



POLICY RESEARCH REPORT

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Oral Health Care and Primary Health Care:

Stronger Together
in Recognizing and
Managing Diabetes

EXECUTIVE SUMMARY

The connection between an individual's oral health and overall health is well established in the oral health literature. Particularly, oral health diseases, such as periodontal disease, are a major complication in patients with diabetes and vice versa. Unmanaged diabetes is a risk factor to the progression of periodontal disease, and oral health diseases may contribute to elevated glucose levels.¹ The connection between periodontal disease and systemic conditions is known as the oral-systemic link. Recognition of the oral-systemic link warrants integration of the oral health care and primary health care disciplines to help prevent and manage oral and chronic conditions in patients. This report addresses the importance of the oral-systemic link and how oral and chronic diseases, such as diabetes, benefit from a higher level of integration of primary health care and oral health care. This research also discusses dental education's role in preparing the oral health providers of tomorrow to recognize the oral-systemic link and its importance to overall health.

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1 THE RELATIONSHIP BETWEEN ORAL HEALTH DISEASES AND DIABETES SHOWCASES THE ORAL-SYSTEMIC LINK.

The oral cavity is the window to the body and systemic diseases. Overall, research indicates two mechanisms for the oral-systemic link: 1) inflammation and infection in the mouth has direct consequences on inflammatory markers elsewhere in the body, and 2) the oral cavity serves as a reservoir for pathogenic bacteria that can travel through the bloodstream to various organs.^{2,3} Diabetes is one of a number of chronic or systemic diseases identified by the Centers for Disease Control and Prevention that places the U.S. health care system under tremendous pressure. Approximately 37.3 million people, or 11.3% of the U.S. population, were living with diagnosed and undiagnosed diabetes in 2020.⁴ Additionally, periodontal disease is one of the most common oral health diseases, and a diabetes risk factor that affects more than 40% of adults in the United

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States,⁵ and is linked to higher glucose levels.⁶ Susceptibility to periodontal disease increases by three-fold in patients with diabetes,⁷ and approximately 22% of patients with diabetes have periodontal disease (see [Figure 1](#)).⁸ For example, a 1990 study of over 2,200 Pima Indians from the Gila River Indian Community in Arizona found that the rate of periodontal disease was 2.6 times higher in the cohort living with diabetes.⁹ These findings illustrate the importance of discerning the oral-systemic link that exists between diabetes and periodontal disease.

Diabetes is costly. In 2017, the American Diabetes Association estimated the total medical costs and cost associated with reduced productivity of diagnosed diabetes (types 1 and 2) at \$327 billion.¹⁰ Additionally, the care of people with diagnosed diabetes accounts for one in every four health care dollars in the United States.¹¹ The American Diabetes Association standards note that nearly 33% of patients over the age of 30 seen in dental practices had abnormal blood glucose levels as measured by Hemoglobin A1c (HbA1c).^{12,13} For those with periodontal disease who are receiving treatment and care, research indicates that medical costs would be reduced between \$900–\$2,840 per patient with diabetes and by \$1,090 per patient with other systemic conditions, such as heart disease.¹⁴

Various studies have shined a light on the periodontal disease and diabetes bidirectional relationship. A 2010 longitudinal study conducted in Germany on approximately 3,000 people with no diabetes showed that the presence of advanced periodontitis severely increased HbA1c levels fivefold¹⁵ and increased the risk of type 2 diabetes.

