



DSP Series Webinar: Diabetes and Insulin Administration

Presented by: Dr. Kathy Auberry, DNP, RN, CDDN
February 3, 2021

1



Recent DSP Series Webinars

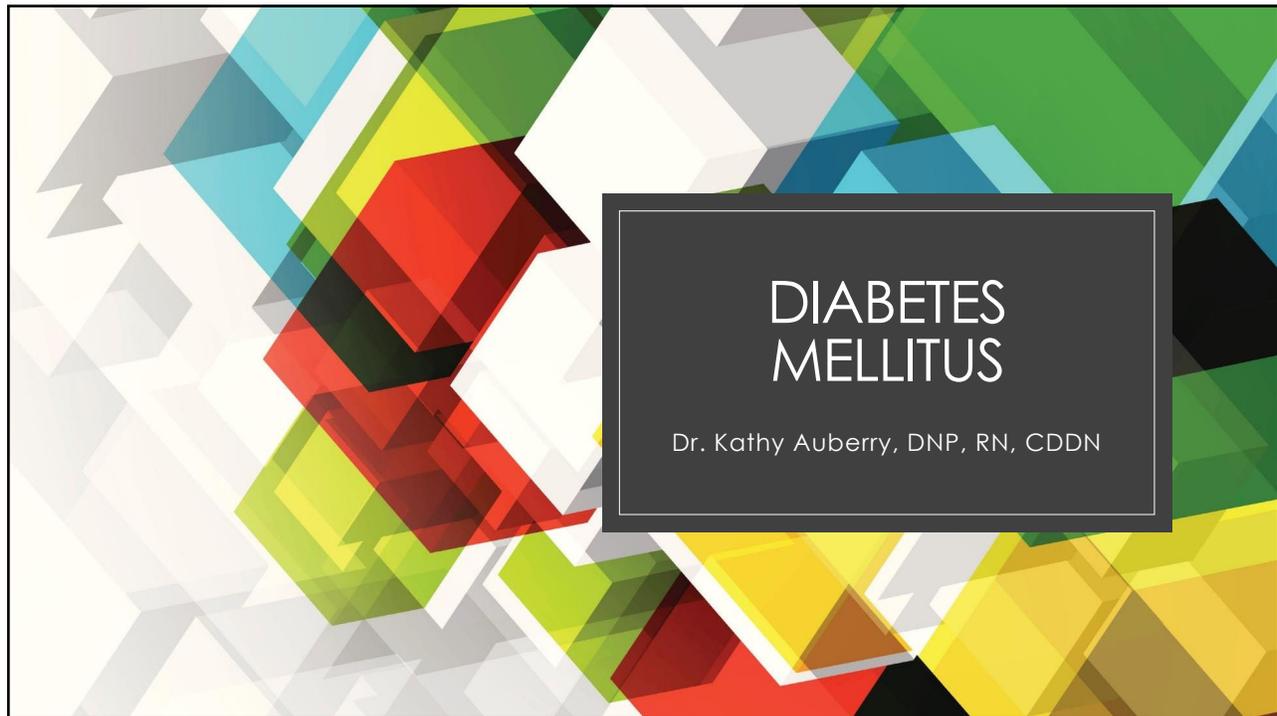
All DSP Series webinars are recorded and shared on the INARF Member Portal under the Quick Links section; including these recent webinars:

- Breaking it Down (Systematic Instruction, Simple Task Analysis)
- Safely and Fully Nourishing Individuals
- Staying Healthy and Safe in the Workplace While Navigating COVID-19

2



3



4

THANK YOU INARF

For this Opportunity

5

Presenter Background

Dr. Kathy Auberry is a registered nurse practicing in the field of intellectual and developmental disability for the past twenty-five years. She has been an Assistant Professor of Nursing at Indiana University School of Nursing at IUPUC since 2012. Dr. Auberry possesses a Doctor of Nursing Practice Degree, and a Master's Degree in Nursing- 'Healthcare Leadership with a Focus in Education', as well as certification in developmental disabilities nursing.



6

Content Overview

- Diabetes and Persons with Intellectual and/or Developmental Disability
- Defining Type One and Type Two Diabetes
- Hyperglycemia and Hypoglycemia
- Treatment Options
- Administering Insulin with an Insulin Pen
- Educating and Supporting
- Prevention Strategies
- When to Call the Nurse

7

Objectives

- Understand basic physiology of diabetes
- Define diabetes
- Identify risk factors for individuals with intellectual and/or developmental disability
- Name the normal range for blood sugar readings
- Identify the signs and symptoms of high blood sugar (hyperglycemia) and low blood sugar (hypoglycemia)

8

Objectives

- Recognize treatment options for high blood sugar (hyperglycemia) and low blood sugar (hypoglycemia)
- Describe how to accurately complete a blood sugar check
- Label the steps for administering insulin using an insulin pen
- Identify when to notify the Nurse

9

A Clarification

- Diabetes Management including blood sugar checks, oral medications, injectable insulin, and insulin pen administration should be under the continual guidance of the primary care provider and agency nurse. Guidance should include specific medication/insulin orders, schedule of blood sugar checks, training, and a treatment plan for hyperglycemic (high glucose) and hypoglycemic (low blood sugar) reactions.
- The following information is for background educational information only and is not intended to prepare DSPs to perform blood sugar checks, administer oral medications, or give insulin injections, and is not considered to be comprehensive in content.

