

Diabetes and the Dentist's new role in Recognition and Screening: A1c in-office testing as a new ADA procedure code (D0411)

By Daniel G. Pompa, DDS

Introduction

Diabetes Mellitus (DM) is a chronic hormonal metabolic disorder characterized by chronic hyperglycemia. This results from deficiencies in insulin secretion and/or the inability of receptor cells to utilize the insulin that is secreted by the pancreas.¹

Insulin is required for the metabolism of carbohydrates, fats, and proteins. When there is a deficiency of insulin or its inability to function, there are multiple target organs that are damaged leading to their dysfunction and potential failure. Diabetes affects more than 10% of the U.S. population and is rising at a dramatic rate. Of these 30 million people, one-third are not diagnosed.² Presently, there are almost 100 million people in the U.S. that are pre-diabetic and most are unaware of this diagnosis.³

Insulin Resistance is a term used for the pre-diabetic state defined by an Impaired Fasting Glucose (over 100 mg/dl) plus Impaired Glucose Tolerance (over 140 mg/dl). Fifteen percent of adults in the U.S. have insulin resistance⁴ with the pre-diabetic state defined as A1c levels between 5.7% and 6.4% on two separate occasions. The early diagnosis of pre-diabetes is essential for the prevention of diabetes complications.⁵ On average, diabetes will lower life expectancy by 13 years. This is especially true when both pre-diabetes and diabetes are not diagnosed early.

Diabetes is more prevalent today than in the past. It is now considered a pandemic throughout the world. Two-thirds of all adults in the U.S. are overweight and half of those are considered obese. In the near future, almost half of all Americans will be pre-diabetic. "Sugar is now considered to be the tobacco of the New Millennium."⁶

More people have died from diabetes since 1900 than in all the wars and conflicts in the same time period. Because diabetes takes ten or more years to discover and the complications develop so slowly, it is not addressed with the level of commitment and interest it should be given.⁶

Dentists will now be able, with a simple in-office screening test, to detect diabetes as well as pre-diabetes. With a medical referral, a full workup, an evaluation for

treatment can be initiated. Dentists see more people today than physicians. The many complications associated during this pre-diabetic stage may possibly be avoided leading to a greater quality of life and longevity for these patients that were unaware of their pre-diabetic or diabetic status. This could result in significant savings to our healthcare system where we are now spending over 250 billion dollars in Medicare costs for patients with diabetes.⁷

Delta Dental has done studies where they reimbursed for the A1c testing in dental offices in NJ and may be considering covering this in the future. Other dental insurance companies have not as of yet approved a reimbursement for this ADA procedure code, but hopefully will do so in the future. Before starting a A1c in-office point of care program, be sure to consult with regulatory experts and your local dental society.

D0411: HbA1c: In - office point of service testing

As of January 1, 2018, dentists will be able to test A1c levels in their office, by offering a simple in-office test.

CDT 2018 marked the addition of "D0411 HbA1c in-office point of service testing" – a chair-side screening procedure that, along with appropriate referral, aids in the diagnosis of pre-diabetes and diabetes. This procedure, also known as finger-stick random capillary HbA1c glucose testing, is relevant to dentists as diabetes is a risk factor related to periodontal disease.

Hb1Ac testing enables a dentist to amend the patient's treatment planning depending on whether the results are the first indicator of a new diabetic condition, or if the results indicate a change in the existing diabetic condition.

D0411 – ADA Guide to Point of Care Diabetes Testing and Reporting is available at no cost for you to view or download.

• [Guide to Reporting D0411 \(PDF\)](#)

A1c levels can be falsely elevated when there is low red blood cell (RBC) turnover, as in untreated iron deficiency or anemia and can be falsely depressed with increased

RBC turnover such as in hemolysis, recently treated iron, B12 or folate deficiencies, with hemodialysis, and with RBC transfusions.

