- Measures have been taken, by the Utah Department of Health, Bureau of Health Promotions, to ensure no conflict of interest in this activity.
- CNE/CEU's are available for this live webinar. You must take the pre and post tests. 80% is required on the post test to receive CNE/CEU's.
- Certificates will be emailed out to you within two weeks

Diabetes 101

From the Person with Diabetes Perspective.

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Learning Objectives:

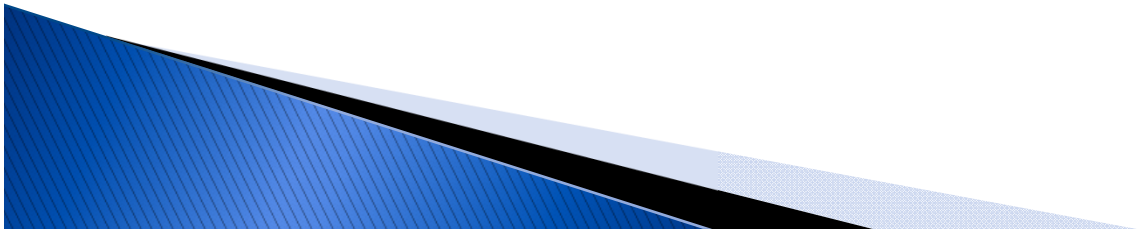
At the conclusion of the program, participants will:

1. Incorporate basic information about the AADE7 self-care behaviors into their interactions with Persons with Diabetes.

2. Be able to prioritize which information is most important for a person with diabetes to receive.

3. Discuss 3 basic messages (each) about healthy eating, physical activity, medications, and monitoring that are most important for the Person with Diabetes to understand.

4. Have their questions about basic Diabetes information answered in a way they can understand and share with others.



Myth or Fact?

Diabetes causes blindness, kidney failure, heart attack, impotence, stroke and amputations?

True **False**

Diabetes causes devastating complications?

Technically, MYTH!

- High blood sugar can cause those complications.

Well-Controlled diabetes
is the leading cause of *NOTHING*!

- But that ***good control certainly requires a lot of something(s)***— Good Management AND
Diligent Self-Management!

Essential Diabetes Self-Management Behaviors i.e. tools for "*juggling*" and *experimenting*!!!

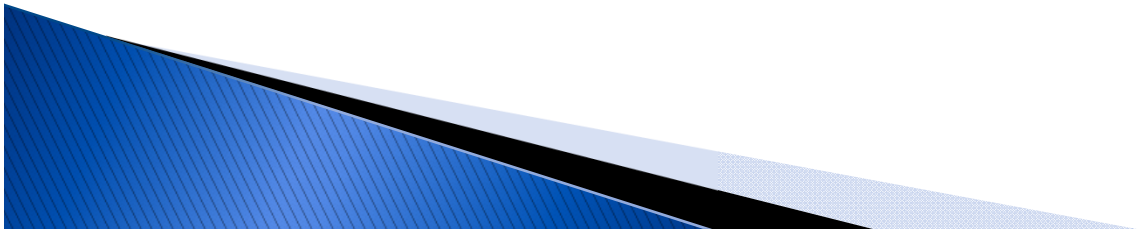
- **Healthy eating**
- **Physical Activity**
- **Taking Medications**
- **Healthy Coping**
- **Monitoring**
- **Problem Solving**
- **Reducing Risk**

The Basics of Diabetes as they relate to the 7 Self-Care Behaviors

Excellent basis for:

- Assessing personal knowledge
- Organizing education
- Evaluating care
- Evaluating self-management

