

EMERGING CHALLENGES AND CLINICAL UPDATES IN PRIMARY CARE

Live Virtual Conference





Obesity Management in Primary Care

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This activity is part of the *Obesity Management in Primary Care Training and Certificate Program* provided by the National Association for Continuing Education (NACE) and the American Academy of Physician Associates (AAPA) in collaboration with The Obesity Society (TOS).

This educational activity is supported by an independent educational grant from Novo Nordisk Inc.

OBESITY MANAGEMENT IN PRIMARY CARE TRAINING AND CERTIFICATE PROGRAM





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Guest Patient 1

"Name not disclosed"



Disclosures

- Angie Golden has disclosed the following financial relationships*:
 - Advisory Boards and Consultant: Novo Nordisk, Gelesis, Currax
 - Speaker: Novo Nordisk
 - Royalties: Springer Nature
- Robert Kushner has disclosed the following financial relationships:
 - Advisory Boards and Consultant: Novo Nordisk, WW, Pfizer, Lilly
 - Speaker: none
 - Research Support: none
- Karli Burridge has disclosed the following financial relationships:
 - Consultant: Novo Nordisk
 - Advisor: Gelesis Biotechnology, Currax Pharmaceuticals, Vivus
 - Speaker's Bureau: Currax Pharmaceuticals, Vivus

Faculty for this educational activity not listed above have no relevant financial relationship(s) to disclose with ineligible companies whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.

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All relevant financial relationships and potential conflicts of interest have been mitigated.

^{*}these are the disclosure relevant to this presentation.



Learning Objectives

Recognize

Recognize obesity as a chronic, relapsing disease with unique, distinct pathophysiology that contributes to adiposity, comorbidities, and complications

Summarize

Summarize long-term pharmacotherapy to manage obesity, including new and emerging pharmacologic agents, based on efficacy and safety data

Develop

Develop individualized treatment plans for patients with obesity that incorporate evidence-based and clinical practice guidelines





Pre-T1: Which of the following factors mediate the link between obesity and comorbidities such as dyslipidemia and insulin resistance?

- 1. Secreted adipocyte factors
- 2. Increased anorexigenic signaling
- 3. Reduced ghrelin production in gut
- 4. Reduced circulating levels of estrogen



Pre-T2: Which of the following medications have demonstrated an average of ≥ 15% weight loss in clinical trials?

- 1. Liraglutide
- 2. Naltrexone/bupropion
- 3. Phentermine/topiramate
- 4. Semaglutide



Pre-T3: 52 y/o man with obesity, T2D, hypertension, dyslipidemia.

Says he is concerned about weight gain over last 10 years (~25 lbs).

Workup: BMI 32.7 kg/m², BP 128/82 mmHg, A1C 6.9%, eGFR 52 mL/min/1.73m².

Meds: Metformin 1000 mg bid, canagliflozin 100 mg qd, lisinopril/hydrochlorothiazide 20 mg/25 mg qd, atorvastatin 80 mg qd.

Lifestyle: Walks briskly for 1 hour 6 days per week; follows a low-calorie, low-fat diet.

Notes that he hates needles and does not want injectable medications.

What would you do next for this patient?

- 1. Recommend bariatric surgery
- 2. Down-titrate obesogenic medications
- 3. Prescribe exenatide, lixisenatide, or dulaglutide
- 4. Discuss benefits of phentermine/topiramate or naltrexone/bupropion



Pre-T4: 38 y/o woman with history of T2D, hypertension, obesity.

Has gained 45 lbs in last 5 years.

Workup: BMI 34 kg/m², BP 142/86 mmHg, A1C 6.7%.

Meds: Lisinopril 20 mg qd, metformin 1000 mg bid, naltrexone/bupropion 2 tablets bid.

Lifestyle: Swims 45 min 5x week, lifts weights 2x week; goes to commercial weight-loss program.

Started naltrexone/bupropion 3 months ago; has lost 5 lbs (2.4% baseline weight) in that time.

What might be appropriate at this time?

- 1. Maintain naltrexone/bupropion for at least 6 months
- 2. Stop naltrexone/bupropion and refer for bariatric surgery
- 3. Continue naltrexone/bupropion and prescribe phentermine
- 4. Discontinue naltrexone/bupropion and prescribe liraglutide or semaglutide



Pre-T5: How confident are you in your ability to select long-term pharmacotherapy to manage patients with obesity?

- 1. Not at all confident
- 2. Slightly confident
- 3. Moderately confident
- 4. Pretty much confident
- 5. Very confident



Pre-T6: How often do you assess comorbidities when considering anti-obesity therapies for patients with overweight/obesity?

