



CE Course Handout

"Sugar, You're (Not So) Sweet" An Overview of Diabetes Mellitus, Dental Considerations and Patient Care Planning

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American
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Association



TOM VIOLA
PHARMACOLOGY CE
www.thomasviola.com

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Sugar, You're (Not So) Sweet

**Dental
Considerations**

in the

**Treatment of
Diabetes Mellitus**



Contact Information

thomas.viola@gmail.com
thomasviola.com
facebook.com/ThomasViolaRPh
linkedin.com/in/thomasviola
@thomas_viola





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Program Learning Objectives

Upon successful completion of this program, participants will be able to:

- Identify the epidemiology and types of diabetes.
- Describe the pathophysiology of diabetes and its various management and treatment options.
- Describe the complex interplay of diabetes, systemic inflammation and periodontal disease
- Explain the impact of diabetes and its treatment on dental therapy

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Epidemiology

Approximately 24 million people in the United States have diabetes.

- This number is expected to double by 2025
- Over 90% of diabetic patients have Type 2 diabetes

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Epidemiology

Over 18 million people are diagnosed with an additional 6 million still undiagnosed.

- An estimated 57 million people have pre-diabetes

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Epidemiology

The long-term complications of Type 2 diabetes contribute to exceptionally high disease-related costs.

- 1 in 5 hospitalizations are related to diabetes
 - 7.7 million stays
 - \$83 billion in hospital costs
 - 23% of the hospital costs in the US

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Epidemiology

Direct and indirect costs associated with diabetes in the US totaled \$174 billion in 2007.

- Average medical expenditures among people with are estimated to be 2.3 times higher than in the absence of diabetes

Epidemiology

Approximately two-thirds of patients with diabetes have co-existing hypertension, and more than half have co-existing hyperlipidemia

- Risk for death among people with diabetes is approximately twice that of people without diabetes at similar age

Diabetes Definitions

Definitions

Insulin is a hormone that is released by the beta islet cells of the pancreas.

- Insulin is a carrier protein that facilitates the transport of glucose into cells for use as energy.
- Insulin controls the amount of glucose (sugar) in the blood.

Definitions

It is a constant challenge to know how much insulin the body needs.

- There are many factors that impact blood sugar and therefore the amount of insulin the body requires at any given time of the day.

Definitions

- Factors Affecting Blood Sugar and Insulin Demand
 - Food intake and absorption
 - Stress
 - Exercise
 - Illness
 - Medications

Definitions

- Hypoglycemia
 - Symptoms include shakiness, sweating, extreme hunger, blurred vision, confusion, mood shifts.
 - If left untreated, the patient may lapse into a diabetic coma resulting in death.

Definitions

- Hyperglycemia
 - Symptoms include extreme thirst, hunger, fatigue, excessive urination, dry mouth.
 - If left untreated, may result in:
 - Kidney failure
 - Blindness
 - Nerve damage
 - Amputations
 - Heart attack
 - Stroke

Types of Diabetes

Types of Diabetes

There are a total of five different types of diabetes.

- Diabetes Insipidus
- Diabetes Mellitus Type 1
- Diabetes Mellitus Type 2
 - Gestational Diabetes Mellitus (Type 3?)
 - Pre-diabetes Mellitus (Pre-Type 2)

Types of Diabetes

Diabetes insipidus is a relatively rare condition that does not affect blood sugars.

- Caused by a deficiency of antidiuretic hormone (ADH), vasopressin, or by an insensitivity of the kidneys to that hormone
- Characterized by the inability of the kidneys to concentrate urine, which results in the excretion of large amounts of severely diluted urine.

Types of Diabetes

Diabetes Mellitus Type 1 occurs when the body is unable to make insulin.

- This form of diabetes is also called “insulin dependent” diabetes because the pancreas no longer produces any insulin.
 - Results from an autoimmune reaction which destroys pancreatic β -cells

Types of Diabetes

Diabetes Mellitus Type 1 is also known as “juvenile diabetes” since it is most often diagnosed in children, and young adults.