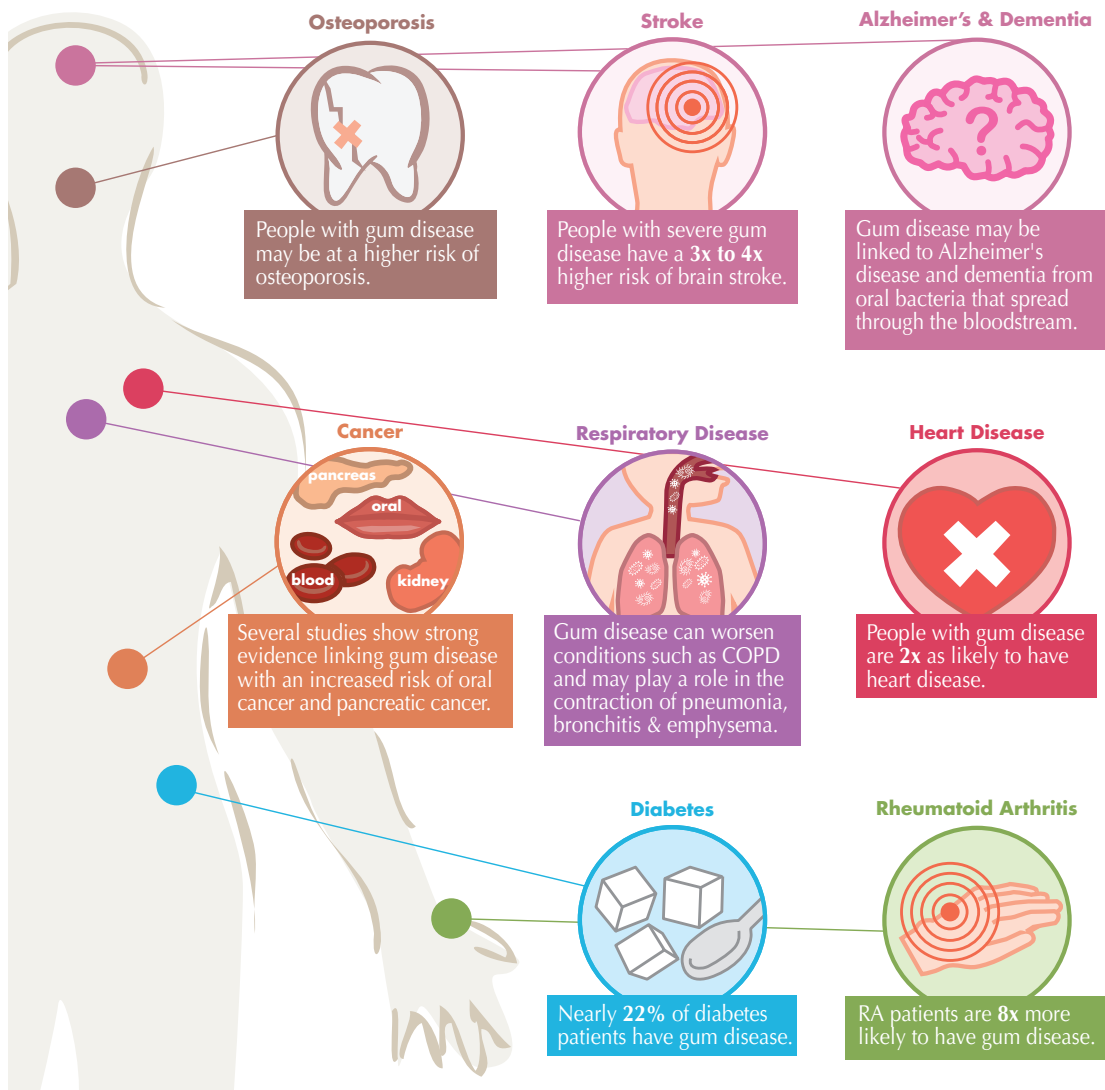
FIGURE 1

Gum Disease and Your Whole Body Health



Gum Disease & Your Whole Body Health

Over 50% of adults in the U.S. have some degree of gum disease. But did you know the impact goes far beyond your mouth...



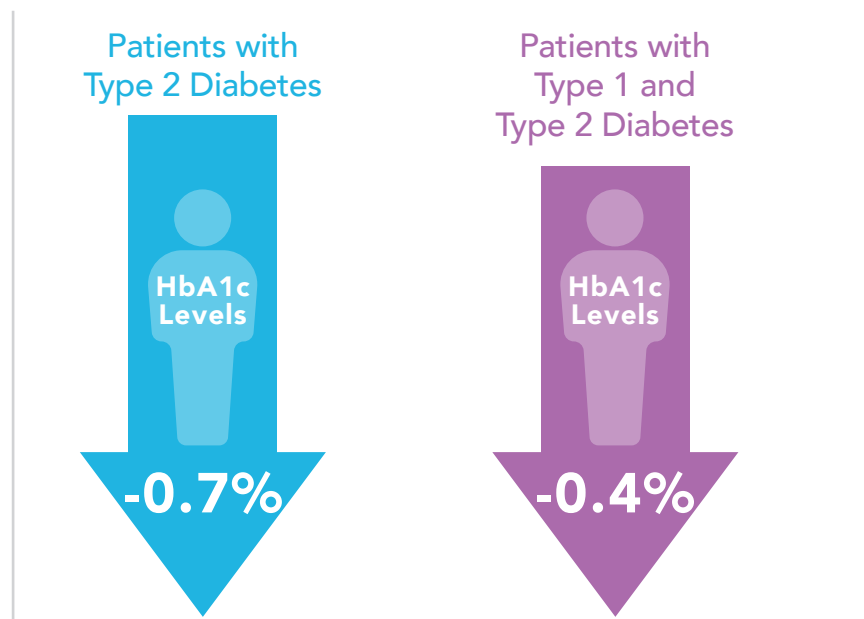
Source: Adapted with permission from The Institute for Advanced Laser Dentistry, Cerritos, CA. At: fightgumdisesease.com/wp-content/uploads/2016/12/Systemic-Connections-infographic.pdf. Accessed: Feb. 2, 2022.