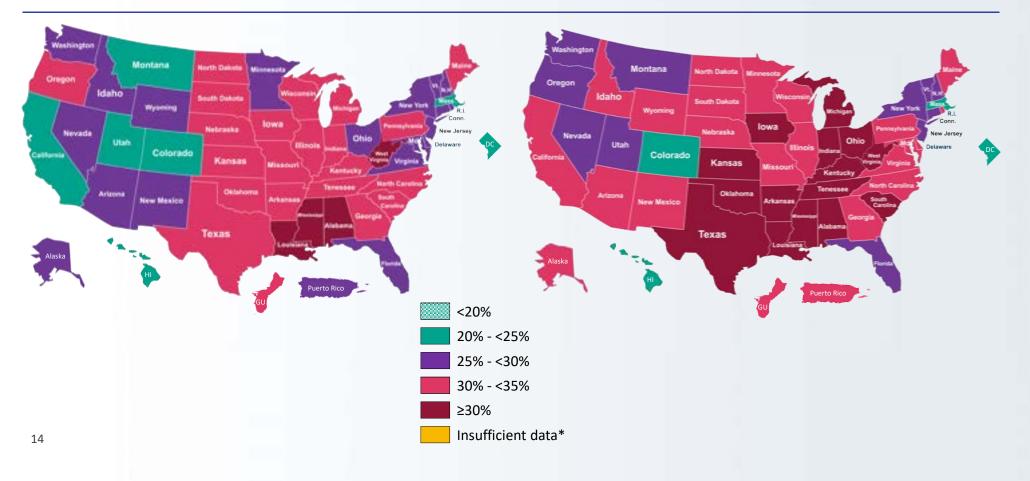
- 1. Never
- 2. Rarely
- 3. Sometimes
- 4. Often
- 5. Always



Understanding Obesity

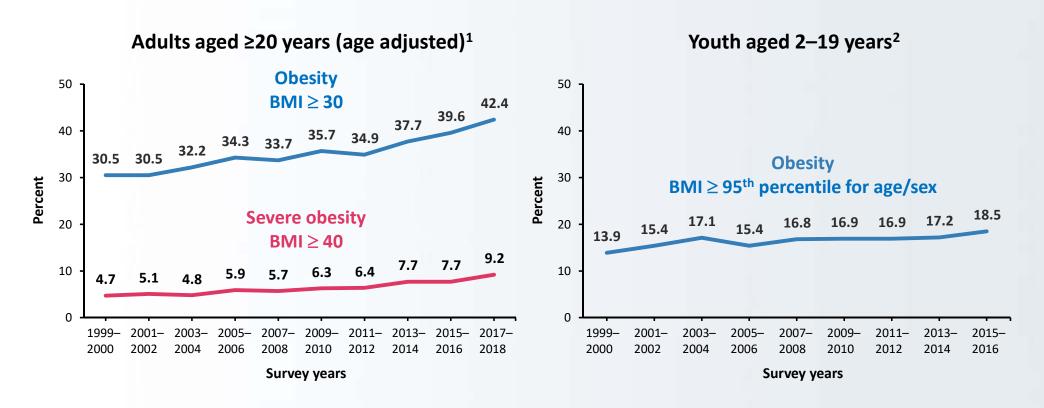
Prevalence of Self-reported Obesity: U.S. Adults by State and Territory, BRFSS 2015—2020







Trends in Obesity Prevalence, United States

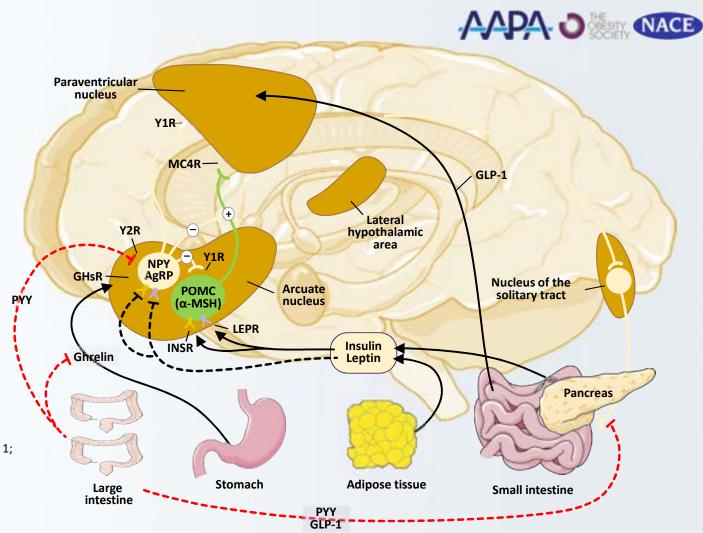


Components of Appetite Regulation/ Dysregulation

Dysregulation of Biosignaling = Obesity

α-MSH, α-melanocyte-stimulating hormone; GHsR, growth hormone secretagogue receptor; INSR, insulin receptor; LEPR, leptin receptor; MC4, melanocortin-4 receptor; POMC, pro-opiomelanocortin; Y1R, neuropeptide Y receptor 1; Y2R, neuropeptide Y receptor 2.

Apovian CM, et al. J Clin Endocrinol Metab. 2015;100(2):342-362.