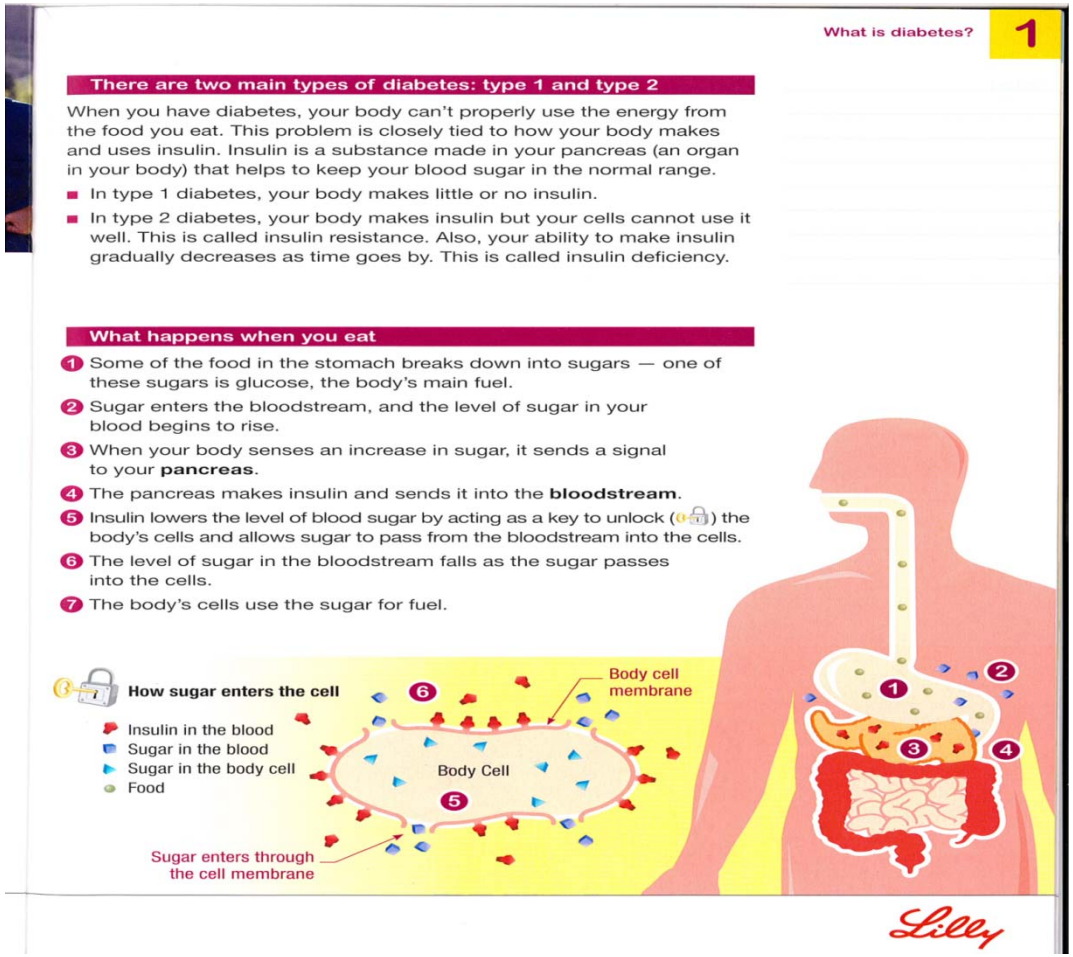
However, need to also address pathophysiology.
This gives PWD basis on which to understand and evaluate needed treatment and behavior change.



For each topic/behavior:

- Please assess your basic knowledge
- Identify 3 basic messages that might be important for an individual person with diabetes
- Prepare to prioritize your care and education around each topic.

Normal blood sugar control



What is diabetes? 1

There are two main types of diabetes: type 1 and type 2

When you have diabetes, your body can't properly use the energy from the food you eat. This problem is closely tied to how your body makes and uses insulin. Insulin is a substance made in your pancreas (an organ in your body) that helps to keep your blood sugar in the normal range.

- In type 1 diabetes, your body makes little or no insulin.
- In type 2 diabetes, your body makes insulin but your cells cannot use it well. This is called insulin resistance. Also, your ability to make insulin gradually decreases as time goes by. This is called insulin deficiency.

