



Addressing Non Pharmacologic Management in Persons Living with Type 2 Diabetes and HIV: It's Easier than Picking the Perfect Bracket

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Objectives

- Interpret laboratory goals for individuals with type 2 diabetes and HIV
- Identify non pharmacologic treatment options used in the treatment of diabetes
- Design a culturally sensitive and culturally competent non pharmacologic treatment plan in individuals with type 2 diabetes and HIV

Abbreviations

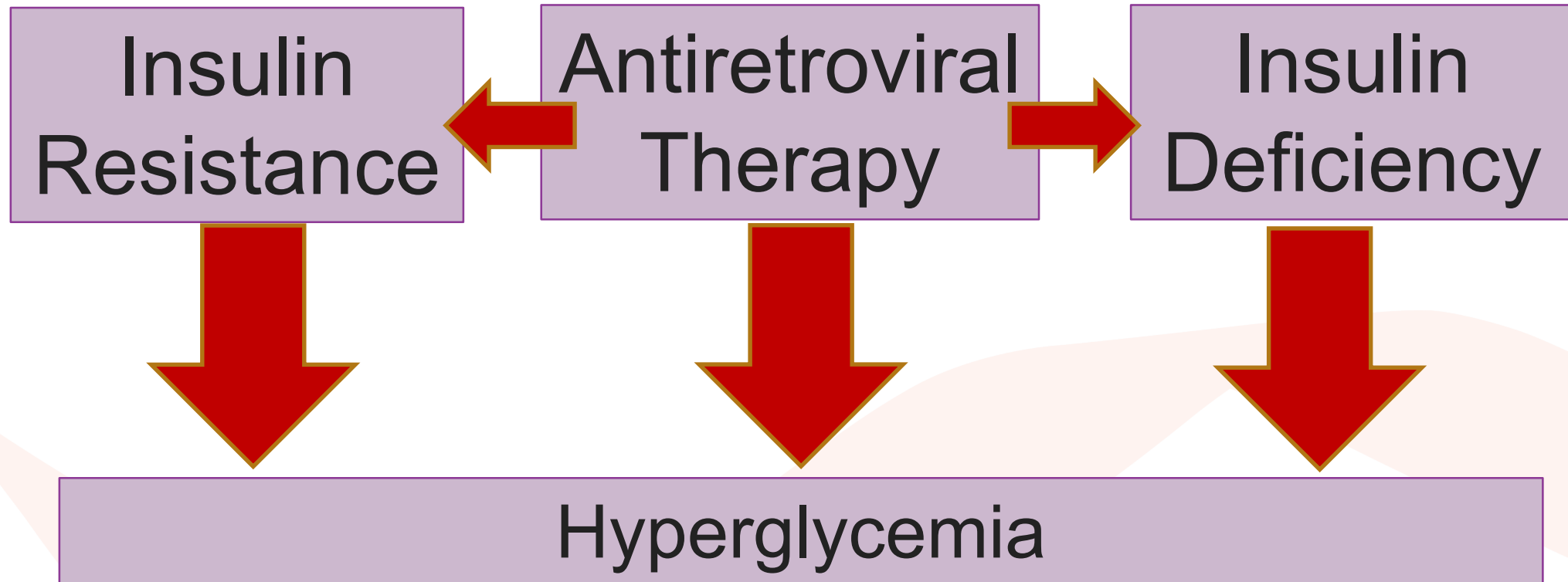
- Type 2 diabetes (T2DM)
- Hemoglobin A1c (HbA1c)
- Antiretroviral therapy (ART)
- Blood glucose (BG)
- Fasting plasma glucose (FPG)
- Fasting blood glucose (FBG)
- Postprandial blood glucose (PPG)
- Self monitoring blood glucose (SMBG)

Statistics

- 30.3 million individuals have diabetes (9.4% of the population)
- 84.1 million Americans have prediabetes
- New-onset T2DM occurs in approximately $> 5\%$ of patients with HIV on PIs with
 - 15% develop prediabetes

