

# Medical Management of Type 2 Diabetes Mellitus in the Obese Population

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# Disclosures

- I have no financial disclosure or conflicts of interest with the presented material in this presentation.



# Objectives

- Understanding the relationship between Type 2 Diabetes (T2DM) and Obesity
- Understanding social determinants of T2DM and obesity
- Understanding psychosocial determinants of T2DM and obesity
- Understanding preferred treatment of T2DM in obese patients
- Understanding translation into practice



# T2DM and Obesity – Definitions

- T2DM

- An impairment in the way the body regulates and uses glucose as fuel. This chronic condition results in too much glucose circulating in the bloodstream. Eventually, high blood glucose levels can lead to disorders of the circulatory, nervous, and immune systems.

- Obesity

- A chronic, relapsing, neurobehavioral disease, wherein an increase in body fat promotes adipose tissue dysfunction and abnormal fat mass physical forces, resulting in adverse metabolic, biomechanical, and psychosocial health consequences.



# T2DM and Obesity – Diagnoses

- Prediabetes
  - HgbA1c 5.7% to 6.4%
  - Fasting blood glucose 100 to 125 mg/dL
  - OGTT 140 to 199 mg/dL
- T2DM
  - HgbA1c 6.5% or higher on two separate tests.
  - Fasting blood glucose 126 mg/dL or higher on two separate tests
  - OGTT 200 mg/dL or higher after 2 hours suggests diabetes
- Obesity stage 1 BMI >25 with mild to moderate complications
  - Abnormal WC, BP, HDL, TG
  - OSA with AHI 5-29
  - PCOS without infertility
  - OSA with mild to moderate functional impairment
- Obesity stage 2 BMI >25 with severe complications
  - Prediabetes, metabolic syndrome, diabetes
  - OSA with AHI  $\geq$ 29
  - OA with mod to severe functional impairment
- Obesity
  - Class 1: 30.0 - 34.9
  - Class 2: 35.0 - 39.9
  - Class 3: >40.0
- Waist circumference
  - Men:  $\geq$ 40 inches,
  - Women:  $\geq$ 35 inches



# Anthropometrics and Obesity – Diagnosis

- Men >25% body fat
- Women >32% body fat



# Anthropometrics and T2DM – Diagnosis

- BF% may be more determinant than BMI and even than waist circumference for prediabetes and T2DM development, especially in lean subjects classified by BMI and in males in particular. There is a high degree of misclassification in the diagnosis of obesity when BMI instead of BF% is used, which results in the under-diagnosis of obese patients at risk for T2DM. It is of particular clinical importance to assess BF% to diagnose disturbed glucose tolerance beyond information provided by BMI and waist circumference and try to prevent the development of prediabetes and T2DM especially in male subjects with BMI  $<25$  kg/m<sup>2</sup> and over the age of 40 years.



# T2DM and Obesity – Social Determinants

- T2DM – Adult

- Low socioeconomic status (income) (2-4x more likely to develop T2DM)
- Low education level (2-4x more likely to develop T2DM)
- Access to housing
- Access to nutritious food

- Obesity – Adult

- Race: Black (49.6%), Latino (44.8%), White (42.2%), Asian (17.4%)
- Low socioeconomic status (42.6% below poverty level, 29.7% income greater than 400% of the poverty line)
- Low education levels (35.6% less than HS education, 22.7% college graduates)
- Presentation focused on adult population, but similar results are seen in pediatric population.



# T2DM and Obesity – Psychosocial Determinants

- T2DM/Obesity
  - Chronic stress (influenced by social determinants)
    - Depression
    - Anxiety
    - Reduced self-esteem
    - Decreased energy and motivation
      - Amplification of self-destructive behaviors
        - Tobacco use
        - Excessive alcohol use
        - Consumption of ultra-processed food.
  - Physical manifestations of chronic stress: increased BP, cortisol, blood glucose levels and impaired ability to effectively respond to future stress
  - Over time, adverse physiologic + psychologic responses increase likelihood of developing obesity and T2DM.



# Clinic encounter with Bariatric patients with T2DM

- Annual and symptom based screening for major chronic illnesses
- Adherence to national screening guidelines
- Detailed patient history
- Updated medication list
- Biometric testing
- Anthropometric measurements
- Metabolic testing



# Clinic encounter with Bariatric patients with T2DM (Cont.)

- Referral to registered dietitian
- Referral to behavioral psychologist
- Ongoing follow-up



# Preferred treatment of T2DM in Obese patient

- Lifestyle management
- Pharmacotherapy
- Bariatric surgery



# Lifestyle Management

- Treatment plan should include:
  - Methods to optimize nutrition
  - Methods to optimize fitness
  - Methods to optimize behavior



# Pharmacotherapy

- Preferred medications:
  - Metformin – First-line agent for T2DM and obesity
  - GLP-1 agonists – liraglutide (Victoza), semaglutide (Ozempic, Rybelsus)
  - SGLT-2 inhibitors – Steglatro, Invokana, and Jardiance.
- Diabetic agents causing weight gain
  - Insulin
  - Sulfonylureas



# Bariatric Surgery

- Bariatric surgery can be considered in adults with a BMI of  $>35 \text{ kg/m}^2$  and type 2 diabetes and/or associated comorbidities that are difficult to control with lifestyle modification and pharmacological therapy alone.



# Concomitant Pharmacotherapy + Bariatric Surgery

- Lifestyle modification
- Prescription weight loss – phentermine, Qsymia, Contrave, Saxenda
- Bariatric surgery



# Summary

- Obesity and T2DM are recognized as metabolic diseases
- Body fat percentage is a major predictor of both obesity and T2DM
- Social and psychosocial factors play a major role in both obesity and T2DM
- Comprehensive clinical encounters are necessary to adequately treat obese patients
- Preferred treatment of T2DM in obesity is through lifestyle, GLP-1 receptor agonists, and bariatric surgery



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# QUESTIONS??

Please e-mail any questions regarding this presentation to [kcaffee@monument.health](mailto:kcaffee@monument.health)

Thank you for your time!!