- It is characterized by a rapid onset of symptoms.
 - Extreme weight loss, thirst, hunger, tiredness, and excessive urination.
- Individuals diagnosed with Type 1 diabetes must receive exogenous insulin via injections or pump.

Types of Diabetes

Diabetes Mellitus Type 2 is called “non-insulin dependent” diabetes because the pancreas continues to produce insulin.

- Type 2 diabetes is also known as “adult onset” since it is most often diagnosed after 30 years of age.

Types of Diabetes

Patients with Diabetes Mellitus Type 2 are usually asymptomatic.

- Thus, up to 25% of patients who have the disease don't know it.

Types of Diabetes

Gestational diabetes mellitus develops in women during pregnancy.

- Gestational diabetes mellitus usually resolves with the delivery of the child.
- Women who experience gestational diabetes mellitus (and their offspring) are at higher risk for developing Type 2 diabetes later in life
 - 20-50% chance of developing diabetes in the next 5-10 years

Types of Diabetes

Pre-diabetes is characterized by blood glucose levels that are above normal.

- Patients diagnosed with pre-diabetes have either impaired fasting glucose or impaired glucose tolerance
- While blood glucose levels in these patients remain elevated, the levels have not yet reached those limits that are used to diagnose diabetes.

Diagnosis of Diabetes Mellitus: The “Three P’s”

The “Three P’s”

80% of blood glucose is taken up by muscle.
If the muscle is resistant to insulin, much of the glucose stays in circulation.

- When blood glucose rises above 160 to 180 mg/dL, the excess glucose is excreted into the urine.
- This sets off a cascade of events which are the hallmark of Type 2 diabetes mellitus.

The “Three P’s”

- When the level of glucose in the urine is high, the kidneys excrete extra water to dilute the large amount of glucose.
- Since the kidneys produce excessive urine, the patient urinates relatively large volumes and urinates more frequently (polyuria).

The “Three P’s”

- Due to the excessive urination, the patient experiences abnormal thirst (polydipsia).
- Because excessive calories are lost in the urine, the person loses weight.
- To compensate for the loss of calories and body weight, the person often feels excessively hungry (polyphagia).

Clinical Diagnosis of Diabetes Mellitus

Clinical Diagnosis

The diagnosis of diabetes mellitus is done via two blood tests: fasting blood sugar and oral glucose tolerance test.

- With the fasting blood sugar test, if blood glucose is ≥ 126 mg/dL after a fast of at least 8 hours, the patient is said to have diabetes.
- If blood glucose is $>$ than 100 mg/dL but less than 126mg/dL, the patient is said to have impaired fasting glucose.

Clinical Diagnosis

- With the oral glucose tolerance test, the patient drinks 75 grams of glucose in solution and the blood glucose is measured 2 hours later afterwards.
- If the blood glucose is ≥ 200 mg/dL, the patient is said to have diabetes.
- If the blood glucose is between 140 and 199 mg/dL, the patient is said to have impaired glucose tolerance.

Focus on Diabetes Mellitus Type 2 (T2DM)

Diabetes Mellitus Type 2

Diabetes Mellitus Type 2 results from pancreatic β -cell deterioration and decreased insulin production

- Pancreatic β -cells decline in numbers and mass and are unable to sustain necessary levels of insulin secretion
- Approximately 50% of β -cell function is lost by the time Diabetes Mellitus Type 2 is diagnosed

Diabetes Mellitus Type 2

Pancreatic β -Cell failure and resulting hyperglycemia result in the development of insulin resistance

- Insulin resistance is associated with:
 - Decrease in the utilization of glucose by muscle and adipose tissue
 - Ineffective suppression of glucose production in the liver

Diabetes Mellitus Type 2

β -Cells attempt to compensate for decreased insulin activity by increasing insulin production, which causes them to fail altogether

- A vicious cycle of decreasing insulin secretion and increasing insulin resistance results in the β -cells eventually “burning out”

Diabetes Mellitus Type 2

In addition to muscle, other organs and tissues contribute to the pathophysiology of Type 2 diabetes mellitus.

