Oral Health Fact Sheet for Dental Professionals

Adults with Type 2 Diabetes

Type 2 Diabetes ranges from predominantly insulin resistant with relative insulin deficiency to predominantly an insulin secretory defect with insulin resistance, American Diabetes Association, 2010. (ICD 9 code 250.0)

Prevalence

- 23.6 million Americans have diabetes – 7.8% of U.S. population. Of these, 5.7 million do not know they have the disease.
- 1.6 million people ≥ 20 years of age are diagnosed with diabetes annually.
- 90–95% of diabetic patients have Type 2 Diabetes.

Manifestations

Clinical of untreated diabetes

- High blood glucose level
- Excessive thirst
- Frequent urination
- Weight loss
- Fatigue

Oral

- Increased risk of dental caries due to salivary hypofunction
- Accelerated tooth eruption with increasing age
- Gingivitis with high risk of periodontal disease (poor control increases risk)
- Salivary gland dysfunction leading to xerostomia
- Impaired or delayed wound healing
- Taste dysfunction
- Oral candidiasis
- Higher incidence of lichen planus

Other Potential Disorders/Concerns

- Ketoacidosis, kidney failure, gastroparesis, diabetic neuropathy and retinopathy
- Poor circulation, increased occurrence of infections, and coronary heart disease

Management

Medication

The list of medications below are intended to serve only as a guide to facilitate the dental professional's understanding of medications that can be used for Type 2 Diabetes. Medical protocols can vary for individuals with Type 2 Diabetes from few to multiple medications.

ACTION	TYPE	BRAND NAME/GENERIC	SIDE EFFECTS
Enhance insulin secretion	Sulfonylureas	*Glipizide* (Glucotrol) *Glyburide* (DiaBeta, Glynase, Micronase) *Glimepiride* (Amaryl) *Tolazamide* (Tolinase, Diabinese, Orinase)	Angioedema Fluconazoles may increase the hypoglycemic effect of glipizide and glyburide. Corticosteroids may produce hyperglycemia. Floxin and other fluoroquinolones may increase the hypoglycemic effect of sulfonylureas.

Adults with Type 2 Diabetes continued

ACTION	TYPE	BRAND NAME/GENERIC	SIDE EFFECTS
Enhance insulin secretion *continued*	Sulfonylureas		NSAIDs and salicylates may increase hypoglycemic effect of sulfonylureas. Glimepiride-tetracyclines may cause hypoglycemia.
		Combination *Glyburide+Metformin* (Glucovance) *Glipizide+Metformin* (Metaglip)	See individual medications
	Meglitinides	*Repaglinide* (Prandin) *Nateglinide* (Starlix)	Stevens-Johnson syndrome. Repaglinide should not be prescribed with ketoconazole, itraconazole, fluconazole, erythromycin, and clarithromycin (Biaxin); interaction may cause dangerous hypoglycemia. Floxin and other fluoroquinolones, NSAIDs, and salicylates may increase the hypoglycemic effect.
		Combination *Repaglinide+Metformin* (PrandiMet)	See individual medications
	DPP-4 Inhibitors	*Sitagliptin* (Januvia)	Angioedema Floxin and other fluoroquinolones may increase the hypoglycemic effect.
		Combination *Sitagliptin+Metformin* (Janumet)	See individual medications
Reduce hepatic glucose production	Biguanides	*Metformin* (Glucophage, Fortamet, Glumetza, Riomet)	Angioedema, metallic taste in mouth Floxin and other fluoroquinolones may increase the hypoglycemic effect. Corticosteroids may produce hyperglycemia.
		Combination *Metformin+Repaglinide* (Prandimet) *Metformin+Rosiglitazone* (Avandamet)	See individual medications
	Thiazoli-dinediones	*Pioglitazone* (Actos) *Rosiglitazone* (Avandia)	Tooth disorders including generalized tooth pain (5%). Angioedema, myalgia, sinusitis, Stevens-Johnson syndrome. Floxin and other fluoroquinolones may increase the hypoglycemic effect.

ACTION	TYPE	BRAND NAME/GENERIC	SIDE EFFECTS
Delay glucose absorption	Alpha-glucosidase inhibitors	*Acarbose* (Precose) *Miglitol* (Glyset)	Floxin and other fluoroquinolones may increase the hypoglycemic effect. Corticosteroids may produce hyperglycemia.
Lower blood sugar	Incretin mimetics	*Exenatide* (Byetta)	Angioedema, reduces the absorption of drugs taken orally; administer oral medications one hour before exenatide is administered. Floxin and other fluoroquinolones may increase the hypoglycemic effect.
	Amylinomimetics	*Pramlintide* (Symlin)	Always used with insulin. Floxin and other fluoroquinolones may increase the hypoglycemic effect.
	Insulin		Floxin and other fluoroquinolones may increase the hypoglycemic effect.

Salicylates, NSAIDs, and ketoconazole can increase the hypoglycemic effect of most of the above medications.

