The Oral-Systemic Link: An Opportunity for Collaboration
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Bidirectional Relationship of Diabetes and Oral Health

As the prevalence of diabetes grows in the United States and elsewhere, health care providers including dental providers are striving to help patients prevent and manage the effects of the disease. With regard to oral health, these effects can be significant. Xerostomia (dry mouth), recurrent oral candidal infections, and increased risk of postoperative infection after surgical dental procedures such as extractions are all more common among patients with diabetes.1 It is yet unclear whether people with diabetes experience more caries (tooth decay); however, diminished salivary flow and xerostomia-inducing medications (e.g., anti-hypertensive agents) are both important risk factors and may play a role.

Most notably, type 2 diabetes and periodontal disease are strongly correlated in the scientific literature,2–5 with some going so far as to call periodontal disease the sixth major complication of diabetes after retinopathy, nephropathy, neuropathy, cardiovascular disease (CVD), and poor wound healing.6 In moderate and advanced stages, there is a progressive destruction of connective tissue of the periodontium, including ligaments and bone that hold teeth in place. People with type 2 diabetes are more susceptible to periodontal disease than those without diabetes, and their disease is more likely to result in tooth loss.7,8

Also of concern is persistent inflammation associated with chronic periodontitis and the deleterious impact of inflammatory mediators on metabolic control. Unmanaged diabetes is a primary risk factor for the progression of periodontal disease, and unmanaged periodontal disease appears to contribute to elevated blood glucose.2,9

The cycle can seem rather hopeless, but more optimistically, recent studies suggest that management of periodontal disease with nonsurgical treatment may actually help contribute to the management of glycemic control.10

The link between oral and systemic health is firmly established, and in the case of diabetes, the best evidence supports a bidirectional relationship.2–5 Solutions will therefore involve the cooperation of patients and their team of providers—both dental and medical.

Troubling, in this context, are studies suggesting that individuals with diabetes are less likely to visit a dentist than those without and lack important knowledge about the oral implications of diabetes.16 In a 2000 article in the Journal of the American Dental Association,16 Moore et al. found pediatric subjects with type 1 diabetes to have a poorer perception of their oral health than control subjects (without diabetes). However, relatively few (18.2%) believed their oral health would be better if they did not have diabetes or reported ever having been told that oral hygiene is important because they have diabetes (27.1%). Only 59.1% of those with diabetes felt they received dental care as often as they should and cited cost most frequently (51.6%) as the reason for not visiting the dentist more often. This is a concern that resonates with the general U.S. population, but which poses potentially more
problematic results for those with diabetes.

Cost Concerns
Compared to the medically insured U.S. adult population (~ 86%), the percentage of dentally insured is much smaller, at roughly 57% of Americans >18 years of age. Among older age-groups, the difference is even greater, with ~ 95% of those ≥ 65 years of age having medical coverage, whereas only 42% have any dental coverage. As the U.S. population ages and the prevalence of diabetes continues to increase, novel ways to make affordable the ongoing treatment that is the current standard of care for periodontal therapy will be an increasingly pressing concern for patients and their families, providers, and third-party payers.

Importance of Regular Dental Care
Primary care providers who have not had periodontal treatment themselves may not be familiar with what patients experience during periodontal therapy. Initial nonsurgical treatment involves the scaling away of plaque and calculus (hardened plaque), which harbors anaerobic bacteria in deep periodontal pockets that may be unreachable by patients when performing self-care. In some cases, pockets are irrigated and antimicrobial or antiseptic medication is administered into the pocket for the localized control of bacterial colonization, which results in the classic presentation of inflammation and destruction of tooth-supporting tissues, including ligament and bone.

The disease is multifactorial and dependent on patients’ unique host responses. Some patients may require low-dose oral antibiotics administered during several months. Unresponsive areas are monitored carefully, and treatment plans are revised accordingly. Daily self-care is evaluated, and patient education occurs throughout treatment. Conservative treatment can be effective in reducing the need for surgical interventions and the risk of tooth loss.

Like diabetes, periodontal disease is a chronic condition that is not cured, but rather managed. Regular periodontal maintenance and preventive examination and cleaning are important to this management, but the associated out-of-pocket costs can become a barrier. Because traditional dental insurance typically covers preventive visits every 6 months, a recommended shortened recall interval of 3–4 months may result in patients bearing out-of-pocket expense for one to two additional visits per year.

When patients cannot adhere to recommended treatment and periodontal maintenance frequency, progression of the disease often results. In some cases, surgical intervention is warranted to remove diseased tissue, contour the gingiva (gum tissue) to improve access to the involved areas so that providers and patients can keep the tissues clean, or graft bone in areas where bone loss has threatened the prognosis of a tooth or has involved adjacent structures (e.g., the floor of the sinus).