10

Diabetes and Persons with Intellectual and/or Developmental Disability

- Aging population with age related disorders such as diabetes
- Some classes of medication may increase chance of developing diabetes
 - Antipsychotics may lead to weight increase, a precursor to diabetes
- Inadequate focus on disease prevention
- Sedentary life-style

11

Diabetes and Persons with Intellectual and/or Developmental Disability

- Physical limitations may increase chances of obesity
- Less likely to have adequate health checks
- Risks for *Type 1 Diabetes*: Klinefelter Syndrome, Prader Willi, and Down syndrome
 - Extra weight around, the girth, has been identified as contributing to insulin resistance

12

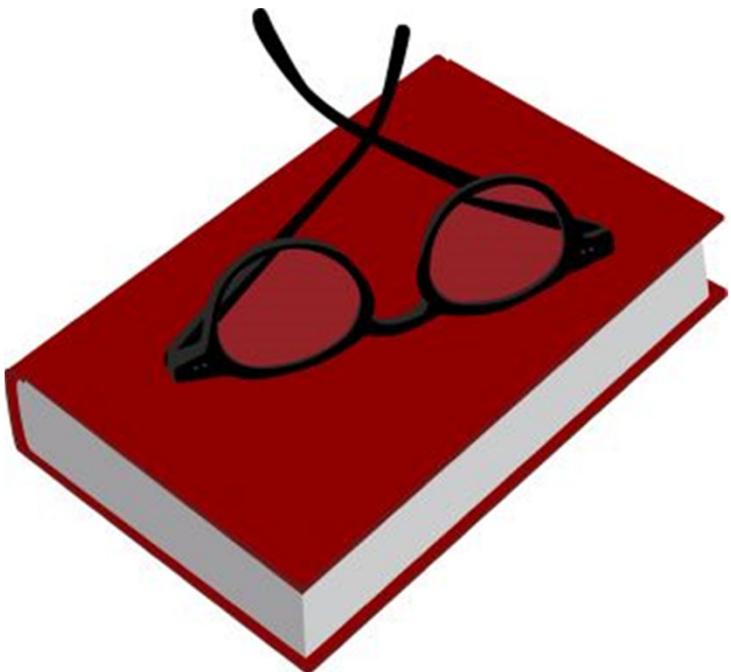


Prevalence

According to the Center for Disease Control:

About 1 in 6 people with disabilities (16.7%) in the United States in are diagnosed with diabetes, compared to 1 in 14 people without disabilities (7.4%). (2018)

13

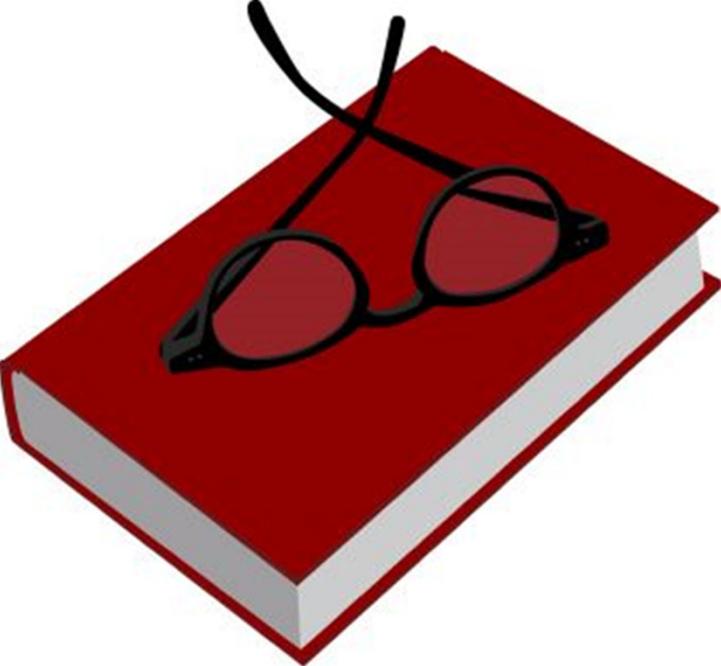


Comprehension Checkpoint!

What are 3 risk factors for individuals with intellectual/developmental disability developing diabetes?