- Pancreatic islet alpha cells
 - Produce and secrete too much glucagon which stimulates the liver to produce glucose
- Adipose tissue
 - Produce inflammatory mediators which increase insulin resistance and thus, demand for insulin

Diabetes Mellitus Type 2

- GI
 - Secretes too little GLP-1 hormone
 - GLP-1 increases pancreatic islet cells and increases post-meal insulin production
- Liver
 - Produces too much glucose
- Brain
 - CNS insulin resistance from neurotransmitter dysfunction

Gestational Diabetes

Gestational diabetes mellitus is similar to Diabetes Mellitus Type 2 in that it also involves insulin resistance.

- Fifteen to twenty percent of pregnancies result in gestational diabetes.
- During pregnancy, hormones can cause insulin resistance in women who are already genetically predisposed to developing diabetes.

Risk Factors for Diabetes Mellitus Type 2

Risk Factors

Certain risk factors contribute to predisposing a patient to Diabetes Mellitus Type 2

- Risk factors for diabetes include:
 - Obesity
 - Advanced age (45 years or older)
 - Positive family history
 - Hypertension and/or dyslipidemia
 - Polycystic ovary syndrome
 - History of gestational and/or pre-diabetes

Risk Factors: The Complex Interplay of Diabetes, Systemic Inflammation and Periodontal Disease

Diabetes and Periodontal Disease

Periodontal disease is characterized by chronic bacterial infection that affects the gums and bone supporting the teeth.

- The destruction of bone and surrounding tissue is caused by infection and the body's reaction to the infection (inflammation).

Diabetes and Periodontal Disease

While primary management of periodontal disease is directed to controlling the infection, blood glucose control is also critical.

- Patients with pre-diabetes have more periodontal disease than patients without diabetes.
- This suggests that the worse the glycemic control, the greater the risk of periodontal disease.

Diabetes and Periodontal Disease

The relationship between diabetes, periodontal disease and systemic complications is three-way.

- Patients with diabetes are more susceptible to serious periodontal disease.
- Serious periodontal disease affects blood glucose control and contributes to progression of diabetes.
- Patients with periodontal disease and diabetes are more likely to have systemic complications.

Diabetes as a Risk Factor For Periodontal Disease

From Diabetes To Periodontal Disease

People who are obese eat more fast foods, sweets and carbonated drinks and less fruits, vegetables and dairy products.

- This has a negative impact on the teeth due to constant feeding of sugary foods to the oral cavity.

From Diabetes To Periodontal Disease

Patients with diabetes who use insulin are often encouraged to eat frequent, small meals throughout the day.

- Diabetic patients often think they must keep eating to prevent hypoglycemia.
- This provides a constant food source to the bacteria in the mouth.

From Diabetes To Periodontal Disease

People with diabetes have decreased saliva and are less able to clear away food particles.

- This further increases the contact time of ingested carbohydrates with the bacteria in the mouth and worsens oral disease.

From Diabetes To Periodontal Disease

People with few teeth or who have dentures prefer food that is easily digested and easily swallowed with minimal chewing.

- These foods are often high in simple carbohydrates, low in fiber, and high in fat.
- Thus, patients with mouth pain can't really eat well and are at risk for deficiencies of certain nutrients.

From Diabetes To Periodontal Disease

Poor nutrition impairs the proper development of tissue lining of the oral cavity and compromises healing.

- Poor nutrition also compromises the immune response and decreases the ability to modulate inflammatory response.
- Thus, patients with diabetes are more susceptible to oral infections and delayed wound healing.

Periodontal Disease as a Risk Factor For Diabetes

From Periodontal Disease To Diabetes

Patients with diabetes who are overweight or obese have more periodontal disease.