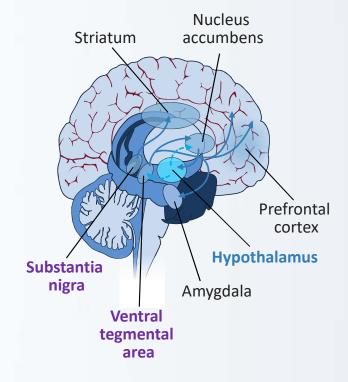






Homeostatic System Hunger / Satiety

- Primarily driven by the arcuate nucleus of the hypothalamus
- Detection and integration of energy state information
 - Leptin, insulin
- Lateral hypothalamus projects to the VTA and receives input from the nucleus accumbens



CNS, central nervous system; VTA, ventral tegmental area. Billes SK, et al. *Pharmacol Res.* 2014;84:1-11.

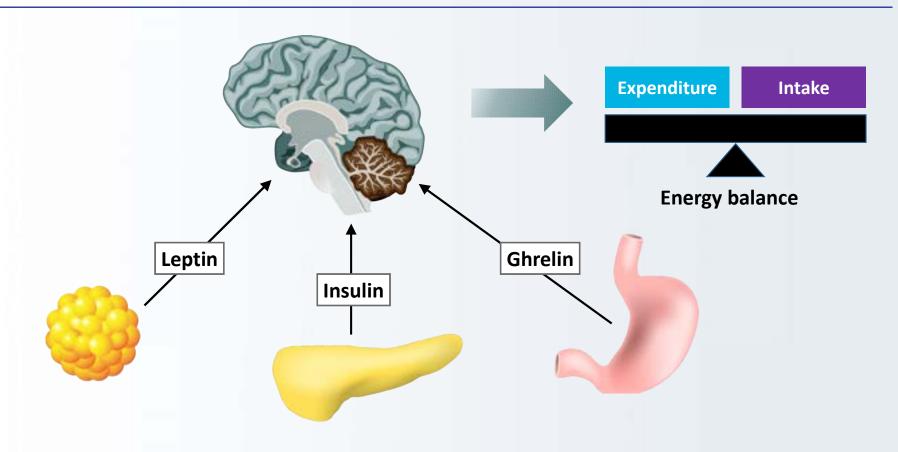
Hedonic or Reward System

- Dopaminergic pathways from the VTA or substantia nigra to regions such as:
 - Striatum (movement, reward salience)
 - Nucleus accumbens (reward, addiction)
 - Prefrontal cortex (decision making, executive function)
 - Amygdala (memory, emotion)

The Pathology of Obesity

Energy Balance Dysregulation

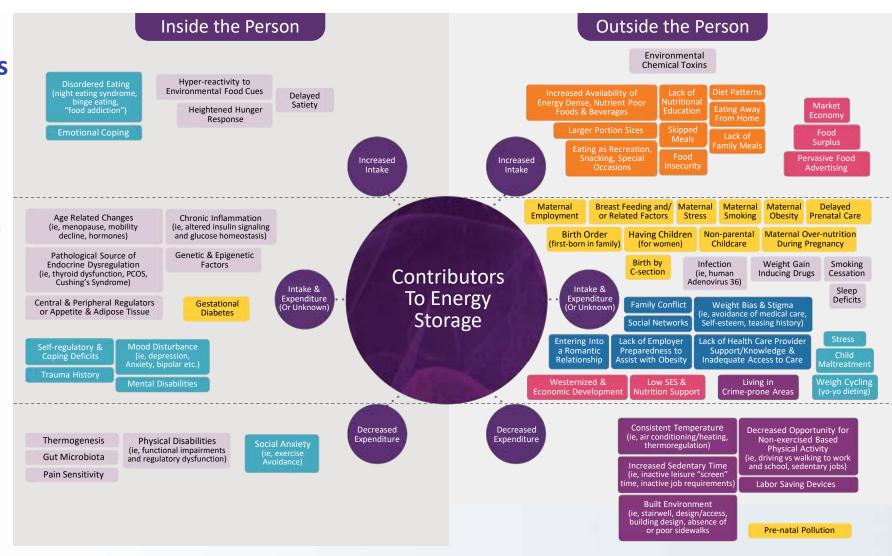




Potential Contributors to Obesity 2015

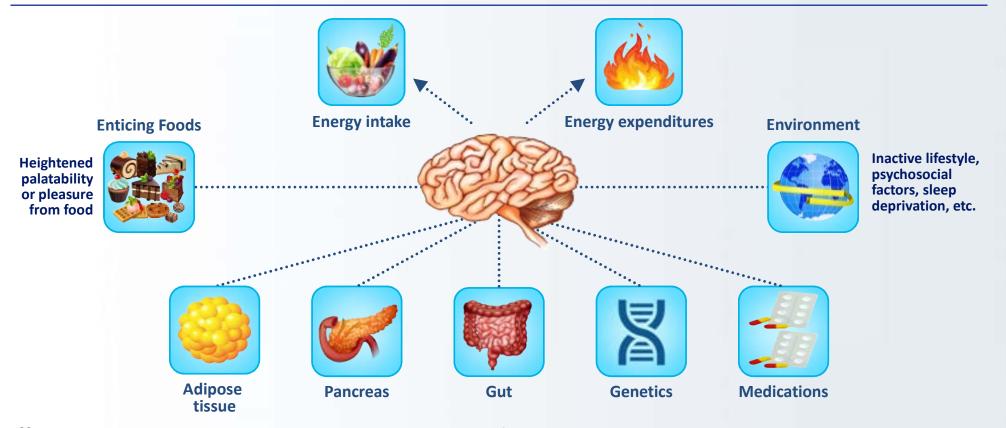
Contributor/Influencer

- Environmental Pressures on Physical Activity
- Biological/Medical
- Maternal/ Developmental
- Economic
- Food and Beverage Behavior/Environment
- Psychological
- Social