According to research by the CDC: What is the percent of individuals with intellectual-developmental disability who develop diabetes?

14



Comprehension Checkpoint!

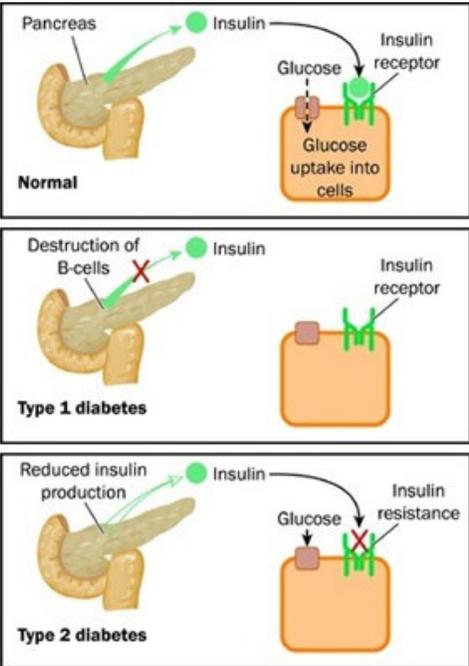
What are 3 risk factors for individuals with intellectual/developmental disability developing diabetes?

- Aging population
- Medications
- Sedentary life-style
- Limited focus on prevention

According to research by the CDC: What is the percent of individuals with intellectual-developmental disability who develop diabetes?

1 in 6 people with disabilities (16.7%)

15



Normal

The pancreas produces insulin, which binds to the insulin receptor on the cell surface. This triggers a signal that allows glucose to enter the cell, resulting in glucose uptake into cells.

Type 1 diabetes

There is a destruction of B-cells in the pancreas (indicated by a red X), leading to a significant reduction in insulin production. The insulin receptor on the cell surface is present but not receiving enough insulin to facilitate glucose uptake.

Type 2 diabetes

There is reduced insulin production from the pancreas. Additionally, the cell surface exhibits insulin resistance, where the insulin receptor is present but does not respond properly to the insulin, preventing glucose from entering the cell.

Definition

A condition in which the pancreas no longer produces enough insulin or cells stop responding to the insulin produced, so that glucose in the blood cannot be absorbed into the cells of the body

16

Types of Diabetes

Type I

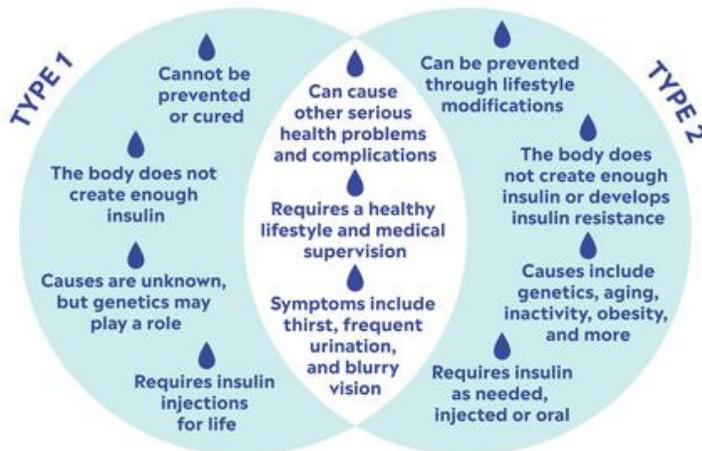
- **Type 1 diabetes**, your pancreas doesn't make insulin or makes very little insulin. Insulin is a hormone that helps blood sugar enter the cells in your body where it can be used for energy. Without insulin, blood sugar can't get into cells and builds up in the bloodstream.

Type II

- **Type 2 diabetes** is a condition in which the cells cannot use blood sugar efficiently to meet the body's needs

17

TYPE 1 vs TYPE 2 DIABETES



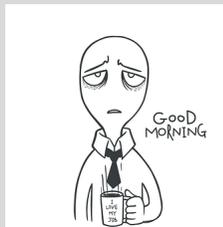
Comparing

Type One Diabetes and Type Two Diabetes

18

Signs and Symptoms of Diabetes

- Frequent urination
- Lethargy
- Excessive Thirst
- Hunger
- Cuts/bruises that are slow to heal
- Weight loss—even though you are eating more (**type 1**)
- Tingling, pain, or numbness in the hands/feet (**type 2**)



19

Hyperglycemia

- **Causes**
 - Undiagnosed diabetes
 - Infections
 - Medications
 - Emotional Stress
- **Symptoms:**
 - Increased thirst
 - Increased urination
 - Vision problems
 - Fatigue
- **Treatment**
 - Oral agents
 - Insulin