What happens when you eat

1. Some of the food in the stomach breaks down into sugars — one of these sugars is glucose, the body's main fuel.
2. Sugar enters the bloodstream, and the level of sugar in your blood begins to rise.
3. When your body senses an increase in sugar, it sends a signal to your **pancreas**.
4. The pancreas makes insulin and sends it into the **bloodstream**.
5. Insulin lowers the level of blood sugar by acting as a key to unlock ( ) the body's cells and allows sugar to pass from the bloodstream into the cells.
6. The level of sugar in the bloodstream falls as the sugar passes into the cells.
7. The body's cells use the sugar for fuel.

Lilly

Criteria for the Diagnosis of Diabetes

A1C ≥6.5%

OR

Fasting plasma glucose (FPG) ≥126 mg/dL (7.0 mmol/L)

OR

2-h plasma glucose ≥200 mg/dL (11.1 mmol/L) during an OGTT

OR

A random plasma glucose ≥200 mg/dL (11.1 mmol/L)

American Diabetes Association.

ADA. 2. Classification and Diagnosis. Diabetes Care 2015;38(suppl 1):S9; Table 2.1

Diabetes:

a condition characterized by

high blood sugars

- **Type 1 diabetes**: Pancreas no longer makes insulin, therefore sugar stays in the blood and cannot enter the cells (to provide energy).

Type 1 Diabetes

Little or no insulin is made. When there is not enough insulin in the blood, the sugar cannot enter the cell. Blood sugar rises. The body has no fuel for energy.

Diabetes:

a condition characterized by *high blood sugars*

- **Type 2 diabetes**: either the pancreas does not make *enough* insulin or insulin does not work correctly (insulin resistance), similar to a rusty key that does not open doors well. Often both factors are present. Additional factors may include hepatic overproduction of glucose, defect in GLP-1 "system," and kidneys holding on to glucose.

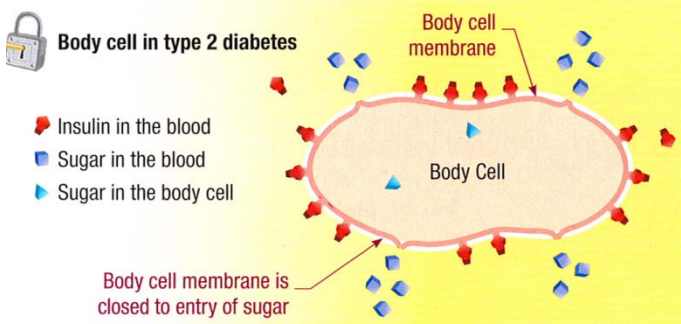
Type 2 Diabetes

Type 2 diabetes

In type 2 diabetes, your body may still make insulin, but is unable to correctly use the insulin it does make (insulin resistance). Eventually the body doesn't make enough insulin (insulin deficiency). Type 2 used to be called "non-insulin dependent diabetes." People who have it can be treated with proper meal planning, exercise, and medications. Type 2 diabetes is the most common form of diabetes and accounts for at least nine out of ten cases. Although it can occur in younger people, it most often begins when people are over 40 years of age.

The most important thing to remember is that getting diabetes is not your fault.

- The tendency to develop type 2 diabetes is inherited (present at birth).
- It does not always come from being too heavy.
- It is not caused by eating too much sugar.



The body makes some insulin but isn't able to correctly use it. If there is a problem with the cell's sugar entrances, little or no sugar can get in. Sugar builds up in the blood. Blood sugar rises.

Possible points to teach:

- ESSENTIAL to teach the progressive nature of diabetes and that all types will change over time.
- Usually helpful to explain relationship of activity and weight change to glucose levels, insulin sensitivity.
- Usually helpful to explain that the liver can cause a spike in glucose, either in response to stress or illness or in some pattern such as dawn phenomenon.
- If changing medications is or becomes an issue or if the PWD is interested in details, might be helpful to mention defect in GLP-1 "system," and kidneys holding on to glucose.

Pre-diabetes:

Blood sugar levels higher than normal but not yet high enough to be diagnosed as diabetes.

