the airflow obstruction and shortness of breath characteristic of COPD. In others, shortness of breath may be the first indication of the disease. The diagnosis of COPD is confirmed by the presence of airway obstruction on testing with spirometry. Patients with COPD need special attention similar to CHF during dental care including avoiding procedures that can limit breathing, cardiovascular strain, use of adequate pain control, shortened visits, and a cautious eye to possible complications. They also need special attention regarding preventing oral infections and periodontal disease that may contribute to pneumonia and complications.<sup>1</sup>*

Table 2. Chronic Obstructive Pulmonary Disease			
Potential Problems Related to Dental Care	Oral Manifestations	Assessment for Prevention of Problems	Treatment Planning Modifications
Aggravation or worsening of compromised respiratory function	Leukoplakia, erythroplakia or frank carcinoma in chronic smokers	<ol style="list-style-type: none"> <li>1. Assessment of oral manifestations of COPD.</li> <li>2. Detection of classification of patient for COPD for quick assessment and possible referral to physician</li> <li>3. No routine dental care until patient under good medical management</li> </ol>	<p><u>Dentist Recommendations:</u></p> <p>In patients under good medical management with no complications, any indicated dental care can be performed. Specific recommendations include;</p> <ol style="list-style-type: none"> <li>1. Use shorter visits and upright chair position</li> <li>2. Minimize use of bilateral mandibular or palatal blocks</li> <li>3. Do not use rubber dam in severe disease</li> <li>4. Use of low-flow oxygen if helpful but do not use nitrous oxide–oxygen sedation in severe emphysema</li> <li>5. Low-dose oral diazepam is acceptable but avoid barbiturates, narcotics, antihistamines,</li> </ol>

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			<p>and anticholinergics</p> <ol style="list-style-type: none"> <li>6. May need additional steroid dose in patients taking systemic steroids for surgical procedures</li> <li>7. Avoid macrolide antibiotics (erythromycin, clarithromycin) for patient taking theophylline</li> <li>8. Outpatient general anesthesia contraindicated</li> <li>9. Regular Oral Hygiene visits because of greater risk of oral cancer from smoking (1 per 6 months)</li> </ol> <p><u>Patient Recommendations:</u></p> <ol style="list-style-type: none"> <li>1. Alert the dentist of the medical history.</li> <li>2. Maintain good oral hygiene.</li> <li>3. Monitor their symptoms that may suggest complications and inform dentist prior to and during appointment</li> </ol>

III. Diabetes mellitus is a common disease affecting about 7% of the population and has many concomitant oral manifestations that impact dental care. It is a syndrome of abnormal carbohydrate, fat, and protein metabolism that results in acute and chronic complications due to the absolute or relative lack of insulin. There are three general categories of diabetes: type 1, which results from an absolute insulin deficiency; type 2, which is the result of insulin resistance and an insulin secretory defect; and gestational, a condition of abnormal glucose tolerance during pregnancy. Diabetes develops in people of all ages, although in greater frequency in African-Americans and Hispanics, and prevalence has increased dramatically over the past several decades.<sup>2</sup> Approximately one-third of adults with diabetes in the United States are undiagnosed, and preventive care among patients with diabetes falls below national health objective standards.<sup>1</sup> Diagnosis is often made on the basis of a host of systemic and oral signs and symptoms, including oral gingivitis and periodontitis, recurrent oral fungal infections and impaired wound healing. Dental professionals can play an important role in diagnosing and managing patients with diabetes as well as changing their care to consider the risks associated with diabetes. These patients often have xerostomia, increased caries and periodontal disease, candida albicans, oral lichen planus, and burning mouth syndrome.<sup>3-5, 6-8</sup> Increased efforts towards oral hygiene are paramount to management. Although diabetes patients are less likely to have regular dental exams, these exams occur more frequently when the dentist is made aware of the patient's diabetes status.<sup>9</sup>