20

Hypoglycemia

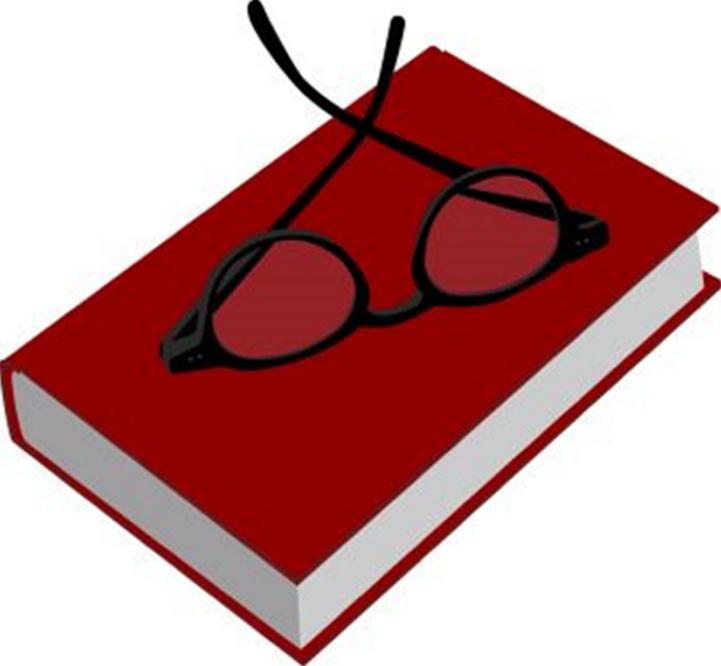
- **Causes:**
 - Overdose of insulin
 - Insufficient diet
 - Overexercise
- **Treatment:**
 - 4 oz. Orange Juice
 - Honey
 - Milk
 - Peanut Butter
 - Cheese
- **Symptoms:**
 - Fatigue
 - Pale skin
 - Shakiness
 - Anxiety
 - Sweating
 - Hunger
 - Irritability

21

Diabetic Ketoacidosis (DKA)

- **TYPE ONE diabetes** can progress to DKA if untreated.
- DKA occurs when blood glucose is dangerously high, and the body can't get nutrients into the cells because of the absence of insulin.
- The body then breaks down muscle and fat for energy, causing an accumulation of ketones in the blood and urine.
- Symptoms of DKA include a fruity odor on the breath, heavy, taxed breathing and vomiting. If left untreated, DKA can result in stupor, unconsciousness, and even death.
 - <https://www.diabetes.org/diabetes/type-1/symptoms>

22

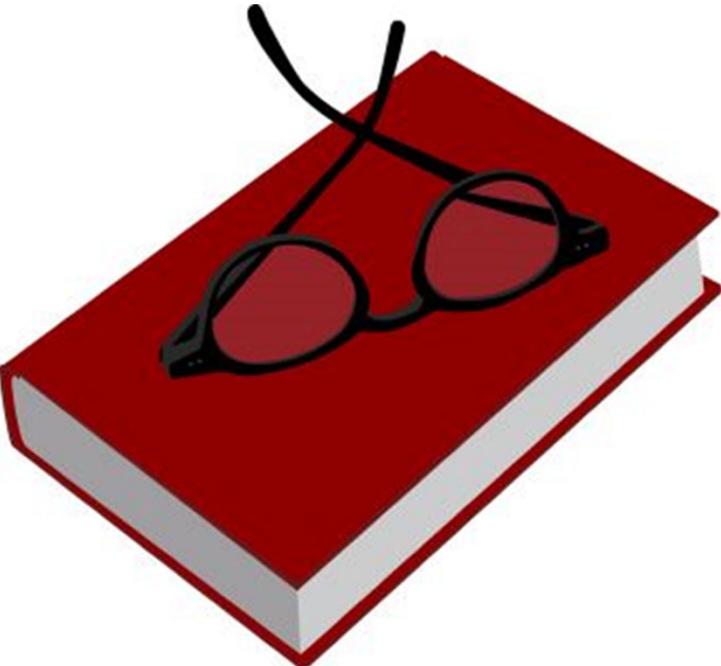


Comprehension Checkpoint!

What are symptoms of Hyperglycemia?

What are symptoms of Hypoglycemia?

23



Comprehension Checkpoint!

What are symptoms of Hyperglycemia?

- Increased thirst
- Increased urination
- Vision problems
- Fatigue

What are symptoms of Hypoglycemia?

- Fatigue
- Pale skin
- Shakiness
- Anxiety
- Sweating
- Hunger
- Irritability

24

Screening and Monitoring for Diabetes

- **Fasting Blood Sugar (FBS).** This test checks fasting blood sugar levels. Fasting means not having anything to eat or drink (except water) for at least 8 hours before the test. This test is usually done first thing in the morning, before breakfast.