The test is limited to a three-month look back because the lifespan of a RBC is approximately 4 months (117 days for men and 106 days for women). Since RBC's do not undergo lysis at the same time, the HBA1c is taken as a limited measure of three months. It is formed as a non-enzymatic glycation pathway of hemoglobin's exposure to plasma glucose. The glucose levels on days nearer to the test contribute substantially more to the test than glucose levels days further from the test date. Since pre-diabetes has no consistent signs and symptoms, the A1c test is the most reliable test that is easily available today. In addition, A1c testing does not require a fasting state.

People without diabetes usually have an A1C level of between 4.5% to 5.6%. For every 1% decrease in A1c levels, the incidence of complications from diabetes decreases up to 40%. Ideally, a diabetic patient with an A1c level of 8.5% who can get to 6.5% can reduce their complication rate by up to 80%.⁷

The American Diabetes Association now suggests that **all adults** who are overweight or obese be tested, along with anyone who has one or more risk factors for diabetes, such as high blood pressure or close family members who have diabetes. **At age 45**, all adults should be screened for pre-diabetes or diabetes.

Dentists can often be at the forefront of detecting the early signs of the disease just by observing how patients heal after a surgical procedure. Poor or delayed healing is a first sign of diabetes or pre-diabetes. This, along with early periodontal disease in a young patient, is another red flag that should heighten your index of suspicion to rule out pre-diabetes and diabetes.

Other possible dental manifestations of DM include:

- Granulomatous polyps on the gingiva
- Candidiasis
- Parotid gland enlargement
- Taste impairment
- Xerostomia

continued on next page

Traumatic ulcers
 Geographic tongue
 Burning mouth syndrome
 Fissured tongue
 Benign migratory glossitis
 Lichen planus
 Angular cheilitis
 Delayed healing
 Hypo-salivation

Periodontal disease in diabetic patients may be more severe and progress more rapidly due to the associated impaired immunity and healing challenges.⁸ This is due, in part, to the hyperglycemia and ketoacidosis that changes the phagocytotic activity of the macrophages and the chemotactic effect of polymorphonuclear neutrophils.⁹

As dentists, we have a unique opportunity to detect these many early warning signs that may lead to an early diagnosis and now, with the addition of this new code for in-office testing for A1c, an even greater opportunity to help in the fight against diabetes.

Three important considerations when treating diabetic patients:

1) Hypoglycemia Unawareness

Over time, repeated episodes of hypoglycemia can lead to *hypoglycemia unawareness*. The body and brain no longer produce signs and symptoms that warn of low blood sugar, such as sweating, shakiness, or irregular heartbeats. When this happens, the risk of severe, life-threatening hypoglycemia is increased. If this occurs in the dental office, it can be a crisis as the dentist has no warning of the impending hypoglycemic event before the patient becomes unconscious. A thorough history is required to determine if your patient with DM may present with this sign of hypoglycemia. Your “situational awareness” should be heightened especially if your patient is a recently diagnosed diabetic Type II, is not compliant with medications or lifestyle changes, and has experienced frequent hypoglycemic episodes.

2) Diabetic Patients on Beta Blockers

Diabetic patients on beta blockers will not necessarily show sweating and shaking as the beta blockers will prevent this. These patients may develop altered consciousness or loss of consciousness without prior warning just like patients with hypoglycemia unawareness.

3) New Diabetic Medications (Alpha Glucosidase Inhibitors) and how they affect the treatment of diabetic patients showing signs and symptoms of hypoglycemia

Today we have a new class of diabetic

drugs called Alpha-Glucosidase Inhibitors: Glyset (Miglitol) and Precose (Acarbose).

With the recognition of hypoglycemia, the common use of orange juice (fructose) or candy (sucrose) will not reverse the altered consciousness and, may, in fact, result in the patient going into a full loss of consciousness (LOC).

This is because these medications act by prolonging the time for the breakdown of fructose and sucrose. Therefore, the best form of sugar to give to patients on these medications is “Glucose Gel.” This should be in the emergency kit of all dentists.