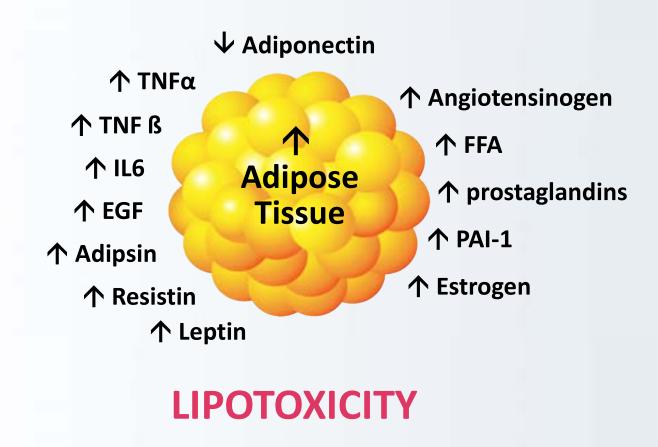


Energy Balance Dysregulation



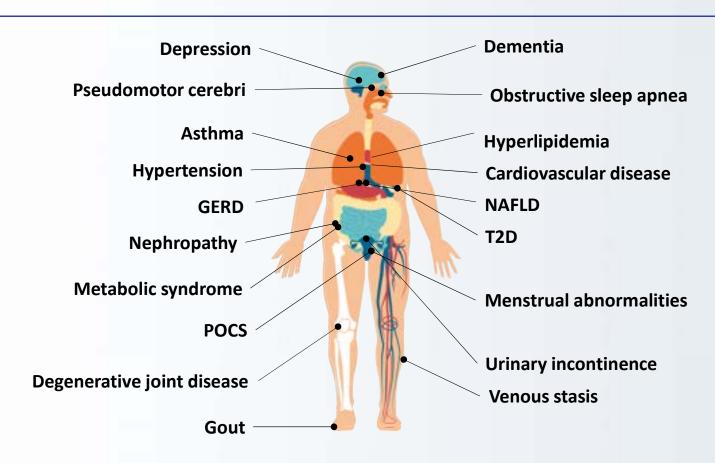
The Pathology of Obesity Organ System Impairment







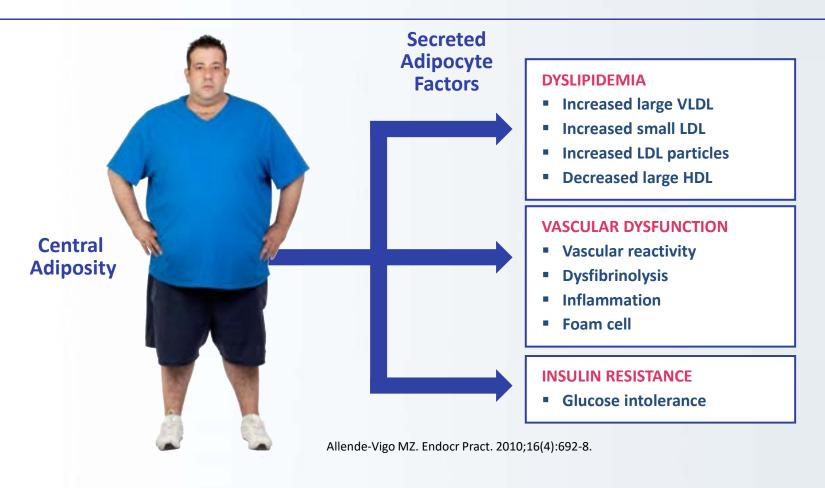
Obesity-Related Diseases



Link Between Pathophysiology of Obesity and Comorbid Conditions

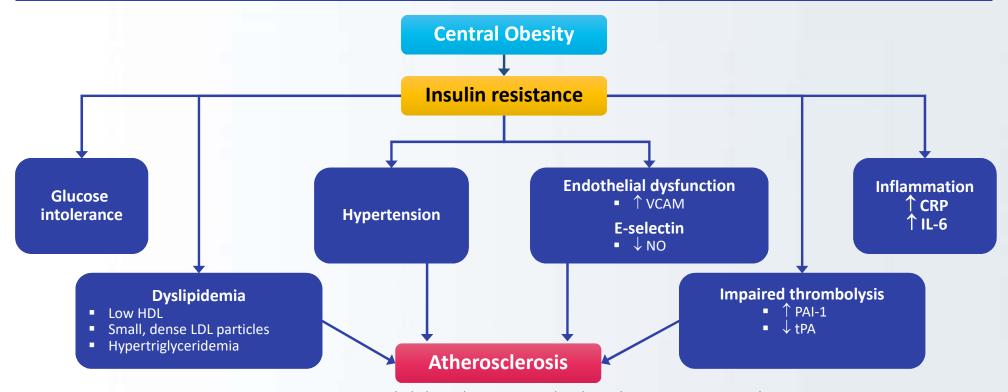
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Association of Insulin Resistance With Cardiovascular Risk Factors and Atherosclerosis





CRP, c-reactive protein; HDL, high-density lipoprotein; LDL, low-density lipoprotein; NO, nitric oxide; PAI-1, plasminogen activator 1; tPA, tissue plasminogen activator; VCAM, vascular cell adhesion molecule McFarlane SI, et al. J Clin Endocrinol Metab. 2001;86(2):713-718.