- Adipose tissue is composed of adipocytes, which enlarge and secrete inflammatory mediators.
- Adipose tissue-induced inflammation increases gingival inflammation.

From Periodontal Disease To Diabetes

Periodontal disease induces Inflammatory cells to migrate to the oral cavity.

- After tooth brushing or chewing, the bacteria and inflammatory mediators enter the systemic circulation, leading to chronic systemic inflammation.

From Periodontal Disease To Diabetes

The resulting chronic systemic inflammation induces a cascade of inflammatory responses throughout the body.

- This systemic inflammation is thought to result in the development of insulin resistance and diabetes, hypertension, dyslipidemia and atheroma formation and gallstones and hepatic fatty infiltration.

Diabetes and Periodontal Disease As Risk Factors For Systemic Complications

Systemic Complications

Upper body obesity results in more inflammatory mediators being released from the adipocytes.

- In addition to inflammatory mediators, adipocytes release free fatty acids, which then interact at the liver to release pro-atherogenic factors
- Responsible for atherosclerotic plaque formation.

Microvascular Complications

- High blood glucose levels cause narrowing of small blood vessels.
- Complex sugar-based substances build up in the walls of these vessels, causing them to thicken and leak.
- As they thicken, they supply less blood, especially to the heart, brain, legs, eyes, kidneys, nerves, and skin.

Microvascular Complications

- Skin and mucous membranes
 - Poor circulation to the skin can lead to ulcers and especially of the feet and legs.
 - Wounds heal slowly or not at all
 - Amputation is sometimes required
 - Bacterial and fungal infections of the skin and mucous membranes are common
 - When blood glucose levels are high, white blood cells cannot function effectively.
 - Any infection tends to be more severe.

Microvascular Complications

- Kidneys
 - Decreased blood flow may result in kidney failure that may require dialysis/transplantation.
 - Urine is screened for abnormally high levels of albumin, an early sign of renal damage.
 - Angiotensin-converting enzyme (ACE) inhibitors are used to slow the progression of kidney disease.
 - Leading cause of end-stage renal disease

Microvascular Complications

- Eyes
 - Damage to the blood vessels of the eye can cause leaking and loss of vision
 - Retinal damage (diabetic retinopathy)
 - Macular edema (fluid accumulation)
 - Proliferative eye disease (new vessel formation)
 - Most frequent cause of new cases of blindness among adults 20 to 74 years of age

Microvascular Complications

- Nerves
 - Nerve involvement manifests in several ways
 - Damage to nerves of the hands, legs, and feet results in abnormal sensation (diabetic polyneuropathy)
 - Tingling or burning pain
 - Weakness in arms and legs
 - Damage to the nerves of the skin results in repeated injuries due to changes in sensation of pain, pressure or temperature.

Microvascular Complications

- Nerves (continued)
 - Damage to nerves that control autonomic processes
- Results in swings in blood pressure, swallowing difficulties, altered digestive function and erectile dysfunction

Macrovascular Complications

- High blood glucose levels also cause narrowing of large blood vessels.
- Poor control of blood glucose also tends to cause the levels of fatty substances in the blood to rise
- Results in atherosclerosis and further decreased blood flow.

Macrovascular Complications

- Diabetes-Related Atherosclerosis
 - Atherosclerosis occurs at an earlier age and with greater frequency among people with diabetes
- Two out of three patients with diabetes die from some form of cardiovascular disease

Macrovascular Complications

- Coronary Artery Disease
 - Atherosclerotic plaque builds up and blocks medium to large arteries in the heart
- Results in:
 - Cardiomyopathy
 - Angina
 - Heart failure

Macrovascular Complications

- Cerebrovascular Disease
 - Atherosclerotic plaque builds up and blocks medium to large arteries in the brain
- Results in:
 - Stroke
 - Claudication
 - Ischemic attacks

Macrovascular Complications

- Peripheral arterial disease
 - Atherosclerotic plaque builds up and blocks medium to large arteries in the extremities
- Results in:
 - Claudication
 - Limb amputation
 - Erectile dysfunction
- More than 60% of nontraumatic lower-limb amputations are performed in people with diabetes

Treatment Goals for Diabetes

Treatment Goals

Hemoglobin A1C is a biochemical marker of average blood glucose levels over the preceeding 3 months.