If periodontal disease progresses, it can and does result in tooth loss. Although the prevalence is decreasing in the general U.S. population, the burden of periodontally related tooth loss is still disproportionately higher for individuals with diabetes.

Organizational Efforts
HealthPartners, located in Minneapolis, Minn., is the nation’s largest consumer-governed nonprofit cooperative and encompasses a medical group, medical plan, dental group, and dental plan. The triple aim of the organization is to strive to simultaneously optimize 1) the experience of individuals, 2) the health of a defined population, and 3) the per-capita costs for the population. Since 1993, HealthPartners has participated with six Minnesota health plans and 56 medical groups in the Institute for Clinical Systems Improvement, which has established best practices for optimal care and community measures of diabetes outcomes. Because of systematic improvements in the delivery of diabetes care, it is estimated that within these care systems, > 115 heart attacks did not occur, 925 cases of diabetes-related eye disease did not develop, and 155 fewer amputations have been performed than would have been expected based on previous performance.

Striving to contribute to optimal diabetes care with the triple aim at the forefront, the HealthPartners Dental Group and Dental Plan have also responded to the needs of patients with diabetes. Two significant ways: risk assessment for all patients and extended dental insurance benefits for patients with diabetes.

1. Risk assessment for all patients
Care within the HealthPartners Dental Group is based on ongoing risk assessment for every patient. In the review of a patient’s medical and dental history, chronic diseases such as diabetes factor into the evaluation of risk for that individual with regard to caries (cavities), periodontal disease (gum disease), and oral cancer. Treatment recommendations, including the frequency of recall visits (the term used in dental care to indicate how often a patient is advised to return for evaluation and treatment), are risk-based. Therefore, a patient with diabetes may be recommended a shorter recall interval (e.g., 3–6 months) than a healthy patient without diabetes (e.g., 6–12 months) based on the higher risks of developing periodontal disease and tooth decay.

2. Extended dental insurance benefits for patients with diabetes
HealthPartners’ response to the need to promote appropriate risk-based treatment for patients whose not only oral but systemic health is at stake has resulted in an important insurance change for patients with diabetes. In 2008, a special benefit was extended to patients with diabetes who carry HealthPartners commercial dental plan coverage: a network that includes > 2,100 preferred providers in Minnesota and 400,000 members. Co-payments were eliminated, and no deductible or out-of-pocket annual maximum was required for examinations, cleanings, periodontal cleanings, debridement, or scaling and root planing for those who qualify. This benefit was developed to address concerns that out-of-pocket dental expenses may be a barrier to receiving important services—specifically,
services that may help to decrease the risk of oral disease that may complicate patients’ systemic health.

Call to Action
Further innovation is needed to cost-effectively deliver comprehensive services, including oral health care, to patients with chronic diseases such as diabetes. HealthPartners’ efforts in this regard are unique, and only a limited number of health plans extend any special dental benefit to patients with diabetes.23

David S. Gesko, DDS, dental director and senior vice president of the HealthPartners Dental Group, speaks directly with patients and diabetes health educators in the HealthPartners system about the important connection between systemic and oral health and providers updates about the benefits of managing oral health as part of overall health. The connection is one that patients take to heart. Additional confirmation from primary medical care providers about the importance of prioritizing oral health as a part of the complete management of diabetes is also important. This may include:

• Assessing diabetic patients’ access to dental care as a part of regular diabetes care
• Referring patients with diabetes who have not had a recent dental exam to a dentist for complete evaluation of the their oral health, and
• Reminding patients to update their dental providers about the status of their overall health, including any changes related to diabetes or medications

Electronic medical and dental records continue to be adopted and developed to support patient care. It is foreseeable that clinical decision support systems will be developed within the medical environment to help providers identify and refer for regular dental care patients who are at high risk for oral health-related concerns, such as those with diabetes. Patients of the future will require and increasingly expect better collaboration among their team of care providers. The time is upon us for partnering to devise new strategies that improve the health of our communities.

References
12Rush WA, Rindal B: Diabetes and caries. Presentation at the International Association of Dental Research 82nd General Session in Honolulu, Hawaii, 11 March 2004
15Macek MD, Taylor GW, Tomar SL: Dental and other healthcare visits among adults with diagnosed diabetes. Presentation at the American Association of Dental Research 84th General Session in Orlando, Fl., 8 March 2006
20Wilson TG: Not all patients are the same: systemic risk factors for adult periodontitis. Gen Dent 47:580–588, 1999
22Butcher L: Multifaceted diabetes program pays off for healthpartners. Manag Care 18:36–40, 2009

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