From a molecular level, a study conducted in 1998 by researchers at the University at Buffalo School of Dental Medicine (UB SDM) Periodontal Disease Research Center concluded that the elimination of periodontopathic organisms and inflammatory markers are essential to the reduction of HbA1c.¹⁶ Lastly, an analysis across 10 intervention studies in 2005 with a total of 456 patients with diabetes determined that treatment of periodontal disease

decreased HbA1c levels by 0.70% in type 2 diabetes patients and by 0.40% in both type 1 and type 2 diabetes patients (see [Figure 2](#)).¹⁷ Diabetes is an established risk factor for periodontal disease and severe periodontal disease complicates the management of diabetes and metabolic control.¹⁸ Thus, adequate control of periodontal disease and management of diabetes are necessary to achieve optimal long-term oral and overall health.

FIGURE
2

Treatment of Periodontal Disease Decreases HbA1c Levels



Source: Janket SJ, Wightman A, Baird AE, Van Dyke, TE. et al. Does periodontal treatment improve glycemic control in diabetic patients? A meta-analysis of intervention studies. *J Dent Res* 2005;84(12):1154-9.

2 REDUCING THE BURDEN OF CHRONIC DISEASES, SUCH AS DIABETES, BENEFITS FROM INTEGRATED EFFORTS OF ORAL HEALTH CARE AND PRIMARY HEALTH CARE.

Currently, there is a concerted effort to mitigate the burden of chronic disease by moving towards whole body health. The 2000 U.S. Surgeon General's report and the 2021 [Oral Health In America: Advances and Challenges](#) report recognized the oral-systemic link, such as the association between periodontal disease and chronic diseases including diabetes.^{19,20} These seminal reports also posited that oral health is integral to general health and oral health care should be included in the provision of health care at the individual and community levels.

Screening for chronic disease in the dental office is an added value to the overall health of a patient. Preventive dental care visits, especially for people at risk or living with a chronic disease, is essential. With nearly 75% of adults in the United States visiting the dentist in 2020,²¹ diabetes screening is opportune. The 2022 American Diabetes Association's [Standards of Care](#) guidelines include the recommendation to screen for diabetes in the dental setting.²² This standard also promotes referral to primary health care from the dental setting for improving and managing diabetes. Similarly, the American Academy of Periodontology released updated periodontal classifications in 2018 that included HbA1c readings as a criterion for staging and grading periodontal disease.^{23,24} Clinical trials from 2013-2017 indicated that periodontal treatment reduced heightened HbA1c levels after three months, with an even greater reduction after six months.²⁵ The American Diabetes Association and the American Academy of Periodontology guidelines serve as supportive tools for the integration of oral and primary health care.

Primary health care can have a significant impact on oral health. A 2017 study across five Federally Qualified Health Centers (FQHCs) in the United States determined that in the absence of a dentist, primary care physicians are directly involved in the provision of oral health care.²⁶ For example, in a Kentucky-based FQHC with no dental clinic, primary health care physicians provide dental services for its patients, perform periodontal disease screenings and administer fluoride varnish for the prevention of dental caries.²⁷ Primary health care physicians who receive oral health-related training can appropriately counsel and treat patients experiencing chronic illnesses and oral health problems.²⁸ From a diabetes perspective, primary health care professionals have the opportunity to discuss the importance of oral health care during diabetes reviews and raise awareness of various oral manifestations of diabetes.²⁹ Therefore, proper management of chronic diseases from a primary health care context is crucial to controlling the progression of oral health diseases.

