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Dentistry for  
Diabetics™

From Your Dentistry for Diabetics (DFD) Professional  
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# Informed

*The truth about the diabetic & oral care*

## The Year in Review

As 2009 comes to a close, it is time to look back over the year to see what has changed, what has improved, and what that may mean for the coming year.

In November of 2008, DentistryForDiabetics™ founder Dr. Charles W. Martin, DDS was asked what he thought the top priorities should be for 2009, related to improving the health of patients who live with or are at risk for diabetes. He answered with just two calls for action. Now, a year later, *Informed* revisits

what those goals and priorities to see how those in the diabetes healthcare community (dentists, researchers, diagnosticians and physicians) responded, and what has changed in 12 months.

We'll also discuss the degree to which the goals were achieved, and what more should be done. ...to see to what degree the goals were achieved.

2010

2009 2008

### Did You Know?

The rate of new cases of diagnosed diabetes rose by more than 90 percent among adults over the last 10 years, according to a study by the Centers for Disease Control and Prevention (CDC).

## Awareness and Education

In November 2008, the DentistryForDiabetics™ organization called on the health and research communities to do things in the coming 12 months to improve the health and wellbeing of those with diabetes or at risk for developing it.

The first priority was to continue to build a network of diabetes health care professionals, both dentists and physicians, focused on improving care for patients with diabetes, as well as those at risk for developing the disease.

This goal was of particular interest to DentistryForDiabetics because it was one the organization could affect directly. DFD launched a campaign in early 2008 to increase awareness among practitioners and patients about the connections between oral health and systemic health.

After seeing success with those efforts in 2008, the organization decided to extend that effort in 2009. The objectives for 2009 were to train more dentists in the specialized care needed to safely treat and manage patients with diabetes, to share the latest research and information with both dentists and physicians, and to educate the public at large about the oral health-

diabetes connection..

DFD developed the DentistryForDiabetics certification program designed to provide dentists with information and training in how to screen at-risk patients, how and when to test A1c levels, when to refer to physician, what specialized techniques to use when treating a patient with diabetes, and how to support physician-directed management plans.

The group also developed a communication tool set to facilitate referrals between dentists and physicians, as well as an online resource center where patients and practitioners can find DFD-certified dentists <http://www.dentistryfordiabetics.com/directory.php> and the latest information about oral health and diabetes information <http://www.dentistryfordiabetics.com/>.

**The results** have been impressive. Since November 2008, the number of dentists who have enlisted in the DentistryForDiabetics program more than tripled over the previous 11 months. The number of patients with diabetes who have contacted DentistryForDiabetics to find a dentist in their area has increased 62%, while the number of physicians referring patients to a DentistryForDiabetics dentists has increased more 40%.

## A Call for Research

DentistryForDiabetics, like many organizations concerned with the looming health challenges associated with an aging, at-risk population, call for research to examine the etiology of diabetes-related oral health issues in order to clarify the relationship between the two diseases. While a growing body of research has suggested there may be a two-way, causal relationship between the two, the challenge was to show, with more definitive research, how the two diseases impact one another. For example, do the

two diseases merely co-inhabit the subject? Or if there is a causal relationship, as suggested by research that has shown glycemic levels in subjects with diabetes normalize following treatment for oral infection, what is the connection precisely? If the relationship is two-way, as still more research has suggested, to what degree does oral disease impact diabetes?

### Check it out

**“Periodontal infection affects the health of the teeth and gums, but the body’s response to that infection, we believe, is systemic. . . .We also think that the body’s response to infection is exaggerated in people with diabetes—it makes them more susceptible to periodontal disease and makes it more severe.”**

— George Taylor, DrPH, DMD, associate professor of dentistry at the Schools of Dentistry and Public Health at the University of Michigan in Ann Arbor

**“Today, we know that oral health is impacted by diabetes.**

**We know that the longer the patient lives with diabetes the greater the chance he or she will contract oral complications in much the same way he or she will contract other comorbidity.**

**We also know that when diabetic patients are treated with diligent, rigorous oral care to combat oral infection and inflammation, we often see a reduction in hyperglycemic levels.**

**However, further research needs to be performed to expose the precise mechanisms that trigger that outcome.”**

Dr. Charles Martin, DDS  
*Informed*, November 2008

Most researchers agree that those characteristics of diabetes such as delayed wound healing and inhibited immune response may create vulnerabilities within the oral cavity and lead to a host of oral complications such as periodontal disease, gingivitis, dental caries, salivary gland dysfunction and xerostomia, burning mouth syndrome and increased susceptibility to oral infections).<sup>1-4</sup> However, there still remains healthy skepticism in the research community and the medical community about the question of whether oral diseases can lead to diabetes.