CDC Data and Statistics. <http://www.cdc.gov/diabetes/data/index.html>. Accessed January 10, 2019

T2DM Pathophysiology



ADA Testing Criteria

- Consider testing in all adults who are overweight (BMI ≥ 25 kg/m² or ≥ 23 kg/m² in Asian Americans) with one or more additional risk factors:
 - Physical inactivity
 - First-degree relative with diabetes
 - High-risk race/ethnicity (African American, Latino, Native American, Asian American, Pacific Islander)
 - Women delivering a baby >9 lbs or diagnosed with gestational diabetes
 - Hypertension ($\geq 140/90$ mmHg or on antihypertensive medication)
 - HDL cholesterol level <35 mg/dL and/or a triglyceride level > 250 mg/dL
 - Women with polycystic ovary syndrome
 - HbA1c $\geq 5.7\%$, impaired glucose tolerance or impaired FBG on previous laboratory test
 - Other manifestation associated with insulin resistance (e.g., severe obesity, acanthosis nigricans)
 - History of CVD
- For all patients, testing should begin at 45 years of age.
 - If results are normal, repeat at a minimum of 3-year intervals
 - Perform yearly testing if results indicate prediabetes



Considerations in HIV

- Be aware of HbA1c limitations
- Consideration can be made for using FBG instead of HbA1c
- Testing for T2DM and prediabetes should occur prior to starting ART, at the time of switching ART, and 3-6 months after changing ART therapy
 - If BG is within range, follow up annually
- Concern in switching ART therapy if impaired glucose tolerance develops
- Be mindful of potential drug interactions

ADA Prediabetes vs. T2DM

Prediabetes Classification

- FPG: 100-125 mg/dL
OR
- **HbA1c: 5.7-6.4%**
OR
- 2hr postprandial 75 gram oral glucose tolerance test: 140-199 mg/dL

T2DM Diagnosis*

- FPG: ≥ 126 mg/dL
OR
 - **HbA1c: $\geq 6.5\%$**
OR
 - Random BG: ≥ 200 mg/dL with symptoms of hyperglycemia
OR
 - 2hr postprandial 75 gram oral glucose tolerance test: ≥ 200 mg/dL
- *Consider limitations of HbA1c**
- *Two abnormal readings from the same sample to confirm diagnosis**

Diabetes Goals*: ADA vs. AACE

ADA

- **HbA1c goal: <7%**
- FBG goal:
 - 80-130 mg/dL
- Pre meal goal:
 - 80-130 mg/dL
- 2 hr PPG:
 - <180 mg/dL

AACE

- **HbA1c goal: $\leq 6.5\%$**
- FBG goal:
 - <110 mg/dL
- 2 hr PPG goal:
 - <140 mg/dL

*Patient specific goals may vary

American Diabetes Association. Standards of medical care in diabetes-2019. Diabetes Care 2019; 42 Suppl 1.

AACE/ACE Comprehensive Type 2 Diabetes Management Algorithm 2018. Endocr Pract. 2018;24(1):91-120.

Therapeutic Lifestyle Changes



Physical Activity

- Aerobic physical activity for overall CV health
 - 150 min moderate-intensity
 - At least 3 days/week (there should not be 2 consecutive days without exercise)
 - Muscle-strengthening activity at least 2 days/week

Physical Activity

- Positive effects on blood glucose and HbA1c
 - Consider counseling regarding decrease in blood glucose
 - May predispose patient to hypoglycemia
- Reduces cardiovascular risk
- Contributes to weight loss
- Improves insulin sensitivity