- An A1C of 7.0 is equal to an average of 154 mg/dL over the last 3 months
- Each 1 percent reduction in A1C, represents a 40% reduction in the risk of long-term diabetes complications

Treatment Goals

Goals for treatment plans for diabetes mellitus include an A1C of less than 7.0%

- Further goals include:
 - Preprandial capillary plasma glucose of 70-130 mg/dL
 - Peak postprandial capillary plasma glucose of <180 mg/dL

Non-Pharmacologic Treatment of Diabetes Mellitus Type 2

Non-Pharmacologic Treatment

Therapeutic lifestyle modifications include nutritional therapy for weight loss and regular exercise.

- Exercise must be at least 150 minutes/week of moderate-intensity aerobic physical activity
- Weight loss has a beneficial effect on glycemic control as well as hypertension and hyperlipidemia.

Non-Pharmacologic Treatment

Unfortunately, benefits of therapeutic lifestyle modifications as the sole approach to diabetes treatment are short-lived.

- Many patients have great difficulty in implementing and maintaining lifestyle changes.

Non-Pharmacologic Treatment

In addition, over time, glycemic control deteriorates in the majority of cases due to the progressive loss of B-cells function

- Thus, a pharmacologic treatment regimen is necessary to maximize the potential for adherence.

Pharmacologic Treatment of Diabetes Mellitus Type 2

Pharmacologic Treatment

Due to the progressive loss of β -cell function, most pharmacologic therapies cannot maintain glycemic control over time

- Thus, the majority of patients eventually require combination therapy

Pharmacologic Treatment

Eventually, β -cell function deteriorates to such a extent that insulin replacement is required

- When used in sufficient doses, insulin is able to decrease any level of elevated A1C to almost therapeutic goal

Pharmacologic Treatment

Unfortunately, studies have shown no significant reduction in cardiovascular events in patients with tight glycemic control

- Further reinforces the importance of controlling associated risk factors for cardiovascular disease (hypertension and hyperlipidemia) in diabetic patients

The ABCDEFGHI's of Diabetic Care

LETTER	ELEMENT OF CARE
A	A1C Monitoring
B	Blood pressure
C	Cholesterol/aspirin
D	Diabetes education
E	Eye examinations

Source: Clin Diabetes. 2003;21:128-33.

The ABCDEFGHI's of Diabetic Care

LETTER	ELEMENT OF CARE
F	Foot examinations
G	Glucose monitoring
H	Health maintenance
I	Indications for specialty care (referrals)

Source: Clin Diabetes. 2003;21:128-33.

Agents That Increase Insulin Secretion

Pharmacologic Treatment

- Secretagogues
 - Sulfonylureas
 - Mechanism of action
 - Stimulate insulin release from beta cells
 - Types (2nd generation)
 - Glyburide (Micronase, DiaBeta, Glynase)
 - Glipizide (Glucotrol, Glucotrol XL)
 - Glimepiride (Amaryl)
 - Patient care considerations
 - Increased risk of hypoglycemia

Pharmacologic Treatment

- Secretagogues
 - Meglitinides
 - Mechanism of action
 - Stimulate insulin release from beta cells
 - Types
 - Repaglinide (Prandin)
 - Nateglinide (Starlix)
 - Patient care considerations
 - Less risk of hypoglycemia but use with caution in predisposed patients

Agents That Increase the Effect of Insulin

Pharmacologic Treatment

- Biguanides
 - Mechanism of action
 - Decrease the amount of glucose produced by the liver and may help improve insulin sensitivity
 - Result in weight loss and mild improvement of all aspects of the lipid profile
 - Types
 - Metformin (Glucophage, Glucophage XR)
 - Patient care considerations
 - Risk of hypoglycemia in predisposed patients