Table 3 Diabetes Mellitus			
Potential Problems Related to Dental Care	Oral Manifestations	Assessment for Prevention of Problems	Treatment Planning Modifications
<ol style="list-style-type: none"> <li>1. In uncontrolled diabetic patients: Infection and poor wound healing</li> <li>2. Insulin reaction in patients treated with insulin</li> <li>3. In diabetic patients, early onset of complications relating to cardiovascular system, eyes, kidneys, and nervous system (angina, myocardial</li> </ol>	<ol style="list-style-type: none"> <li>1. Accelerated periodontal disease</li> <li>2. Gingival proliferations</li> <li>3. Periodontal abscesses</li> <li>4. Xerostomia</li> <li>5. Poor healing</li> <li>6. Infection</li> </ol>	<ol style="list-style-type: none"> <li>1. Assessment of oral manifestations of diabetes and oral hygiene compliance</li> <li>2. Detection of patient with diabetes for quick assessment and possible referral to physician. This includes Detection using History, Clinical findings, Screening blood glucose level &lt;126 mg% and then Referral for diagnosis and treatment. Monitoring and control of hyperglycemia by blood glucose monitoring as well as HbA1c status(&lt;7%)</li> </ol>	<p><u>Dentist Recommendations:</u></p> <p>In well-controlled diabetic patients, no alteration of treatment plan is indicated unless complication of diabetes present such as hypertension and congestive heart failure</p> <ol style="list-style-type: none"> <li>1. Patients receiving insulin—insulin reaction prevented by the following: <ol style="list-style-type: none"> <li>a. Eating of normal meals before appointments</li> <li>b. Scheduling of appointments in</li> </ol> </li> </ol>

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<p>infarction, cerebrovascular accident, renal failure, peripheral neuropathy blindness, hypertension, congestive heart failure)</p>	<p>7. Oral ulcerations 8. Candidiasis 9. Mucomycosis 10. Numbness, burning, or pain in oral tissues</p>	<p>3. Drug considerations include the following:</p> <ul style="list-style-type: none"> <li>a. Insulin—insulin reaction</li> <li>b. Hypoglycemic agents—on rare occasions aplastic anemia</li> <li>c. Avoidance of general anesthesia in severe diabetics</li> </ul>	<p>morning or midmorning</p> <ul style="list-style-type: none"> <li>c. Informing the dentist of any symptoms of insulin reaction when they first occur</li> <li>d. Having sugar available in some form in case of insulin reaction</li> </ul> <p>2. Diabetic patients being treated with insulin who develop oral infection may require increase in insulin dosage; consult with physician in addition to aggressive local and systemic management of infection (including antibiotic sensitivity testing)</p> <p>3. Regular Oral Hygiene visits (1 per 6 months)</p> <p><u>Patient Recommendations:</u></p> <ul style="list-style-type: none"> <li>1. Alert the dentist of the medical history.</li> <li>2. Maintain good oral hygiene.</li> <li>3. Monitor their symptoms that may suggest complications and inform dentist prior to and during appointment</li> </ul>

IV. Conditions or medications causing xerostomia. Xerostomia affects approximately 25 percent of the population and, is largely related either to autoimmune salivary gland disease or medication that a patient is currently taking.<sup>10</sup> The patient also may experience burning of the tissues, irritation of the tongue, and painful ulcerations. Xerostomia increases susceptibility to caries and also to erosion and dentin hypersensitivity. Many commonly prescribed medications can cause a decrease in salivary function include antihistamines, antidepressants, anti-psychotics, anti-hypertensives, anti-inflammatories, diuretics, sedatives, and narcotics as well as be the result of Sjögren’s syndrome, a disorder of the immune system in which white blood cells attack the moisture-producing glands. Various other conditions may cause xerostomia as well, including diabetes, lupus, kidney diseases, stress, anxiety, depression, nutritional deficiencies, and a dysfunction of the immune system, such as caused by HIV/AIDS. Furthermore, cancer radiation therapy on or near the salivary glands can temporarily or permanently damage the salivary glands. Prolonged reduction of saliva can lead to increased decay, as well as mouth ulceration, an increased susceptibility to infection, psychological distress, physical discomfort, and social embarrassment.

With xerostomia, there is an increase in dental caries, particularly cervical, proximal, and in the roots; cracking and fissuring of the tongue; frothy saliva; ulceration of oral mucosa; no pooling of saliva in the floor of the mouth; and recurrent oral candida infections. When treating patients with xerostomia, dentists should measure a patient’s salivary flow, consider salivary substitutes and over-the-counter salivary mouthwashes, gels, and sprays, and self care suggestions such as drinking more water and chewing gum, A medication review of the dosage or brand of a patient’s medication may suggest alternatives that cause less side effects. Other treatment considerations include: the use of Pilocarpine hydrochloride or cevimeline to stimulate the saliva glands, which can increase the production of saliva by up to 40 percent; the use of Amifostine (Ethyol) to protect against xerostomia for patients with head and neck cancer who undergo radiation therapy, and evaluation for candidiasis because of the lack of saliva; and improving the fit of dentures.