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Chronic disease screenings can be cost-effective in the long term. According to a 2014 study, early detection of diabetes in the oral health care setting would be cost-effective and offset the cost of future, more intensive interventions as the disease progresses.³⁰ Approximately \$42.4 million could be potentially saved if medical screenings for diabetes

and other chronic diseases would be done in the dental setting.³¹ Glucose screenings performed in the dental setting can assist oral health providers and their medical counterparts with measuring disease risk, conducting oral health assessments and managing chronic conditions, such as diabetes.

3 ORAL HEALTH EDUCATORS SUPPORT THE INTEGRATION OF ORAL HEALTH CARE WITH PRIMARY HEALTH CARE TO ADDRESS THE ORAL-SYSTEMIC LINK.

Oral health educators are essential in preparing the next generation of oral health providers on the oral-systemic link. In a 2007 study of U.S. and Canadian dental schools, an overwhelming 88% of the responding dental schools reported that predoctoral students are taught the role of inflammation and its impact on oral-systemic conditions.³² Additionally, 48% of the respondent dental schools indicated having formal training on communication tactics for periodontal oral-systemic disease with patients.³³ According to data from the 2018-2019 Commission on Dental Accreditation, U.S. dental schools teach the impact of systemic conditions on oral health through lectures (100%), case-based learning (85%), seminars (68%) and in clinic (86%).³⁴ Additionally, diabetes, tobacco use and cardiovascular disease were the top three most emphasized topics taught on oral-systemic diseases, according to a 2007 survey on U.S. dental hygiene programs.³⁵ These findings demonstrate that dental schools and programs have been engaged in teaching the relationship of oral disease and systemic conditions for many years.

Through community-based experiences, oral health educators have a unique opportunity to enhance students' knowledge on the oral-systemic link and to further integrate oral health care with primary health care. For example, the Marshfield Clinic, the largest private medical group in Wisconsin, integrates dentistry and medicine at all levels of health care.³⁶

Marshfield Clinic's Family Health Center Dental Clinic,³⁷ a FQHC and affiliate of A.T. Still University-Arizona School of Dentistry & Oral Health, ushers an integrative dental and medical approach to train students on the use of data and electronic health records in their clinical rotations. Further, the clinic's

The Marshfield Clinic, the largest private medical group in Wisconsin, integrates dentistry and medicine at all levels of health care.

electronic health model aims to reverse negative trends in diabetes and periodontal disease by integrating primary health care and oral health care.^{38,39} Adoption of integrated electronic health records at dental schools with affiliated primary health care systems, such as FQHCs, can assist in early detection of chronic disease and train future dentists to screen for chronic diseases.

ADEA supports the advancement, education and training of new dentists and allied dental health professionals. In 2008, the ADEA House of Delegates adopted competencies for oral health providers. These competencies included the recognition and management of oral manifestations and systemic diseases, and the participation of dental team and other health care providers in management of systemic diseases and health promotion for all patients.⁴⁰ Similarly, in 2021, the ADEA House of Delegates adopted a resolution recognizing oral health care as essential to primary health care.⁴¹ This newly adopted resolution also encouraged the education of students, residents and oral health providers in ordering and administering diagnostic tests and screening for systemic diseases and conditions.⁴² ADEA stands strongly in supporting its Member Institutions to prepare the future oral health workforce on the integration of oral health care and primary health care through dental pedagogy.

CONCLUSION

The integration of oral health care and primary health care reduces the burden of chronic diseases in the United States. Oral health providers play an important role in improving health outcomes of individuals and communities by addressing systemic diseases, such as diabetes, that may manifest through the oral cavity. Conversely, primary health care has an equal duty in managing chronic diseases to prevent the development of oral health diseases. Recognizing the bidirectional relationship of diabetes and periodontal diseases demonstrate this important relationship. Integrating an oral health care and primary health care system that is ready to combat future public health challenges is essential for all health care professionals. Academic dentistry plays a pivotal role in educating and training future oral health providers to manage systemic disease and promote overall health.

Integrating an oral health care and primary health care system that is ready to **combat future public health challenges** is essential for all health care professionals.

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