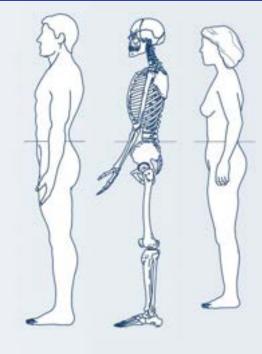
How Do We Define Obesity?

- A condition characterized by excessive accumulation and storage of fat in the body
- Excess adiposity resulting in reduced health and longevity
- An abnormal or excessive fat accumulation that presents a risk to health.

Anthropometry = Science of measuring human body

- ✓ Skinfold thickness and circumferences
- ✓ Bioelectrical impedance analysis (BIA)
- ✓ Dual-energy x-ray absorptiometry (DXA)
- ✓ Air displacement plethysmography
- ✓ Computed Tomography (CT scan)

Measuring tape position for waist (abdominal) circumference



Plethysmography

NHLBI Obesity Education Initiative Expert Panel on the Identification, Evaluation, and Treatment of Obesity in Adults (US). Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report. Bethesda (MD): National Heart, Lung, and Blood Institute; 1998 Sep. Chapter 4, Treatment Guidelines.



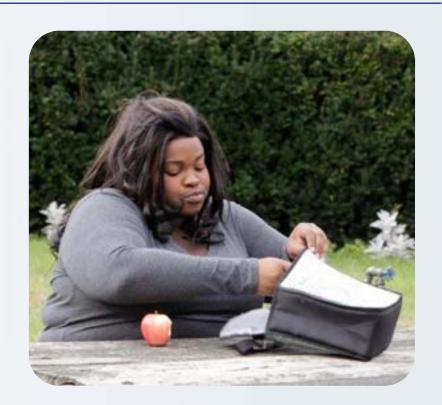
Patient Speaker – Perspectives on Bias





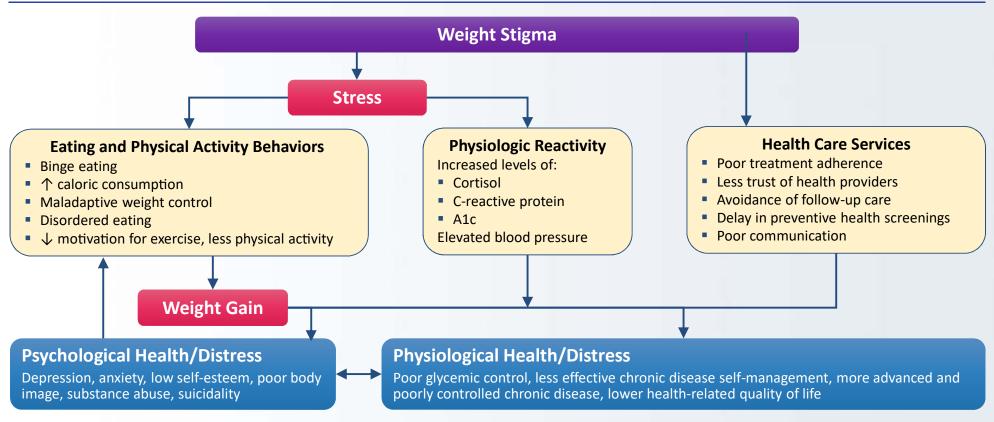
What Is Weight Bias?

- Negative attitudes toward individuals with obesity
- Stereotypes leading to:
 - Stigma
 - Rejection
 - Prejudice
 - Discrimination
- Verbal, physical, relational, cyber
- Subtle and overt





Weight Bias Internalization



Puhl RM, et al. Clin Diabetes. 2016;34(1):44-50.