Table 4. Xerostomia

Etiology: radiation therapy or chemotherapy(any) for head and neck cancers, stress-depression-anxiety, diabetes, cirrhosis, end stage renal disease, bone marrow transplant, more than 1400 medications (antihistamines, diuretics, antihypertensives, tricyclic antidepressants, etc.), connective tissue diseases (Sjogren’s,et.al.), smoking, ethanol intake, mouth breathing

Potential Problems Related to Dental Care	Oral Manifestations (% of patients)	Prevention and Treatment of Problems	Treatment Planning Modifications
Caries Periodontal	orcheilosis/ angular cheilitis (75-88)	1. Salivary testing to determine saliva	<u>Dentist Recommendations</u> 1. At visit; allow patient to drink, sip water and

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<p>problems</p> <p>Speech problems</p> <p>Burning mouth</p> <p>eating</p>	<p>glossitis (80-90)</p> <p>mucositis (5-30)</p> <p>glossodynia (5-45)</p> <p>dysgeusia (25-75)</p> <p>dysphagia (10-75)</p> <p>candidiasis (75)</p> <p>dental caries (100)</p> <p>periodontitis (60-100)</p>	<p>production level</p> <p>2. Assessment of oral manifestations of xerostomia and oral hygiene compliance</p> <p>3. Detection of patient with xerostomia for quick assessment and possible referral to physician.</p>	<p>liquids,</p> <p>2. Avoid alcohol, tobacco, , coffee and tea (caffeine) prior to visit</p> <p>3. Regular Oral Hygiene visits (1 per 6 months)</p> <p>4. Improve moisture and lubrication. (continuous and prn) with products including;</p> <div style="border: 1px solid black; padding: 5px;"> <p>ORAL BALANCE®* (esp. PM)</p> <p>Rx:PILOCARPINE HCl 2% (Salagen® 5 mg, tid)</p> <p>Rx: CEVEMILINE HCL (Evoxac ® 30 mg capsules)</p> <p>MOUTHKOTE® (artificial SALIVA)</p> <p>OPTIMOIST ®^(artificial SALIVA)</p> <p>Na-carboxymethylcellulose 0.5% sln.</p> <p>ALIVART ® (artificial SALIVA)</p> </div> <p>4. Identify and treat soft tissue lesions and soreness with products;</p> <div style="border: 1px solid black; padding: 5px;"> <p>ORAL BALANCE®*</p> <p>BENEDRYL+ MAALOX+NYSTATIN (+/- Carafate®) ELIXER **</p> <p>if ACUTE, add +/- 2% Lidocaine or DECADRON 0.5mg/5cc Elixir</p> </div>

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			<p>BIOTENE® MOUTHWASH *</p> <p>TRIAMCINOLONE 0.1% in Orabase® (ORABASE-HCA®)</p> <p>MYCELEX® 60 mg troches</p> <p>If LIPS/TONGUE lesions present, use MYCOLOG II ointment</p> <p><u>Patient Recommendations:</u></p> <ol style="list-style-type: none"> <li>1. Alert the dentist of the medical history.</li> <li>2. Maintain good oral hygiene and use sugarless candy /gum to stimulate saliva.</li> <li>3. Avoid alcohol, tobacco, , coffee and tea (caffeine) prior to visit</li> <li>4. Monitor their symptoms that may suggest complications and inform dentist prior to and during appointment</li> </ol>

\* Laclede Pharmaceuticals, Gardena, CA (800) 922-5856; # ORABASE-HCA topical gel; Colgate- Palmolive Co., Piscataway, NJ; @ Parnell Pharmaceuticals, San Rafael, CA (800) 457-4276; \*\* Rx : Benedryl 25mg/10cc + Nystatin 100,000 IU/cc + Maalox 4cc= 15cc; ^

Rx : Decadron Elixer 0.5%/5cc Disp: 100 cc Sig: 1 tsp. t.i.d swish-swallow; ^^ Prevident Neutral NaF 1.0% in trays B.I.D. ; OPTIMOIST ( oral moisturizer): Colgate-Hoyt, Inc.

\*\*\*RETADEX; ROWPAR Pharmaceuticals, Phoenix, AZ

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