Result	Fasting Plasma Glucose (FPG)
Normal	less than 100 mg/dl
Prediabetes	100 mg/dl to 125 mg/dl
Diabetes	126 mg/dl or higher

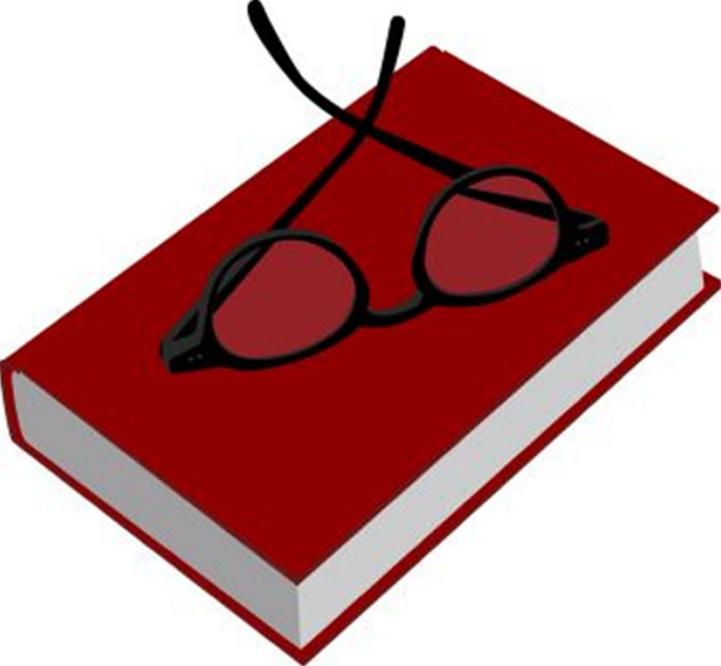
- Diabetes is diagnosed at fasting blood sugar of greater than or equal to 126 mg/dl
 - <https://www.diabetes.org/diabetes/type-1/symptoms>

25

Screening and Monitoring for Diabetes

- **A1C Blood Draw:** average blood sugar over the past two to three months.
- 1. Can Diagnose Prediabetes
- 2. Monitors Diabetes
- If A1C level is between 5.7 and less than 6.5%, levels are in the prediabetes range.
- If A1C level of 6.5% or higher, levels are in the diabetes range.

26

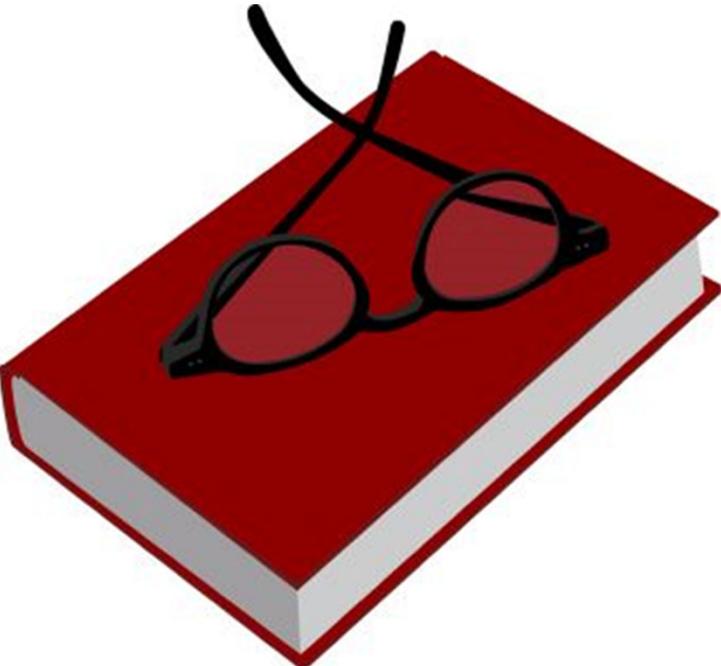


Comprehension Checkpoint!

What is the difference between the blood tests A1C and FBS?

Type answers in question box.

27



Comprehension Checkpoint!

What is the difference between the blood tests A1C and FBS?

FBS: nothing to eat or drink for eight hours. Tests current blood sugar.

A1C: Is the average blood sugar over the past 3 months

28

Taking a Blood Sugar Test

- **Receive specific training on the make and model of the glucometer, and finger stick device**
- Materials needed: Glucometer, lancets, test strips, alcohol swabs
- Wash your hands thoroughly
- Use an alcohol wipe to cleanse the finger to be tested. Be sure to let the site dry before testing.
- Place a testing strip into the meter.
- Prick the side of finger with the lancet to get a small drop of blood.
- The blood goes on the test strip you inserted into the meter.
- The monitor will analyze the blood and give you the blood glucose reading on its digital display usually within a minute.
- Finger pricks rarely require a bandage, but you may want to use one if bleeding continues beyond a few drops. It's important to follow all the instructions that came with your glucometer

29

Treatment

- Weight Loss Healthy Diet
- Exercise
- Positive Emotional Support
- Oral Medications
- Insulin