The Approach to Obesity



Screening and Diagnosis

BMI

- Non-Asian
 - ≥ 25 kg/m² pre-obesity (overweight)
 - \geq 30 kg/m² obesity
- Asian
 - ≥ 23 kg/m² pre-obesity (overweight)
 - ≥ 25 kg/m² obesity

Waist circumference

- Non-Asian
 - > 40 inches in men
 - > 35 inches in women
- Asian
 - > 35 inches in men
 - > 31.5 inches in women

Fat percentage

- Men > 30% obesity; 25%—29% pre-obesity
- Women > 35% obesity; 30%—34% pre-obesity

	BMI ranges (kg/m²)		
Category	Non-Asian descent	Asian descent	
Underweight	< 18.5	< 18.5	
Normal	18.5—24.9	18.5—23.0	
Pre-obesity/ overweight	25—29.9	23—27.5	
Obesity	≥ 30	≥ 27.5	



Staging: Identifying High-Risk Patients

	AACE Staging System		
Stage	BMI (kg/m²) Complications		
0	≥ 25-29.9 OR ≥ 30	No identified complications	
1	≥ 25	≥ 1 mild-to-moderate complications that may be treated effectively by treating obesity	
2	≥ 25	≥ 1 severe complication and may require more aggressive treatment	

	Edmonton Obesity Staging System			
Stage	Obesity-related risk factors	Physical symptoms	Psychological symptoms	Functional limitations
0	None	None	None	None
1	Subclinical	Mild – no medical treatment needed	Mild	QoL not impacted
2	Established ORC with medical intervention	Moderate	Moderate psychological sx (depression, anxiety, eating disorder)	Moderate – QoL is being impacted
3	Significant ORC with end organ damage (MI, heart failure, diabetes with complications)	Significant (incapacitating OA)	Significant (reduced mobility, unable to work or complete ADLs)	Significant – QoL is significantly impacted
4	Severe	Severe	Severe	Severe

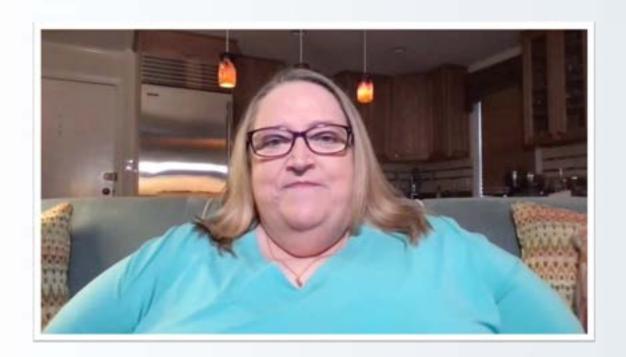


APPROACH: The 5As

ASK	Ask the patient's permission "Would you be willing to discuss your weight and the treatment options?"	
ASSESS	Usual PMH/SH including weight history, family history of obesity, obesogenic medications; review food intake, current activity, sleep duration and stressors	
ADVISE	Advise on treatment options	
AGREE	Utilize motivational interviewing and shared decision making to develop a plan of treatment from the options discussed	
ASSIST	During follow-up visits assist the patient in staying on track, reassessing for needed changes in treatment; referrals and resources	

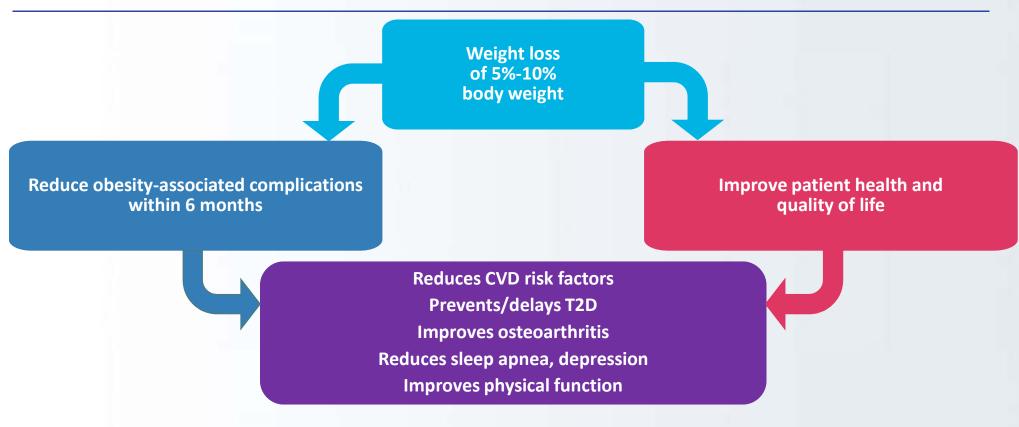
Patient Speaker – Perspectives on the Approach AAPA O MACE to Obesity Management





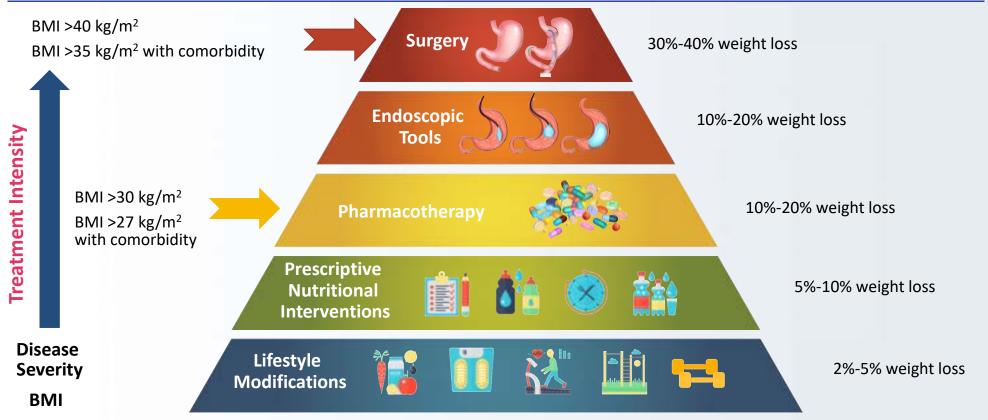


Obesity Management: Therapeutic Goals





Obesity Treatment Pyramid



Tchang BG, et al. Med Clin North Am. 2021;105(1):149-174.