Interestingly, the same month Dr. Martin (founder of DentistryForDiabetics) called for more etiological research for diabetes and oral health, *Endocrine Today* published the results of a longitudinal research study out of Columbia University Mailman School of Public Health that found strong evidence that oral disease may lead to diabetes. Ryan T. Demmer, PhD, MPH, associate research scientist in the department

of epidemiology at Columbia, and Moise Desvarieux, MD, PhD, associate professor in the department of epidemiology at Columbia University, led the study.

The study followed more than 9,296 men and women aged 25 to 74 years – a representative sample of the US population in gender, ethnicity, geography and age – who were systemically healthy at the study’s start. Researchers reviewed oral health examination results for each subject, from 1971 to 1992. Of the 9,296 participants who began the study, 53% of dentate subjects developed periodontal disease (an advanced form of gum disease) during that period. Of those subjects with periodontal disease, more than 800 eventually developed incident diabetes — a rate 50% higher than systemically healthy subjects.

According to Demmer, the study showed that incident diabetes odds were increased by 40% among participants with gingivitis ( $P \leq 0.05$ ) and by 50% among participants with periodontitis ( $P \leq 0.05$ ) compared with periodontally healthy participants. These findings remained after multivariate adjustment for potential confounders including age, smoking, obesity, hypertension and dietary patterns.

What may be more interesting is the response of some researchers to the findings of Demmer and Desvarieux.

Serge Jabbour, MD, FACP, FACE, associate professor of clinical medicine in the division of endocrinology, diabetes and metabolic diseases at the Jefferson Medical College of Thomas Jefferson University, Philadelphia noted that the findings may clearly place oral diseases on the list of known risk factors for diabetes. He also added, “The results, however, are not completely unexpected, since there was a link between

## Did you know?

**Periodontitis induces production of pro-inflammatory cytokines such as TNF- $\alpha$ , IL-1, and IL-6**

— [Beck et al., 1996](#); [Loos, 2005](#)

**Secretion of tumor necrosis factor-alpha (TNF- $\alpha$ ) by adipose (fatty) tissue triggered by lipopolysaccharide from periodontal gram-negative bacteria may promote hepatic dyslipidemia and decrease insulin sensitivity**

— [Saito et al., 2001](#); [Nishimura et al., 2003](#)

**According to the CDC,  
if current trends continue,  
1 in 3 Americans will develop diabetes  
sometime in their lifetime,  
and those with diabetes will lose,  
on average, 10–15 years of life.**

2009 At a Glance  
The Center for Disease Control and Prevention

both diseases already discussed in previous studies.”

According Sara Grossi, D.D.S., Clinical Professor of Oral Biology at the University of Buffalo, following the results of two research studies she supervised in 1998 and 2002, “Periodontal disease may be the most important of all the factors known to contribute to diabetes onset, including age, gender, obesity and smoking.”

After reviewing the study’s results, Stuart Weiss, MD, assistant clinical professor of endocrinology at the NYU School of Medicine, still contended that both diseases were caused by an increase in pro-inflammatory cytokines (based on his own clinical observations). However, this study highlighted the theory that either disease, managed poorly, may trigger or multiply the negative effects of the other. “The stress of periodontal disease can lead to a release of chemical mediators that increase inflammation, and the stress of poorly maintained diabetes can make the body more vulnerable to infections and worsening of periodontal disease,” said Weiss.

## IN SUM

The study by Demmer, Desvarieux, et al added significant data to the argument that oral disease may lead to diabetes.

As to the question of whether the results met the goal of providing definitive evidence of the precise causal relationship between oral disease and diabetes, Demmer may have said it best when he warned researchers to be cautious about the study’s findings. While this study appears to show the strongest proof yet that oral disease – particularly periodontal disease and xerostomia – may lead to diabetes, the precise factors have not been uncovered.

Demmer and Desvarieux are now embarking on a new study to determine to what degree known oral pathogens increase risk for progression to diabetes. In addition, Nishimura and Murayama of the Okayama University Dental School continue their work to pinpoint the role of pro-inflammatory cytokines such as TNF- $\alpha$ , IL-1, and IL-6 in the development of both diabetes and periodontitis.

### Find out more:

- <http://www.dentistryfordiabetics.com/gallery.php>
- <http://www.dentistryfordiabetics.com/directory.php>

1. Chester Douglass. Risk assessment and management of periodontal disease J. Am Dent Assoc. 2006. Vol 137, No suppl\_3, 27S-32S.
2. Selwitz RH, Pihlstrom BL. How to lower risk of developing diabetes and its complications: recommendations for the patient. JADA 2003;134(supplement 1):54S-58S.
3. Vernillo AT. Dental considerations for the treatment of patients with diabetes mellitus. JADA 2003;134(supplement 1):24S-33S.
4. Moore PA, Zgibor JC, Dasanayake AP. Diabetes: a growing epidemic of all ages. JADA 2003;134(supplement 1):11S-15S.

From:

To: