

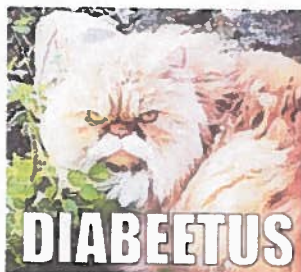
Type 1, Type 2, and YOU!

Treating Your Diabetic Patient

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Objectives

- Overview of diabetes as a disease (types and complications)
- Pharmacology overview (anti-diabetics)
- Nutrition counseling
- Diabetic emergencies
- Periodontal disease and diabetes correlation



The Harsh Reality A Global Epidemic

In 2010...

- The CDC reported that 25.6 million (11.3%) of all Americans aged 20 or older were diabetic or undiagnosed diabetic.
- 79 million were pre-diabetic.
- By 2050, it is estimated that 33% of the American population will have some form of diabetes.
- It is the 7th leading cause of death in the U.S.
- An estimated \$174 billion is spent annually on diabetes treatment.

What is Diabetes?

Diabetes mellitus is a metabolic disease characterized by an abnormal level of glucose in the blood caused by the lack of insulin production or the body's resistance to utilize insulin.

Insulin is a hormone that is made in the pancreas and transports glucose from the bloodstream into the muscles for energy production.

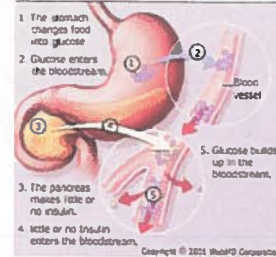
Types of Diabetes

- Type 1 Diabetes – "Juvenile Diabetes"
- Type 2 Diabetes – "Adult Onset Diabetes"
- Gestational Diabetes

Type 1 Diabetes

- Account for approximately 5-10% of all cases of DM.
- Typically affects children and young adults.
- Caucasians tend to have the highest rates of DM Type 1
- Characterized as an autoimmune disease and complete inability of the pancreas to secrete insulin.
 - These individuals are insulin-dependent and must inject insulin or use an insulin pump.
 - At risk for ketoacidosis if left untreated and lead to coma or death.

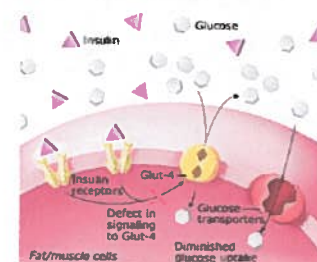
Type 1 Diabetes



Type 2 Diabetes

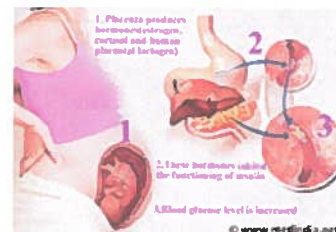
- Account for approximately 90-95% of all cases of DM.
- Tends to occur in older individuals, but there is a current growing trend of development in adolescents and young adults due to poor diet, obesity, and physical inactivity.
- African Americans, Hispanic/Latino Americans, American Indians, some Asian Americans, and Pacific Islanders are at particularly high risk.
- Characterized first as a form of insulin resistance and then a gradual inability for the pancreas to produce insulin.

Type 2 Diabetes: Insulin Resistance



Gestational Diabetes

- A form of glucose intolerance during pregnancy.
- Most common among African Americans, Hispanic/Latino Americans, American Indians, obese women, and those with a family history of diabetes.
- To avoid pregnancy complications, the mother is treated with medication, usually insulin injections.
- 5-10% of women develop Type 2 DM immediately after pregnancy and others have a 40-60% chance of developing Type 2 DM in the next 5 to 10 years.



Tell-Tale Signs of Diabetes

Three classic signs:

- Polyuria – excessive excretion of urine
- Polydipsia – excessive thirst
- Nocturia – excessive urination at night

Other Signs of Diabetes

Other subtle signs of diabetes include:

- Unexplained weight loss (usually early on in the disease stage)
- General fatigue
- Increased infections
- Leg cramps
- Parasthesia of fingers and toes
- Impotence
- Blurred vision

Often overlooked contributing to high number of undiagnosed cases

Who is at Risk? EVERYONE!

Common risk factors:

- Age greater than 45
- Obesity
- Family history of Type 2 diabetes
- Racial
- Hypertension
- History of cardiovascular disease
- Physical inactivity
- Dyslipidemia
- Polycystic ovarian syndrome

Diagnosing Diabetes

- Based on clinical history, comprehensive examination, and blood glucose assays.
- A positive diagnostic test should be followed by a repeated test on a different day to confirm the clinical diagnosis.

TABLE 1: ADA Criteria for Diagnosis of Diabetes for Type 2 2010 Update

	Fasting Plasma Glucose	Oral Glucose Tolerance Test
PPG*	126 mg/dL or higher	200 mg/dL, oral over 2 hours
C GTT* after 2 hours	200 mg/dL or higher	200 mg/dL, oral over 2 hours
A1C†	6.5% or higher	6.5% or higher

*PPG and C GTT guidelines for GDM are different. †A1C does not apply to diagnosis of type 1 diabetes or to GDM.

Complications of Diabetes

- Nephropathy
 - kidney disease
- Retinopathy
 - disease of the retina
- Neuropathy
 - nervous system dysfunction: muscle pain, tingling, loss of feeling
- Peripheral Vascular Disease
 - blood flow through veins and arteries distal to heart: gangrene, thrombophlebitis
- Coronary Artery Disease
- Severe Oral Health Complications
 - periodontitis, dental caries, oral mucosal lesions, burning mouth syndrome, xerostomia and tooth loss.

Treatment of Diabetes

- There is no cure!
- Treatment is multifaceted and includes:
 - Oral medications/insulin
 - Nutritional counseling
 - Regular monitoring of blood glucose levels
 - Regular exercise
 - Target weight management
 - Sometimes gastric bypass surgery and pancreatic transplant

Warning: Watch for High Doses of Metformin!

- Doses of 5,000mg or more can be dangerous or even fatal in adults. High doses are frequent, and overdoses are more common than you might think!
- Metformin comes in immediate release or extended release tablets. If health care professionals are not careful, an overdose of extended release tablets can be lethal.

Side Effects of Medication

- Increased risk of hypoglycemia
- Metformin may alter taste
- Nausea, vomiting, diarrhea
- Monitor for diabetic medical emergencies

Nutritional Counseling for Diabetics

Myths and facts about diabetes and diet

MYTH: You must avoid sugar at all costs.

Fact: The good news is that you can enjoy your favorite treats as long as you plan properly. Dessert doesn't have to be off limits, as long as it's a part of a healthy meal plan or combined with exercise.

MYTH: A high-protein diet is best.

Fact: Studies have shown that eating too much protein, especially animal protein, may actually cause insulin resistance, a key factor in diabetes. A healthy diet includes protein, carbohydrates, and fats. Our bodies need all three to function properly. The key is a balanced diet.

MYTH: You have to cut way down on carbs.

Fact: Again, the key is to eat a balanced diet. The serving size and the type of carbohydrates you eat are especially important. Focus on whole grain carbs since they are a good source of fiber and they are digested slowly, keeping blood sugar levels more even.

MYTH: You'll no longer be able to eat normally. You need special diabetic meals.

Fact: The principles of healthy eating are the same—whether or not you're trying to prevent or control diabetes. Expensive diabetic foods generally offer no special benefit. You can easily eat with your family and friends if you eat in moderation.

(Fiber-rich carbs don't digest as fast. Fiber is what you want to eat.)	
Instead of...	Try these high-fiber options
White rice	Brown rice or wild rice
White potatoes (including fries and mashed potatoes)	Sweet potatoes, yams, winter squash, cauliflower mash
Regular pasta	Whole-wheat pasta
White bread	Whole-wheat or whole-grain bread
Sugary breakfast cereal	High-fiber breakfast cereal (Kashi Bran, etc.)
Instant oatmeal	Steel-cut oats or rolled oats
Confectioneries	Bran flakes
Corn	Peas or leafy greens

8 principles of low-glycemic eating

1. Eat a lot of non-starchy vegetables, beans, and fruits such as apples, pears, peaches, and berries. Even tropical fruits like bananas, mangoes, and papayas tend to have a lower glycemic index than typical desserts.
2. Eat grains in the least-processed state possible ("unrefined"), such as whole wheat bread, brown rice, and whole barley, millet, and wheat berries, or a minimally processed, such as stone-ground whole, stone-rolled oats, and nutty or quinoa or millet (quinoa) cereals.
3. Limit white potatoes and refined grain products such as white breads and white pasta to small side dishes.
4. Limit concentrated sweets—including high-calorie foods with a low glycemic index, such as ice cream—in occasional treats. Reduce fruit juice to no more than one cup a day. Completely eliminate high-fructose corn syrup.
5. Eat a handful type of protein at most meals, such as beans, fish, or skinned chicken.
6. Choose foods with healthy fats, such as olive oil, nuts (almonds, walnuts, pecans), and avocados. Limit saturated fats from dairy and other animal products. Completely eliminate partially hydrogenated fats (trans fats), which are in fast food and many packaged foods.
7. Have three meals and one or two snacks each day, and don't skip breakfast.
8. Eat slowly and stop when full.

Tricks for cutting down on sugar

- **Reduce how much so it drinks, soda and juice you drink.** A recent study found that for each 12 oz. serving of a sugar-sweetened beverage you drink a day, your risk for diabetes increases by about 15 percent. If you mix your carbonation with sparkling water with a touch of lemon or lime or a splash of fruit juice. Reduce the amount of creamers and sweeteners you add to tea and coffee drinks.
- **Sweeten foods yourself.** Buy unsweetened iced tea, plain yogurt, or unflavored oatmeal, for example, and add sweetener (or fruit) yourself. You're likely to add far less sugar than the manufacturer would have.
- **Reduce the amount of sugar in recipes by 1/3 to 1/2.** If a recipe calls for 1 cup of sugar, for example, use 2/3 or 1/2 cup instead. You can also boost sweeteners with cinnamon, nutmeg, or vanilla extract.
- **Find healthy ways to satisfy your sweet tooth.** Instead of ice cream, blend up frozen bananas for a creamy frozen treat. Or enjoy a small chunk of dark chocolate, rather than your usual milk chocolate bar.
- **Start with half of the dessert you normally eat,** and replace the other half with fruit.

Proceed with caution when it comes to alcohol

It's easy to underestimate the amount of calories and carbs in alcoholic drinks, including beer and wine. And cocktails mixed with soda and juice can be loaded with sugar. If you're going to drink, do so in moderation (no more than 1 drink per day for women, 2 for men). Choose calorie-free drink mixers, and drink only with food. If you're diabetic, always monitor your blood glucose. As alcohol can interfere with diabetes medication and insulin.

Ways to reduce unhealthy fats and add healthy fats:

- Cook such as stir or instead of butter or vegetable oil.
- Trim any visible fat off of meat before cooking and remove the skin before cooking chicken and turkey.
- Instead of chips or crackers, try snacking on nuts or seeds. Add them to your morning cereal or have a little handful for a filling snack. Nut butters are also very satisfying and full of healthy fats.
- Instead of frying, choose to grill, broil, bake, or stir-fry.
- Serve fish 2 or 3 times a week instead of red meat.
- Add avocado to your sandwiches instead of cheese. This will keep the creamy texture, but improve the health factor.
- When baking, use canola oil or apple sauce instead of shortening or butter.
- Rather than using heavy cream, make your soups creamy by adding low-fat milk thickened with flour, pureed potatoes, or reduced-fat sour cream.

Diabetic Emergencies

- **Hypoglycemia**
 - Most common metabolic emergency
 - Results from excess of insulin and deficiency of glucose in the body
 - Signs and symptoms are confusion, blurred vision, stupor, convulsions, headache, sweating, anxiety, nausea, dizziness
 - Treated by ingesting glucose, sweet drinks, or milk
 - It is important that your office has glucose tabs or glucose frosting in case of emergency
- **Lactic Acidosis**
 - low pH in the body tissues and blood accompanied by the build up of lactate and occurs when cells receive too little oxygen (such as after vigorous exercise).
 - Signs and symptoms are deep and rapid breathing, vomiting and abdominal pain
 - Side effect of high doses of Metformin.
 - Call 911, this must be treated in the emergency room

Diabetic Emergencies

Also, because these patients tend to be on other medications to treat hypertension and high cholesterol, watch for signs of:

- Myocardial Infarction (heart attack)
- Stroke

Also watch for delayed wound healing or infection due to poor healing response.

Diabetes: A Healthcare Professional Collaboration

Dental hygienists, dentists, optometrists, podiatrists, endocrinologists, diabetes educators, and family care providers/physicians need to support each other in their efforts and reinforce key concepts of diabetes care regularly to help their patients achieve successful health outcomes!

Diabetes and Periodontal Disease A Vicious Circle

- Poor glycemic control in patients with diabetes is related to increased severity of periodontal disease.
- Severe periodontal disease can result in poor glycemic control and other complications.



Recent Stats from 2011 Survey

The following are statistics from a study performed with 443 adult patients at the University of Michigan in 2011

- Patients with diabetes missed on average 11.44 teeth due to caries, while patients not diagnosed with diabetes missed on average 6.94 teeth due to caries.
- Patients with diabetes has on average 14.93 teeth extracted compared to the patients not diagnosed with diabetes who had only 10.47 teeth extracted.
- 4.1% of patients with diabetes never brushed their teeth and 11% rarely brushed. Of the patients not diagnosed with diabetes, only 0.6% never brushed and 1.9% rarely brushed.
- 72.6% of patients with diabetes brushed at least once per day compared to 87.6% of patients not diagnosed with diabetes.
- Of the patients with diabetes who did not brush regularly, 60.29% had lower than 4mm pockets and 34.10% had 4-6mm pockets compared to diabetics who brushed regularly who had 81.57% lower than 4mm pockets and only 16.73% between 4-6mm pockets.

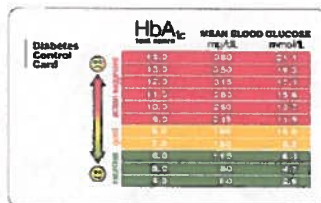
Point-of-Care Diabetes Screening of Dental Patients

- According to the CDC, 61% of U.S. citizens aged 18-64 visited a dentist in 2010.
- According to NHANES survey on diabetes and periodontal disease, individuals with moderate or severe PD who never were reported to have been diagnosed with diabetes, 93% met American Diabetes Association criteria for high diabetes risk and could have benefited from screenings.
- Dentists and Dental Hygienists are perfectly positioned to screen patients for possible diabetic status.
- Early detection of pre-diabetes or diabetes may slow or prevent complications of diabetes, including periodontal disease.
- Recognizing the risk factors of diabetes and periodontal disease.
- Recognizing if the patient already has diabetes and if it is well controlled, ask for latest HbA1c levels.
- Point-of-Care chair-side HbA1c screenings, glucose meter in office.

What is HbA1c?

- Hemoglobin, which is found in red blood cells, links with the glucose in the blood to become glycated (sugar-coated). Once glycated, the hemoglobin will stay glycated for the entire lifespan of the red blood cell, approximately 120 days.
- Ex. An HbA1c level of 9% means that 9% of hemoglobin molecules are glycated.
- People without diabetes have approximately a 5% reading.
- Keeping the HbA1c level in diabetic patients less than 7% helps lower the risk for complications of diabetes.

Ask every diabetic patient, "What is your latest HbA1c level and when was it drawn?"



Knowledge of the People...

- In a U.S. study, 30% of 253 individuals with diabetes did not know that people with diabetes are more likely to have gum disease and that diabetes could make the condition of one's teeth and gums worse.
- In another U.S. study involving 390 patients with diabetes, it was found that only 18.2% recognized that their oral health might be affected by diabetes.

Power of the Dental Hygienist

- Dental hygienists are in a unique position to educate their patients and to reinforce diabetes-related knowledge.
- This is especially the case due to their regular involvement with periodontal patients who are seen several times each year for periodontal maintenance and their knowledge about the oral-systemic link.
- Based on patient assessment, current diabetic status, and collaboration with other health professionals, the dental team can create a tailor-made treatment plan to manage both their periodontal status and diabetic status and achieve better healthfulness.

Enforcing Patient Compliance

Don't be shy, probe the patient for answers on their compliance!

Over 60% of persons with diabetes do not adequately control their blood glucose. Further, of those treated for hypertension and dyslipidemia, 65% and 49% respectively were unable to reach target blood pressure and cholesterol levels.

Update medical histories regularly, ask for HbA1c levels, offer nutritional counseling, ask questions about their diet and exercise, ask about drug compliance and any side effects, urge frequent and longer recall appointments and stay current with continuing education on the ever-changing topic of diabetes!

Questions??



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Thank You!