Pharmacologic Treatment

- Biguanides
 - Advantages of metformin
 - Usually does not cause either hypoglycemia or weight gain
 - Associated with a generally low level of adverse effects (mostly GI)
 - Availability of generic version leads to a generally low cost of therapy

Pharmacologic Treatment

- Biguanides
 - Disadvantages of metformin
 - Contraindicated in:
 - Renal impairment
 - Hepatic dysfunction
 - Heart failure

Pharmacologic Treatment

- Thiazolidinediones (glitazones)
 - Mechanism of action
 - Increases insulin-dependent glucose use in skeletal muscle and adipose tissue without increasing insulin secretion. Lowers triglycerides.
 - Types
 - Rosiglitazone (Avandia)
 - Pioglitazone (Actos)
 - Patient care considerations
 - Rosiglitazone potentially causes increased risk of heart-related deaths

Pharmacologic Treatment

- Alpha-glucosidase inhibitors
 - Mechanism of action
 - Delay carbohydrate absorption and help prevent postprandial glucose surges.
 - Types
 - Acarbose (Precose)
 - Miglitol (Glyset)
 - Patient care considerations
 - Use glucose, not sucrose, to treat hypoglycemia

Agents That Modify Hormone Systems

Pharmacologic Treatment

- Amylin analogs
 - Mechanism of action
 - Synthetic analogue of amylin, a naturally occurring hormone made in beta cells.
 - Slows gastric emptying, suppresses appetite and postprandial glucagon secretion,
 - Types
 - Pramlintide acetate (Symlin)
 - Patient care considerations
 - Increases risk of insulin-induced hypoglycemia

Pharmacologic Treatment

- Incretin mimetics
 - Mechanism of action
 - Enhance insulin secretion by pancreatic beta cells, suppresses inappropriately elevated glucagon secretion, and slow gastric emptying
 - Types
 - Exenatide (Byetta)
 - Liraglutide (Victoza)
 - Patient care considerations
 - Possible increased risk of pancreatitis
 - Possible risk of thyroid c-cell tumor (liraglutide)

Pharmacologic Treatment

- DPP-4 Inhibitors
 - Mechanism of Action
 - Inhibits DPP-4 enzyme, increases incretin hormones
 - Released by intestines throughout the day, increase in response to a meal
 - Regulate glucose homeostasis by increasing insulin secretion, decreasing glucagon secretion

Pharmacologic Treatment

- DPP-4 Inhibitors
 - Types
 - Sitagliptin (Januvia)
 - Saxagliptin (Onglyza)
 - Linagliptin (Tradjenta)
 - Alogliptin (Nesina)
 - Alogliptin + pioglitazone (Oseni)
 - Alogliptin + metformin (Kazano)

Pharmacologic Treatment

- Adverse Effects
 - Peripheral edema
 - Headache
 - Hypoglycemia
 - Abdominal pain, vomiting
 - Sinusitis
- Patient Care Considerations
 - Possible increased risk of pancreatitis
 - Morning appointments to minimize stress-induced hypoglycemia

Pharmacologic Treatment

- SGLT2 Inhibitors
 - Mechanism of Action
 - Inhibit the reabsorption of glucose in the kidney
 - Types
 - canagliflozin (Farxiga)
 - dapagliflozin (Invokana)
 - empagliflozin (Jardiance)
 - Patient care considerations
 - Possible xerostomia due to frequent urination

Pharmacologic Treatment

- Centrally Acting Dopamine Agonists
 - Mechanism of action
 - Modulate dopamine in metabolic disease states to reduce insulin resistance
 - Types
 - Cycloset (bromocriptine)
 - Patient care consideration
 - Orthostatic hypotension
 - Possible muscle spasticity and rigidity