Diabetic patients in an altered consciousness state may be difficult to reason with (due to the lack of glucose going to the brain) and, as such, you must be firm and assertive with their taking the Glucose gel or other forms of sugar. You may consider saying, “Take this now and we can argue later.”

Having a heightened index of suspicion when a diabetic patient is exhibiting signs and symptoms of hypoglycemia is critical to preventing a crisis situation from developing. If a diabetic patient exhibits an altered consciousness and is given sugar in a form that is consistent with their medication and history, a blood sugar level should be taken. If the patient and the dentist are comfortable then the dental treatment for that visit may proceed. However, if a longer procedure is scheduled, then consideration should be given for a more complex carbohydrate like peanut butter and crackers.² If there is any question prior to starting treatment, a glucometer should be used to check the patient’s blood glucose levels. Having a glucometer in the dental office is also recommended to rule out the cause of any seizure as being hypoglycemic in origin. Most drug stores today offer their own brand glucometers that contain up to 10 free test strips to make the testing complete. These are inexpensive and are usually under \$30.

What is the best time of the day to treat diabetic patients?

Morning appointments are preferred because this is the time of high glucose and low insulin activity, thus reducing the risk of hypoglycemia. In addition, this is the time we produce the most amount of cortisol which results in a heightened ability to deal with stress.

Diabetes.org is an excellent source of information for the patient and the practitioner regarding hypoglycemia.²

References

1. 2017 White Paper by University of California, Berkeley School of Public Health. Suneil Koliwad, MD., PhD. 2017.
2. Diabetes and the Dental Patient: John Hardeman, MD, DDS, Dentistry Today, May 2017, pages 111-114.
3. Centers for Disease Control and Prevention. National diabetes statistics report, 2017. Centers for Disease Control and Prevention website. www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf (PDF, 1.3 MB) . Updated July, 18 2017. Accessed August 1, 2017.
4. Rao SS: Impaired Glucose Tolerance and impaired fasting glucose, Amer Fam Physician 69:1961-1968,2004.
5. Teeuw, W. (2017) Periodontitis as a possible early sign of Diabetes Mellitus; British Medical Journal: Open Diabetes Research and Care 2017;5:e000326. doi:10.1136/bmjdr-2016-000326.
6. Taubes, G. (2017) The Case Against Sugar: Alfred A. Knopf, New York.
7. Economic cost of Diabetes in the U.S., Diabetes Care, 2013;36;1033-1046, June, 1, 2013.
8. Personal communication with Dr. Tom Viola at the GNYDM on Nov. 26, 2017.
9. The American Academy of Oral Medicine: Diabetes Mellitus. March 3, 2017.
10. Vasconcelos BC, Prevalence of oral mucosa lesions in Diabetic patients: a preliminary study: Braz J Otorhinolaryngol 2008;74:423-428.



After graduating from New York University College of Dentistry in 1978, Dr. Daniel G. Pompa completed a General Practice Residency at Long Island Jewish Hospital, followed by specialty training in Oral and Maxillofacial Surgery at Lincoln Hospital, New York Medical College. In 1982, he became a Fellow of The American Association of Oral and Maxillofacial Surgeons and in 1992 a Fellow in The International Congress of Oral Implantologists. Dr. Dan Pompa has been a guest lecturer at Columbia University College of Dental Medicine and New York University College of Dentistry and is now a guest faculty at NYU College of Dentistry and the University of Florida College of Dentistry. Dr. Pompa has lectured extensively, including at the Academy of Osseointegration, the International Interdisciplinary Congress on Craniofacial and Skull Base Surgery, and has presented at the annual Greater New York Dental Meeting numerous times throughout the years. In November 2013, Dr. Pompa became a Seminar Series Speaker/Consultant for the American Dental Association. More information about him is available at www.APS4DDS.com.