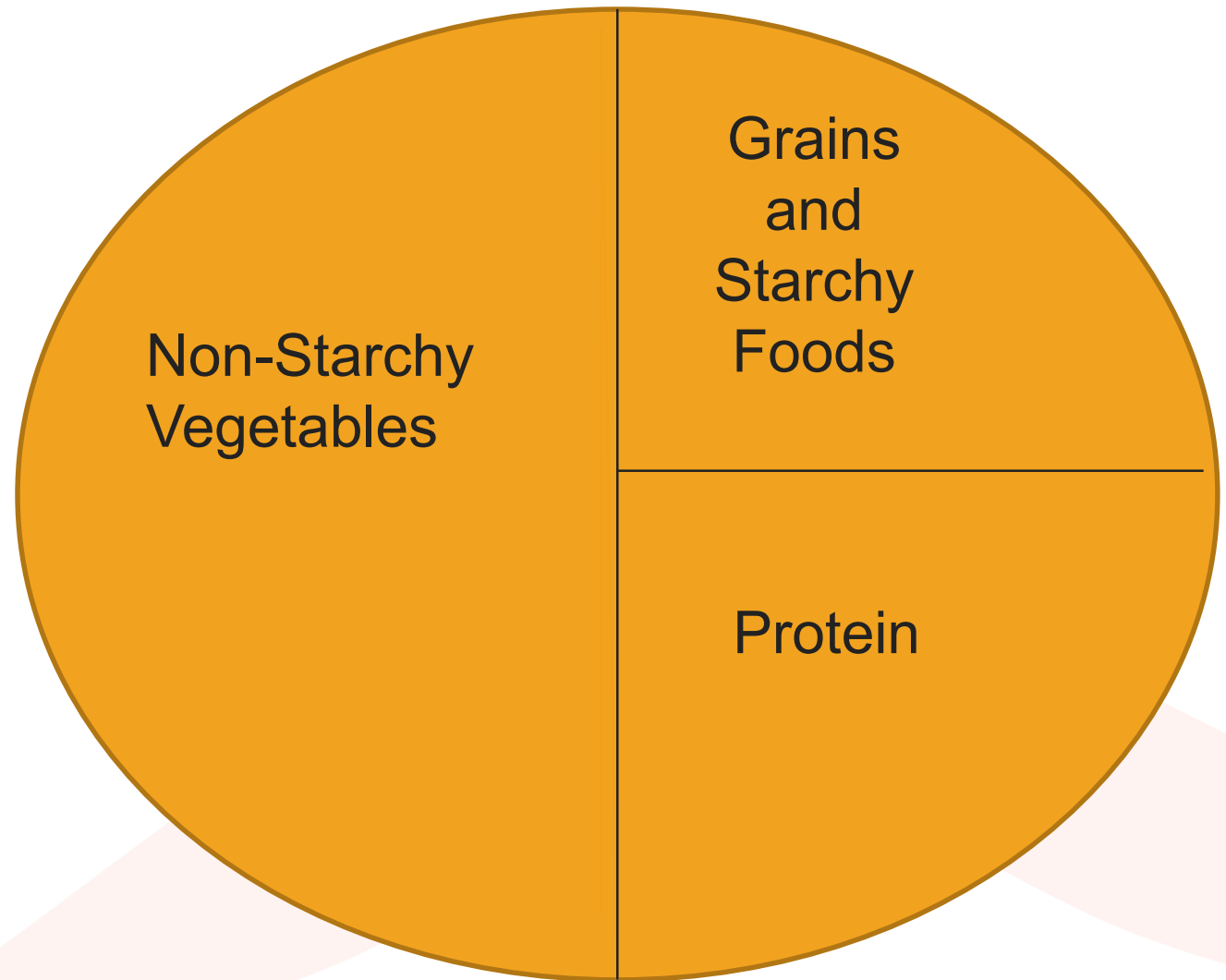
Physical Activity Considerations

- Consider age and exercise history
- Consider initiating low intensity exercise in those with multiple risk factors for CAD with the goal of slow intensification
- Assess patient for contraindications to certain types of exercise
 - Uncontrolled HTN
 - Severe autonomic neuropathy
 - Foot lesions
 - Proliferative retinopathy

Plate Method

Nutrition Facts	
Serving Size 1 cup (40g)	
Servings Per Container 2.5	
Amount Per Serving	
Calories 150	Calories from Fat 10
% Daily Value*	
Total Fat 3g	4%
Saturated Fat 0.5g	2%
<i>Trans</i> Fat 0g	0%
Cholesterol 0mg	0%
Sodium 10mg	1%
Total Carbohydrate 24g	9%
Dietary Fiber 4g	15%
Sugars 1g	
Protein 5g	
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.