Lifestyle Interventions







Paleo



Vegetarian



Vegan



Mediterranean



Low Carb



DASH



No Sugar



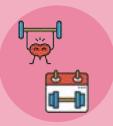
Aerobic exercise

During obesity treatment: 150 min per week

Maintain Weight Loss: 300-400 min per week

ACTIVITY







BEHAVIORAL TECHINQUES

Cognitive-behavioral therapy





Sleep / Circadian enhancement

OTHER HEALTH FACTORS





Obesity Pharmacotherapy

What Is the Primary Purpose of Adjunctive Medications Used in Obesity Treatment?



The primary purpose of anti-obesity medications is to

- Impact the pathophysiology of the disease,
- Facilitate weight loss and health improvements, and
- Support adherence to lifestyle interventions by helping patients change their relationship with food.

Indicated for patients with BMI ≥30 kg/m² or BMI ≥27 kg/m² with a comorbidity





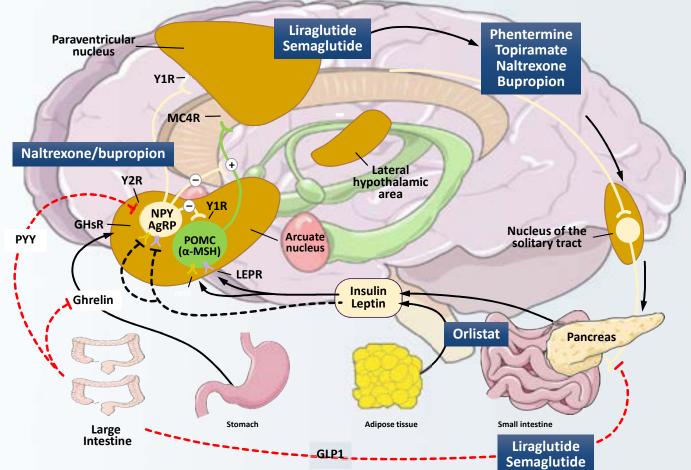


FDA-Approved Medications for Obesity

Agent	Mechanism of Action Effect		Approval Date
Phentermine (Lomaira/Adipex)	Sympathomimetic	Appetite regulation	1959
Orlistat (Xenical or Alli)	Pancreatic lipase inhibition Reduces fat absorption		1999
Phentermine/topiramate ER (Qsymia)	Sympathomimetic, anticonvulsant (GABA receptor modulation, carbonic anhydrase inhibition, glutamate antagonism) Appetite regulation		2012
Naltrexone/bupropion SR (Contrave)	Opioid receptor antagonist Dopamine/noradrenaline reuptake inhibitor Appetite regulation		2014
Liraglutide (Saxenda)	GLP-1 receptor agonist Appetite regulation		2014
Setmelanotide (IMCIVREE)	Melanocortin 4 (MC4) receptor agonist [Indication: Obesity due to POMC, PCSK1, or LEPR deficiency] Appetite regulation		2020
Semaglutide (Wegovy)	GLP-1 receptor agonist	Appetite regulation	2021

Medication Sites of Action



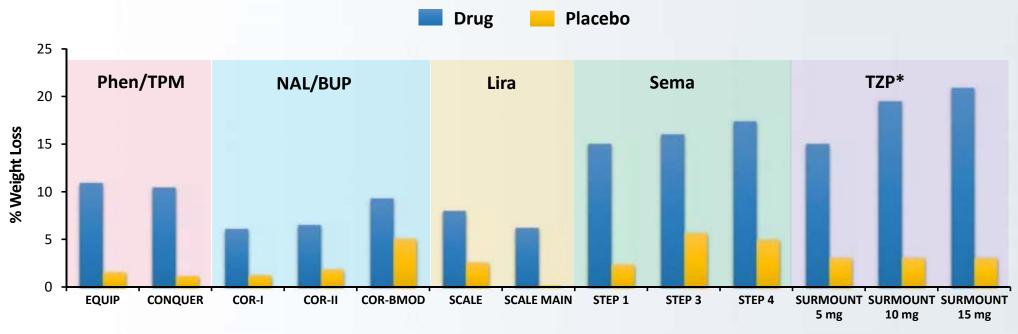


α-MSH, α-melanocyte-stimulating hormone; GHsR, growth hormone secretagogue receptor; INSR, insulin receptor; LEPR, leptin receptor; MC4, melanocortin-4 receptor; POMC, pro-opiomelanocortin; Y1R, NPY Y1 receptor; Y2R, NPY Y2 receptor.

Apovian CM, et al. *J Clin Endocrinol Metab.* 2015;100(2):342-362.