30

Oral Medications

- | <u>DRUG CLASS</u> | <u>AGENTS</u> |
|--|---------------|
| ◦ Sulfonylureas | |
| ◦ <i>First generation:</i> Acetohexamide (Dymelor), Chlorpropamide (Diabinese), Tolazamide (Tolinase), Tolbutamide (Orinase) | |
| ◦ <i>Second generation:</i> Glyburide (Micronase), Glipizide (Glucotrol), Glimepiride (Amaryl), | |
| ◦ Meglitinides: Repaglinide (Prandin), Nateglinide (Starlix) | |
| ◦ Biguanides: Metformin (Glucophage) | |
| ◦ Thiazolidinediones: Pioglitazone (Actos), Rosiglitazone (Avandia) | |
| ◦ Alpha-glucosidase inhibitors: Acarbose (Precose), Miglitol (Glycet) | |

31

Common Side Effects of Oral Medications

- **Sulfonylureas:** low blood sugar, upset stomach, skin rash or itching, weight gain

- **Biguanides/Metformin:** sickness with alcohol, kidney complications, upset stomach, tiredness or dizziness, metal taste

- **Alpha-glucosidase inhibitors:** gas, bloating and diarrhea

32

Insulin and Diabetes

- Various insulin types
 - Action: Long and short
- Accurate Measurement
- Sliding Scale orders
- Syringe/ Pen options
 - <http://bcd.com/us/diabetes/page.aspx?cat=7001&d=7259>
- Storage
- What is your agency policy?
 - Is there a Protocol?



38

Insulin Pen

Use correct needle size

Use needle one time and dispose

33

Administering Insulin with a Pen



- <https://www.youtube.com/watch?v=8g4rEhOukmM>

34

Insulin

- Used to treat Type I Diabetes (Also now sometimes Type II)
- Types
 - Humulin,
 - × Intermediate acting
 - Lantus,
 - × Long acting
 - Humalog
 - × Rapid acting
 - Novalog
 - × Rapid acting
- Side Effects

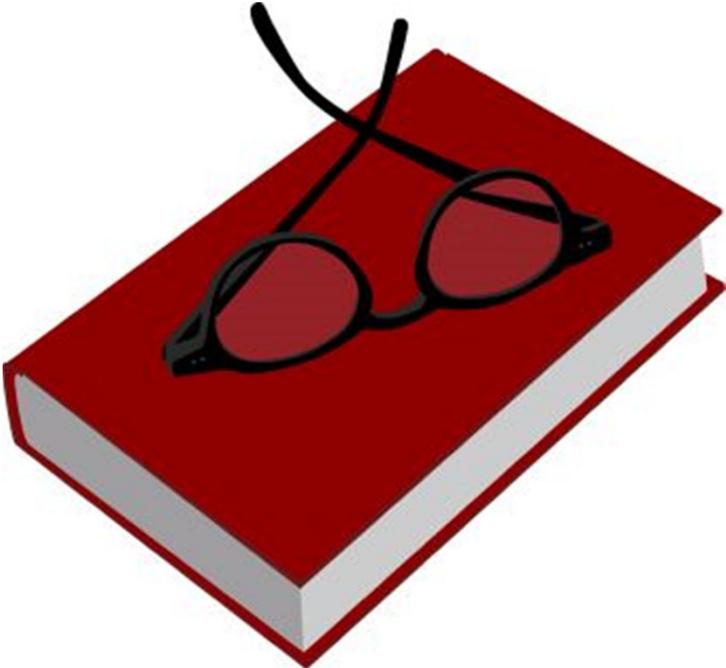


Insulin Types

Caution-Requires:

- Comprehensive training by a medical professional with Hands on and return demonstration by DSP
- Healthcare provider's order
- Healthcare Diabetes Plan
- Approval by the policy of the agency
- Insulin syringe
- Accurate administration
- 2- person check before administering

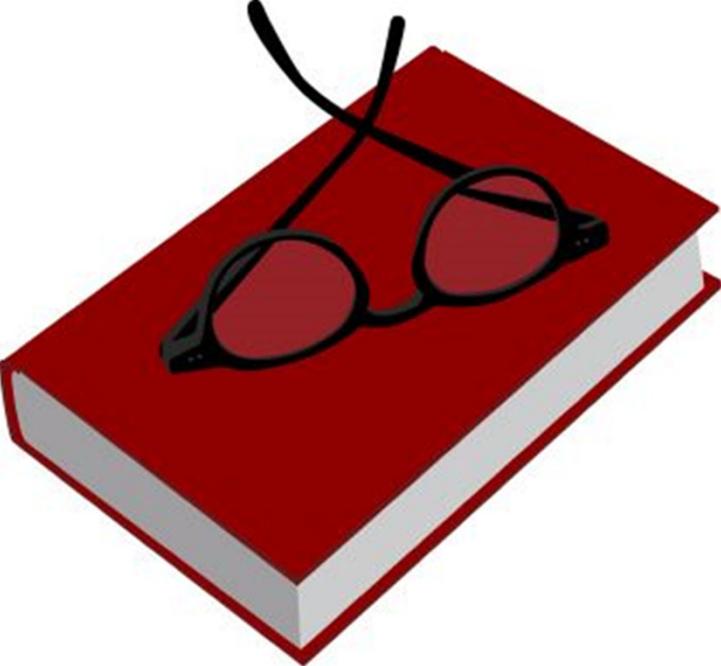
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Comprehension Checkpoint!