Pharmacologic Treatment

- Insulin
 - Mechanism of action
 - Replacement of endogenous insulin

– Types

Short Acting	Intermediate Acting	Long Acting
<ul style="list-style-type: none"> ▪ Humulin R ▪ Insulin aspart (Novolog) ▪ Insulin lispro (Humalog) ▪ Insulin glulisine (Apidra) 	<ul style="list-style-type: none"> ▪ Humulin N ▪ Humulin L ▪ Humulin 70/30 ▪ Humalog Mix 	<ul style="list-style-type: none"> ▪ Humulin U ▪ Insulin detemir (Levemir) ▪ Insulin glargine (Lantus)

– Patient care considerations

- Treat hypoglycemia with glucagon, glucose

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Pharmacologic Treatment

Unfortunately, many patients who would benefit from insulin do not receive it in a timely manner, or do not receive it at all

- In a recent study, for half of the patients, insulin initiation was delayed for almost 5 years after oral agent therapy failed to maintain glycemic control.

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Pharmacologic Treatment

PATIENT BELIEF	FACT
<ul style="list-style-type: none"> • Insulins are not effective 	<ul style="list-style-type: none"> • Insulin analogs closely mimic endogenous insulin secretion • Insulin reduces extremely high glucose levels more effectively than any other agent

Source: J Am Pharm Assoc. 2017;49:e152-62

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Pharmacologic Treatment

PATIENT BELIEF	FACT
<ul style="list-style-type: none"> • Insulin causes hypoglycemia 	<ul style="list-style-type: none"> • Insulin analogs have a more predictable profile than human insulins and are associated with lower levels of hypoglycemia • Rapid-acting analogs can be given just before meals so the patient feels more in control of glucose levels

Source: J Am Pharm Assoc. 2017;49:e152-62

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Pharmacologic Treatment

PATIENT BELIEF	FACT
<ul style="list-style-type: none"> • Insulin causes weight gain 	<ul style="list-style-type: none"> • Insulin analogs are associated with less weight gain than human insulin • Insulin analogs cause less hypoglycemia, patients are less likely to snack • Diet and exercise can help reduce weight

Source: J Am Pharm Assoc. 2017;49:e152-62

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Pharmacologic Treatment

PATIENT BELIEF	FACT
<ul style="list-style-type: none"> • Insulin regimens are complex 	<ul style="list-style-type: none"> • Insulin analogs are usually given only once daily • Rapid-acting analogs can be given just before meals • Premixed insulin analogs combine two types of insulin in one formulation

Source: J Am Pharm Assoc. 2017;49:e152-62

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Pharmacologic Treatment

PATIENT BELIEF	FACT
<ul style="list-style-type: none"> Insulin is difficult and painful to administer 	<ul style="list-style-type: none"> Pen delivery devices are discreet, easy to use, and accurate Modern needles are fine and typically associated with less pain

Source: J Am Pharm Assoc. 2017;49:e152-62

Diabetic Dental Patient Management

Significance to Dentistry

Prolonged hyperglycemia results in impaired ability to fight infections and prolonged and altered wound healing.

- Patients with diabetes undergoing dental procedures are at greater risk for infection and have a more difficult time healing properly.

Significance to Dentistry

Patients with diabetes are at higher risk for gingivitis and periodontitis.

- People with diabetes are more susceptible to bacterial infection and have decreased ability to fight the bacteria that invade the gingival tissues.

Significance to Dentistry

Periodontal disease may cause blood sugar to rise, making diabetes harder to control and resulting in other oral health problems.

- Other oral health problems associated with diabetes:
 - Thrush
 - Xerostomia
 - Caries

Patient Assessment

Interview the patient to gain as much information as possible about their individual experience with diabetes.

- Determine the patient's treatment protocol:
 - Name, type, frequency of medication
 - Frequency of glucose monitoring
 - Frequency of HbA1c monitoring
 - Frequency of hypoglycemic episodes
 - Frequency of ketotic symptoms