- *Before people develop type 2 diabetes, they almost always have pre-diabetes.*
- <u>Explaining this</u> may help PWD understand the progressive nature of diabetes AND help them educate family members at risk.
- <u>Research:</u> people at risk for diabetes can delay, in some cases even prevent it, with exercise and weight control which make insulin work better and make the body need less insulin.
- <u>Research</u>: some long-term damage to the body can/may occur during pre-diabetes.

Categories of Increased Risk for Diabetes (Prediabetes)*

FPG 100–125 mg/dL (5.6–6.9 mmol/L): IFG

OR

2-h plasma glucose in the 75-g OGTT 140–199 mg/dL (7.8–11.0 mmol/L): IGT

OR

A1C 5.7–6.4%

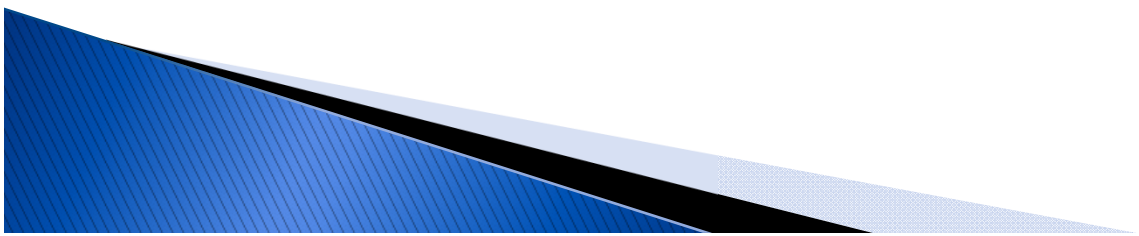
*For all three tests, risk is continuous, extending below the lower limit of a range and becoming disproportionately greater at higher ends of the range.

American Diabetes Association.

ADA. 2. Classification and Diagnosis. Diabetes Care 2015;38(suppl 1):S10; Table 2.3

PCOS and Gestational Diabetes

- Early evidence of insulin resistance
- Increased risk of Type 2 diabetes, up to 60% risk of development with Gestational Diabetes.



Healthy Eating

Messages often get mixed up!!!

- Watch carbs (for blood sugar),

  May be told to eat all the whole grains desired, no refined! NO!

- Watch calories (for weight)

- Other as needed (sodium, gluten, fat, etc.).

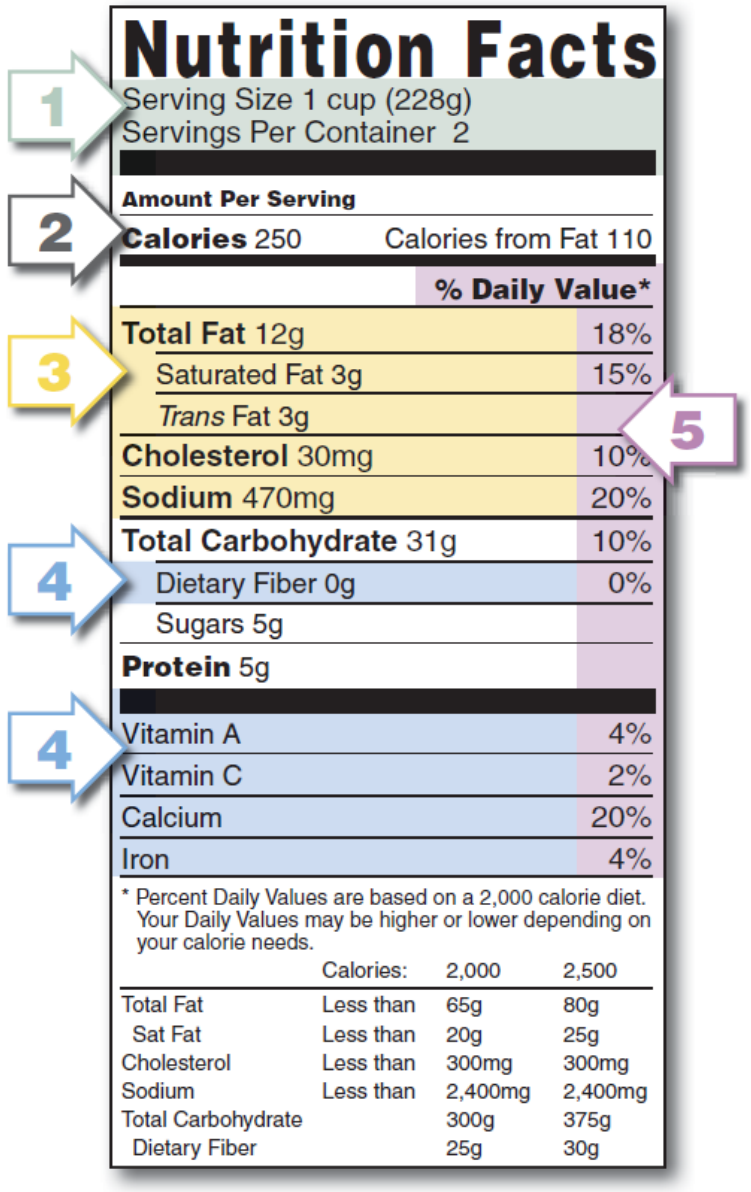
Possible Points to teach:

Carb Control:

(Mainly to predict/control glucose)

- **Increased non-starch veg**
- Distribution
- **Portion control**
- **Balance with exercise, meds**

(Implied increased fats and proteins)


Nutrition Facts
1
Serving Size 1 cup (228g)
Servings Per Container 2
2
Amount Per Serving
Calories 250
Calories from Fat 110
% Daily Value*
3
Total Fat 12g 18%
Saturated Fat 3g 15%
Trans Fat 3g
5
Cholesterol 30mg 10%
Sodium 470mg 20%
Total Carbohydrate 31g 10%
4
Dietary Fiber 0g 0%
Sugars 5g
Protein 5g
4
Vitamin A 4%
Vitamin C 2%
Calcium 20%
Iron 4%
* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.
Calories: 2,000 2,500
Total Fat Less than 65g 80g
Sat Fat Less than 20g 25g
Cholesterol Less than 300mg 300mg
Sodium Less than 2,400mg 2,400mg
Total Carbohydrate 300g 375g
Dietary Fiber 25g 30g

Possible Points to teach:

Calorie control:

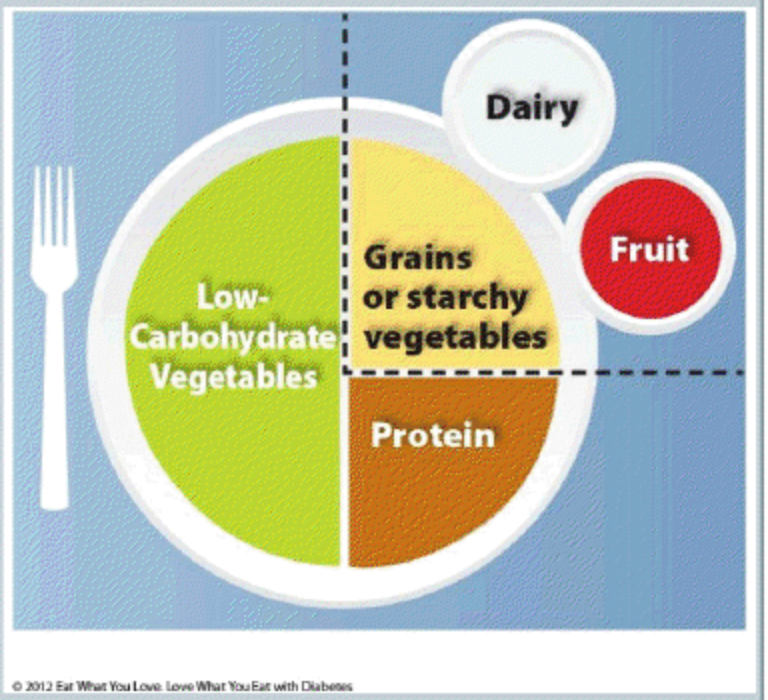
(Mainly to reduce weight for long-term reduction in glucose)