True or False:
There is only 1 type of Insulin to treat diabetes mellitus.

36



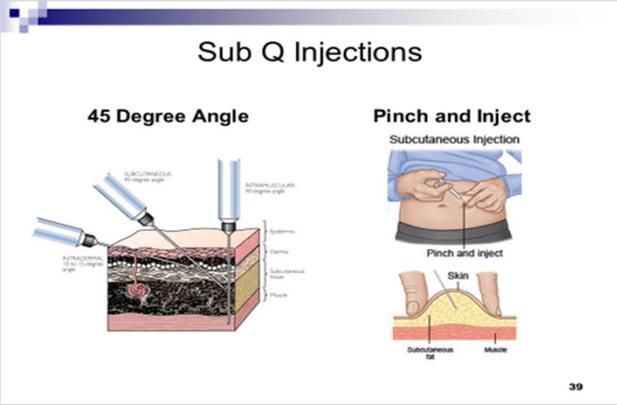
Comprehension Checkpoint!

True or False:
There is only 1 type of Insulin to treat diabetes mellitus.

False-there are many types of insulin

37

Injection Type: Subcutaneous



Sub Q Injections

45 Degree Angle

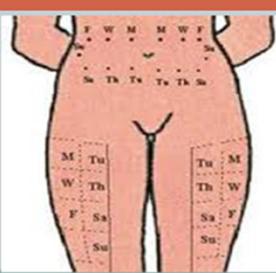
Pinch and Inject
Subcutaneous Injection

39

38

Injection Sites

Injecting Insulin

Injections	Injection Sites
<ul style="list-style-type: none"> • Subcutaneous injection • <u>Have second person check accuracy</u> • Rotate sites • Premixed dose caution <ul style="list-style-type: none"> ○ Ex: Humulin 70/30 • Sliding Scale administration <ul style="list-style-type: none"> ○ Standing orders that are determined by blood sugar readings 	

39

Sample of a Sliding Scale

Sliding Scale for Insulin

Finger Stick Blood Glucose	Mild Scale	Moderate Scale	Aggressive Scale
<60	1 amp (25 g) D50 or orange juice, call MD	1 amp D50 or orange juice, call MD	1 amp D50 or orange juice, call MD
60-150	No insulin	No insulin	No insulin
151-200	No insulin	3 units	4 units
201-250	2 units	5 units	6 units
251-300	4 units	7 units	10 units
301-350	6 units	9 units	12 units
351-400	8 units	11 units	15 units
>400	10 units, call physician	13 units, call physician	18 units, call physician

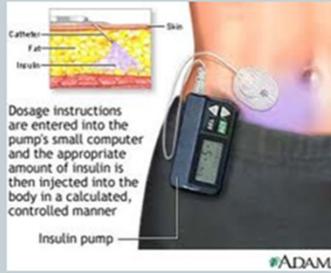
41

40

Insulin Pump

Other Diabetic Treatments

- Insulin Pump



Dosage instructions are entered into the pump's small computer and the appropriate amount of insulin is then injected into the body in a calculated, controlled manner

Insulin pump

#ADAM

41

Remember:

- **High Blood Sugar/Hyperglycemia:**
 - Follow the plan by the healthcare provider/support team
- **Low Blood Sugar/Hypoglycemia:**
 - Follow the plan by the healthcare provider/support team

42

Educating and Supporting

- **DSPs** can help educate persons with developmental disability to reduce the risks associated with diabetes:
 - Educate using information about diabetes in a format appropriate to their level of understanding
 - Educate on the risk factors for type 2 diabetes
 - Assist them to modify their lifestyle and behaviors
 - Create with the team and individual, a diabetes/health action plan
 - Assist them to set realistic goals
 - Have a strong focus on celebration and positive support

43

Preventing Diabetes

- Reduce obesity
- Diet Control
 - Reduce sugar intake. - Reduce fats and saturated food intakes.
 - Eat smaller portions of starchy carbohydrate foods, such as potatoes, rice and bread
- Promote Activity