Local anesthetic with epinephrine 1:100,000 can be used in well-controlled diabetics, but in diabetic patients with hypertension, post Myocardial Infarction caution may be indicated as epinephrine has a pharmacologic effect opposite of insulin.

Dental Treatment and Prevention

- Ensure glycemic control at appointment time. Review recent diabetes control with patient, Hemoglobin A1c (HbA1c) <7 indicates good control in previous 3 months, >8 indicates poor control.
- Ask patient for medication updates at each appointment. Medication changes can affect the appropriate care of the patient from a medical and/or appointment management standpoint.
- Have a source of glucose readily available in the office.
- Schedule short morning appointments. Ensure that the patient has eaten a meal and taken usual medication prior to treatment.
- Monitor vital signs at appointments. Patients with abnormal pulse rate and/or elevated blood pressure should be approached with caution. Overall poor physical status increases the risk of complications during and after dental treatment.
- Monitor oral disease progression, oral hygiene, diet, and smoking habits frequently. Consider increased recall and periodontal maintenance frequency. Treat periodontal disease aggressively. Periodontal disease can significantly worsen diabetes and associated cardiac disease.
- Consult with patient's physician before surgical procedures as insulin dosage may need to be adjusted and post operative diet may need to be altered.
- In patients with candidiasis, prescribe sugar-free Nystatin (clotrimazole troches typically contain sugar and should be avoided).
- For patients with recurrent HSV infection, management with systemic and topical medications is indicated to decrease frequency and duration of infection. Increased oral comfort will improve patient's ability to manage diabetes through diet.

- Consider antibiotic coverage for invasive dental procedures for those with poorly controlled diabetes since there may be increased risk of infection and delayed wound healing. Consultation with the patient's treating physician is recommended. Treat oral infection (such as recurrent HSV) and ulceration aggressively as increased oral comfort will improve the patient's ability to manage their diabetes through diet.
- Provide tobacco prevention and cessation education. People with diabetes who smoke are 20 times more likely to develop periodontitis.

Hypoglycemic episode:
Symptoms include mood changes, hunger, weakness, and decreased spontaneity leading to tachycardia, sweating, and incoherence. If occurs, terminate dental treatment immediately and administer 15 grams of fast-acting carbohydrate (1/2 can of regular soda, 4 oz fruit juice, or 3–4 glucose tablets). Monitor blood glucose after treatment to determine if additional carbohydrate is necessary. If patient is unable to swallow or loses consciousness, seek medical assistance and administer 1 mg glucagon IM or subcutaneously.

As needed for patients with xerostomia:

- Educate on proper oral hygiene (brushing, flossing) and nutrition.
- Recommend brushing teeth with a fluoride containing dentifrice before bedtime. After brushing, apply neutral 1.1% fluoride gel (e.g., Prevident 5000 gel) in trays or by brush for 2 minutes. Instruct patient to spit out excess gel and NOT to rinse with water, eat or drink before going to bed.
- Recommend xylitol mints, lozenges, and/or gum to stimulate saliva production and caries resistance.

Additional information: Special Needs Fact Sheets for Providers and Caregivers

---

References

- Skamagas, M., Breen, T.L., LeRoith, D. (2008) Update on diabetes mellitus: prevention, treatment, and association with oral diseases. Oral Dis, 14(2):105–114.
- Vernillo, A.T. (2003) Dental considerations for the treatment of patients with diabetes mellitus. J Am Dent Assoc, 134: 24S–33S.
- Little, J.W., Falace, D.A., Miller, C.S., Rhodus, N.L. Diabetes Mellitus. Chapter 15 in Dental Management of the Medically Compromised Patient, 7th edition. Mosby Elsevier, St. Louis, MO, 2008, pp. 212–235.
- Kidambi, S., Patel, S.B. (2008) Diabetes mellitus: considerations for dentistry. J Am Dent Assoc 139;8S–18S.
- Ship, J.A. (2003) Diabetes and oral health: An overview. J Am Dent Assoc, 134(1): 4S–10S.
- Mealey, B.B. (2006) Periodontal disease and diabetes. J Am Dent Assoc, 137(2): 26S–31S.
- NIH Institute for Diabetes
- National Diabetes Education Program NIH Facts

Additional Resources

- NIH Institute for Diabetes
- National Diabetes Education Program
- American Diabetes Association
- International Diabetes Federation Information for Health Professionals
- Drugs Affecting Blood Glucose Levels

Washington State Department of Health
DOH 160-15 March 2012

Fact sheets developed by the University of Washington DECOD (Dental Education in the Care of Persons with Disabilities) Program through funding provided to the Washington State Department of Health Oral Health Program by HRSA grant #H47MC08598).

SCHOOL OF DENTISTRY
UNIVERSITY of WASHINGTON

PUBLIC HEALTH
ALWAYS WORKING FOR A SAFER AND HEALTHIER WASHINGTON

For persons with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TTY/TDD 1-800-833-6388).