- **Reduced fat**
- **Increased non-starchy veg**
- **Portion control**
- **Balance with exercise**

Determine What to Eat

- All foods fit.
  - "Nothing is good or bad, but thinking makes it so." W. Shakespeare
- Goal of eating is nourishment and enjoyment.
  - "What do I want?
    What do I need?
    What do I have?"
- Focus on balance, variety, and moderation.
  - Eat as healthfully as possible without feeling deprived.
  - Structure and mindful eating can work together.
- Practice non-judgement
  - Learn how to include "scary foods"

Knowing your Medications



What is the Plate Method?

- Varies
- Emphasizes proportions of different groups
- Visual, relatively easy to remember
- Emphasizes fruits and vegetables
- Diabetes versions: Separate fruit and veg, Sometimes “Sides” of dairy and fruit (varies).

Important Nutrition Concepts for PWD:

Calorie control:

- Reduced fat
- **Increased non-starchy veg**
- **Portion control**
- **Balance with exercise**

"Good nutrition" (especially for CV health**):**

- Reduced fat including trans and sat fat, use of mono
- Appropriate nutrients
- **Increased fruits and vegetables**
- **Variety**

Carb Control :

- **Increased non-starch veg**
- Distribution
- Balance with exercise, meds
- **Portion control**
  - **Balance with exercise, meds**

(Increased fats and proteins may be implied)

Physical Activity

Possible Points to Teach:

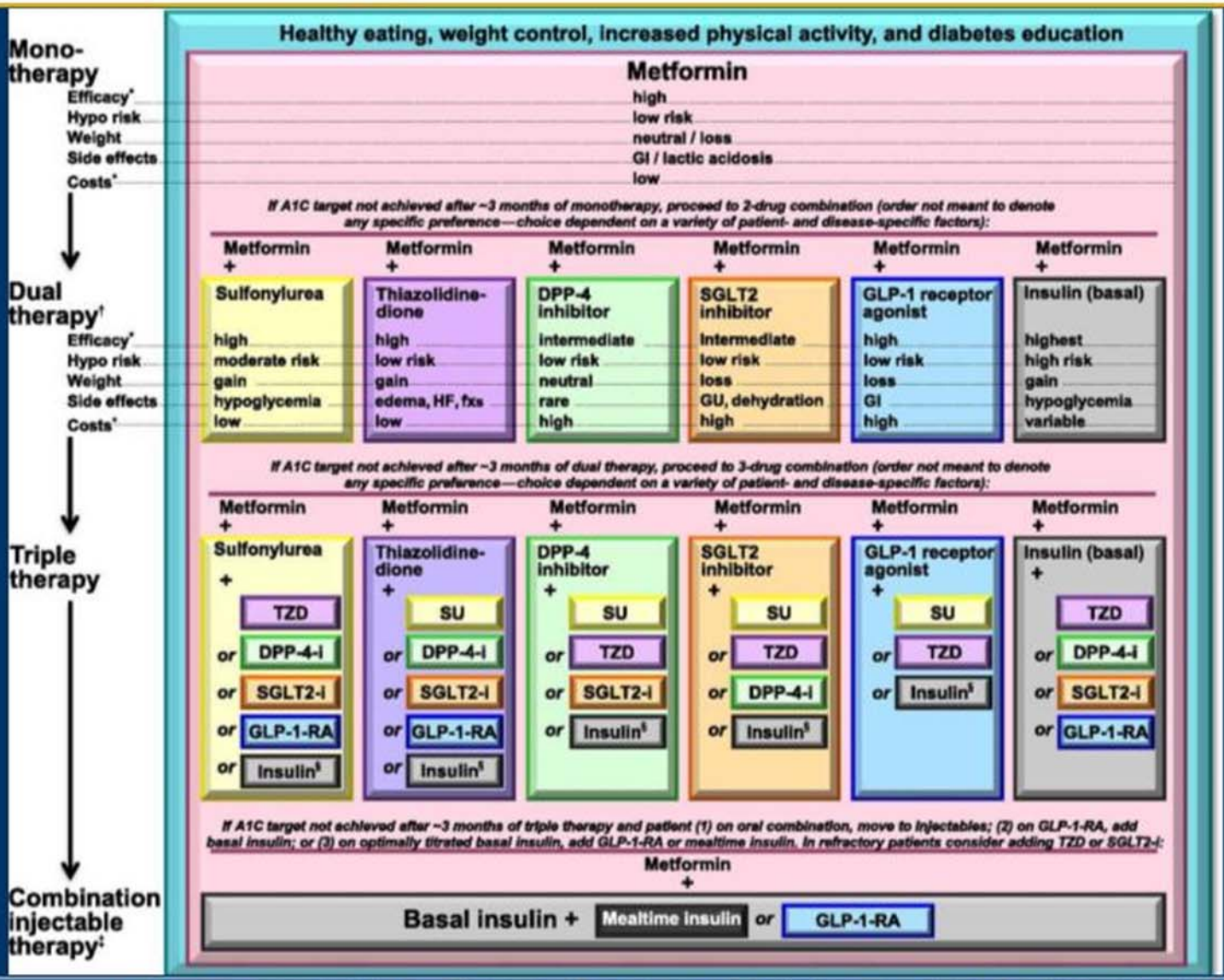
- ***Precautions for hypoglycemia, per medications and individual glucose patterns***
- ***When glucose may rise from activity***
- ***Becoming physically active is a process, not an event—behavior change principles***
- ***Activity can replace, augment medications***
- ***Activity is not required for glucose control but slows down progression of diabetes and improves overall health***
- ***Wide variety of possible activities***