44

Individualized Diabetes Plan

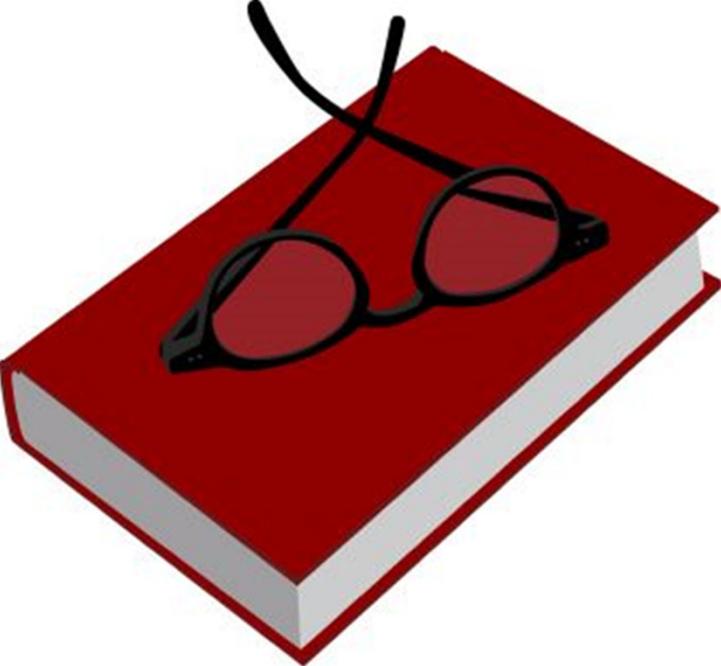
- Developed by the Support Team
- Include a 'Sick Day' plan
- May include a sliding scale
- Monitor skin and feet
- Include tracking sheet for monitoring Blood Sugar Levels
- Include ordered lab tests and the rationale for testing
- Ensure all DSPs are trained on the Diabetes Plan
- Include 'when to call the nurse' in the Diabetes Plan

45

When to Call the Nurse/Seek Assistance

- As A DSP Make sure to seek assistance when:
 - You have not been trained on the individual's diabetes plan
 - You have not received training on how to administer the individual's insulin pen
 - You have questions about the insulin or medication the individual has ordered
 - Signs and symptoms of hyperglycemia or hypoglycemia are present
 - As stated in the individuals support plan
 - ANY time you have concerns about the health and safety of the individual.

46

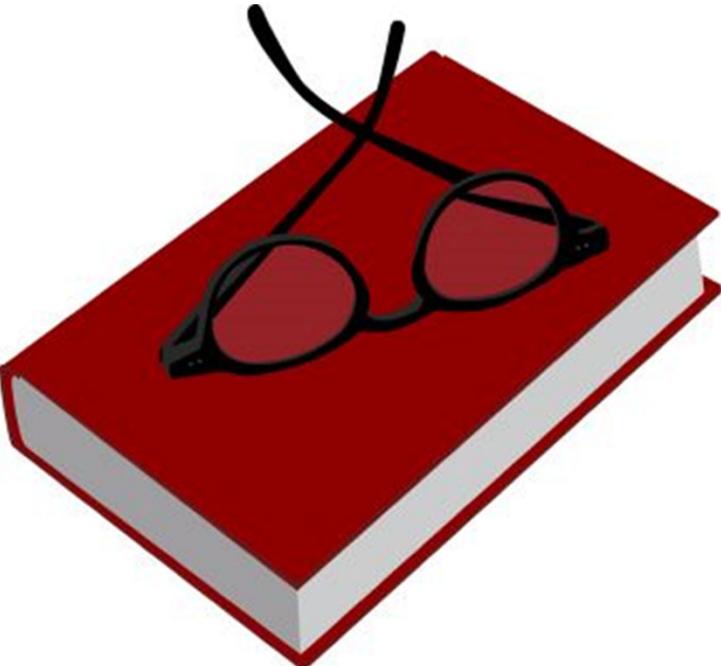


Comprehension
Checkpoint!

When should a
DSP call the
Nurse?

*Type answers in
question box.*

47



Comprehension
Checkpoint!

**When should a DSP call the
Nurse?**

- You have not been trained on
the individual's diabetes plan
- You have not received training
on how to administer the
individual's insulin pen
- You have questions about the
insulin or medication the
individual has ordered
- Signs and symptoms of
hyperglycemia or
hypoglycemia are present
- As stated in the individuals
support plan
- ANY time you have concerns
about the health and safety of
the individual

48



Questions?

Thank you!

49

References and Resources

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50

References and Resources

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- Yang, Eunjin; Kim, Hee Jung; Ryu, Hyunju; Chang, Sun Ju. (2020) Diabetes self-care behaviors in adults with disabilities: A systematic review. *Japan Nursing Journal of Science*. Blackwell Publishing. DOI:[10.1111/jjns.12289](https://doi.org/10.1111/jjns.12289)
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51



Thank you!

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52