<http://www.choosemyplate.gov/sites/default/files/printablematerials/2013-EatTheMyPlateWay.pdf>
Accessed February 23, 2019.

<http://www.diabetes.org/food-and-fitness/food/planning-meals/create-your-plate/>. Accessed March 1, 2019

Plate Method Considerations

- Cultural competence
- Goal setting
- Hidden sugars/carbohydrates
- What about sugar free?

Monitoring

Blood Glucose Testing

- Glucometer
- Test strips
- Lancing Device and Lancet
- Code Chip (if required)
- Log
- Alcohol swab?
- Gauze?
- Control Solution

Control Solution: When To Use it

- Opening a new box of test strips
- Leaving the test strip container open
- Thinking test strips are damaged
- If test strips have been left in extreme temperatures, humidity, or both
- After dropping the meter
- Test results do not match how you feel
- Wanting to verify technique
- ***Control solution expires***



Glucometer Use

- Obtain glucometer, test strip vial, bandage, lancing device, gauze, and alcohol swab (if needed).
- Verify test strips have not expired
- Wash hands with soap and water or alcohol finger and allow to air dry.
 - Do not blow on finger to dry
- Remove one test strip from the test strip vial and immediately close the vial
- Slide the test strip into the meter with the contact bars end first and facing up into the test port
- Verify that the code display on the glucometer screen matches the code printed on the test strip vial (if applicable)

Glucometer Use

- When the blood drop display appears on the glucometer, lance the side of the finger, not the finger pad.
- To lance the finger, hold the lancet up to the side of the finger and apply some pressure. While applying pressure, press the button and that will activate the lancet

Glucometer Use

- Gently massage finger to obtain blood sample (you can massage the finger prior to lancing)
- Place glucometer up to blood sample. Ensure that sample fills entire window on strip. You will know you have enough blood because an hour glass will appear on the glucometer screen
- Place bandage on finger
- Record values in log or glucometer memory

BG Testing

- Non insulin therapies???
- Basal insulin
 - SMBG recommended
- Basal-bolus insulins
 - SMBG recommended
 - Continuous blood glucose monitoring?

Sharps Disposal**

- Acceptable options:
 - **Sharps container (gold standard)**
 - *Metal can*
 - *Coffee/paint*
 - *Thick plastic container*
 - *Laundry detergent bottle*
- Do not discard loose sharps in regular trash or flush down the toilet
 - Do not recycle these items
 - Do not place in clear plastic or glass bottles
- Do not allow sharps to be accessible to others

Other Considerations

- Follow up
 - FPG every 6-12 months or 3 months after ART therapy initiated
 - Annual urinary albumin
- Dilated Eye Exam
 - Annually
- Foot examination
 - Every visit if at high risk for ulcerations
 - Annual examination for everyone
- Dental
 - At least every 6 months
- Immunizations
 - Annual Influenza
 - Pneumonia
 - PCV 13® followed by PPSV23® at least 8 weeks later
 - Hepatitis B series
 - Other vaccine considerations

Summary

- Lifestyle modifications play a key role in the management of T2DM
- Consider the benefits of goal setting
- Consider the patient in decision making

References

- CDC Data and Statistics. <http://www.cdc.gov/diabetes/data/index.html>. Accessed May 1, 2018.
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- American Diabetes Association Food and Fitness. <http://www.diabetes.org/food-and-fitness/food/what-can-i-eat/food-tips/>. Accessed March 1, 2019.



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