Taking Medications

Possible Points to Teach:

- (Essential) Amount and Timing of meds especially in regard to food. (Can they fast?)
- (Essential) Possible side effects, what to watch for&do.
- (Essential) Cost and help with it.
- (Usually helpful) What effect on blood sugars to expect and when.
- (Per individual need.) How changing activity and intake might affect action of or need for the med.
- (For those desiring details or for some considering need for additional medications) Basic mechanisms
- (For some of those you suspect might soon need additional medication) Other meds/classes of meds that might be tried next and why.

Antihyperglycemic Therapy in Type 2 Diabetes



American Diabetes Association.

ADA. 7. Approaches to Glycemic Treatment. Diabetes Care 2015;38(suppl 1):S43. Figure 7.1; adapted with permission from Inzucchi SE, et al. Diabetes Care, 2015;38:140-149

Monitoring:

Targets for Glycemic (blood sugar) Control In Most Non-Pregnant Adults

	ADA	AACE
A1c (%)	<7*	≤6.5
Fasting (preprandial) plasma glucose	70-130 mg/dL	<110 mg/dL
Postprandial (after meal) plasma glucose	<180 mg/dL	<140 mg/dL

*<6 for certain individuals

Monitoring

Possible Points to Teach:

- ***(Essential)*** **(2 sets) Blood Glucose targets**
- ***(Essential)*** **Appropriate methodology including addressing pain, alternate sites**
- **(Essential) Glucose levels don't have to meet targets all the time! LEARN FROM THEM!**
- ***(Essential)*** **Cost of testing, help with it.**

Monitoring

Possible Points to Teach (cont):

- ***(Often Helpful)*** **Correlation between glucose tests and A1c**
- ***(Usually helpful)*** **Meaning/use of testing at different times ("When should I test")**
- ***(Essential but Individualize) What to do with results (see*** **Problem Solving*)***

A1C ~ "Average Glucose"

A1C	eAG	
%	mg/dL	mmol/L
6	126	7.0
6.5	140	7.8
7	154	8.6
7.5	169	9.4
8	183	10.1
8.5	197	10.9
9	212	11.8
9.5	226	12.6
10	240	13.4

Formula: 28.7 x A1C - 46.7 - eAG

Mean Glucose Levels for Specified A1C Levels

	Mean Plasma Glucose*			Mean Fasting Glucose	Mean Premeal Glucose	Mean Postmeal Glucose	Mean Bedtime Glucose
A1C%	mg/dL	mmol/L		mg/dL	mg/dL	mg/dL	mg/dL
6	126	7.0					
<6.5				122	118	144	136
6.5-6.99				142	139	164	153
7	154	8.6					
7.0-7.49				152	152	176	177
7.5-7.99				167	155	189	175
8	183	10.2					
8-8.5				178	179	206	222
9	212	11.8					
10	240	13.4					
11	269	14.9					
12	298	16.5					

These estimates are based on ADAG data of ~2,700 glucose measurements over 3 months per A1C measurement in 507 adults with type 1, type 2, and no diabetes. The correlation between A1C and average glucose was 0.92. A calculator for converting A1C results into estimated average glucose (eAG), in either mg/dL or mmol/L, is available at http://professional.diabetes.org/eAG.

American Diabetes Association.

ADA. 6. Glycemic Targets. Diabetes Care. 2015;38(suppl 1):S35; Table 6.1

Recommendations: Pediatric Glycemic Control (Type 1 Diabetes)

Plasma blood glucose goal range		A1C	Rationale
Before meals	Bedtime/ overnight		
90–130 mg/dL (5.0–7.2 mmol/L)	90–150 mg/dL (5.0–8.3 mmol/L)	<7.5%	A lower goal (<7.0%) is reasonable if it can be achieved without excessive hypoglycemia

- Goals should be *individualized*, and lower goals may be reasonable based on benefit-risk assessment.
- Blood glucose goals should be modified in children with frequent hypoglycemia or hypoglycemia unawareness.
- Postprandial blood glucose values should be measured when there is a discrepancy between preprandial blood glucose values and A1C levels and to help assess glycemia in those on basal–bolus regimens.

American Diabetes Association.

ADA. 11. Children and Adolescents. Diabetes Care 2015;38(suppl 1):S71; Table 11.1

Problem Solving

Points to Teach:

- Addressing **Problem Solving** and **Healthy Coping** often require discussing behavior change, use of approaches such as Motivational Interviewing.
- **Problem Solving** includes addressing challenges associated with implementing the 7 Behaviors
- A focus of **Problem Solving** **must be use of blood glucose testing**. Most PWD can to some degree learn about managing factors that affect blood glucose levels.

Problem Solving

Learning to "push" the right button, in the right direction!

Carbohydrates

Activity

Stress/Illness/pain

Medication

Problem Solving

Points to Teach MUST include:

- ***Preventing and dealing with hypoglycemia***
- ***Preventing and responding to early signs and risk factors DKA and Hyperosmolar non-ketotic diabetic comma***

The specifics taught will depend on the individual's risk for these complications.

Healthy Coping

Possible Points to Teach:

(Note need to assess and individualize)

- ***Depression*** now listed as complication of diabetes, need to watch for and discuss with HCP
- ***Negative and Positive emotions:*** Don't expect to get rid of negative. Compare to luggage in trunk, try to rearrange: downsize and/or put in back the negative(anger, denial, fear) and increase positive (hope, courage, confidence)
- ***Developing the needed support system***
- ***Principles of Behavior Change***

Reducing Risks

Recommended Testing:

Every Visit: Weight
Blood Pressure
Foot check

Every 3-6months: A1C

Every Year: Lipid panel
Comprehensive foot exam
Microalbumin
Dilated eye exam

Reducing Risks

Watch your A,B,Cs Campaign:

A1C,

Blood Pressure

Cholesterol

(also) ***possible*** **Aspirin, Blood Pressure Med, Cholesterol Med**

DANGERS OF TOBACCO USE, DRUG ABUSE

New website on drug abuse and diabetes:

http://drugabuse.com/guides/substance-abuse-and-diabetes/

Well-Controlled diabetes is the leading cause of *NOTHING*!

Addressing the AADE 7 Self-Care Behaviors is the leading cause of Well-Controlled Diabetes!