Average Percent Weight Loss (Drug vs. Placebo) from Randomized, Controlled Trials





*Not FDA approved for obesity

Phen/TPM, phentermine + topiramate; NAL/BUP, naltrexone + bupropion; Lira, liraglutide; Sema, semaglutide; TZP, tirzepatide

Allison DB et al. Obesity (Silver Spring). 2012;20(2):330-42; Gadde KM et al. Lancet. 2011;377:1341-52; Greenway FL et al. Lancet. 2010;376: 595-605; Apovian CM et al. Obesity (Silver Spring). 2013;21(5):935-43; Wadden TA et al. Obesity (Silver Spring). 2011;19(1):110-20; Davies MJ et al. JAMA. 2015;314(7):687-99; Wilding JPH et al. N Eng J Med. 2021;384(11):989-1002; Wadden TA et al. JAMA. 2021;325(14):1403-13; Rubino D et al. JAMA. 2021;325(14):1414-25; Jastreboff AM et al. N Eng J Med. 2022 Jun 4. doi: 10.1056/NEJMoa2206038.



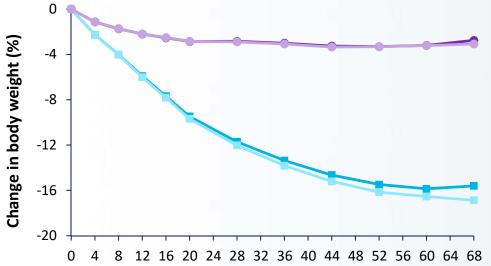
Emerging Anti-obesity Pharmacological Therapies

Category	Mechanism	Drug	Stage of Development
	GLP-1 RA	Semaglutide	Approved 2021
Hormonal	GLP-1/GIP RA GLP-1/glucagon RA GLP-1/GIP/glucagon Amylin analogue GLP-1/amylin analogue Ghrelin antagonist PYY analogue GLP-1 small molecule RA	Tirzepatide Cagrilintide Danuglipron	Approved for T2D 2022 Phase 2 Phase 2 Phase 2 Phase 1 Phase 1 Phase 1 Phase 1 Phase 1
Neuropeptide	Melanocortin-4 RA	Setmelanotide	Approved 2020 for rare genetic conditions
Enzyme inhibition	Sodium-glucose transporter-1 and 2 (SGLT1, SGLT2 inhibitor)	Licoglifloxin	Phase 2
Monoamine receptor uptake inhibition	Noradrenaline, dopamine, serotonin update inhibitor	Tesofensine	Phase 3
Monoclonal antibody	Activin type II RA	Bimagrumab	Phase 2



Semaglutide: STEP 1 Trial

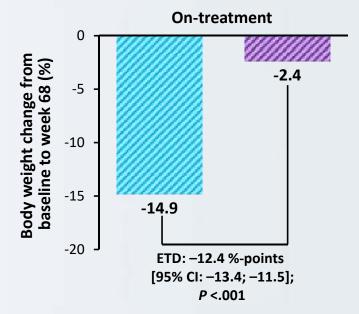
Observed body weight change over time



Time since randomisation (weeks)



Estimated change from baseline to week 68



Semaglutide 2.4 mg (N=1306) // Placebo (N=655)

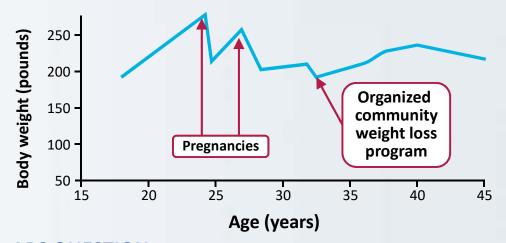


Individualizing Obesity Management

ARS Question 1 Case 1: Ms. York



- 44 y/o female presents for well-woman visit.
- PMH: GERD, hypertension, depression, NAFLD, insulin resistance.
- Meds: Metoprolol 20 mg qd, omeprazole 20 mg qd, vortioxetine 20 mg qd, metformin 1000 mg bid.
- **Ask:** Patient gives permission to discuss her weight.
 - Reports 30-lbs weight gain in past 3 years.
- Assess:
 - · Body-weight graph (above right)
 - Walks 20 min/day, 6 days/week
 - Tries to eat carefully everyday
 - Sleeps 7 hours most nights
 - Two teenage children at home



ARS QUESTION:

ARS-T1: What obesogenic medication is this patient taking?

- 1. Metformin
- 2. Metoprolol
- 3. Omeprazole
- 4. Vortioxetine

ARS Question 2 Case 1: Ms. York, Cont'd



- Vitals: BP 126/72 mmHg, HR 82 bpm, RR 16 bpm.
- Biometrics: Height 5'6", weight 216 lbs, BMI 34.86 kg/m2, waist circumference 42".
- Screening tools: PHQ9 (score 4), BED7 (negative), STOP-BANG (score 2).
- Shared decision making:
 - Eating plan: Discuss very low calorie diet (VLCD) with meal replacement plan.
 - Activity: Increase steps to 7500 per day, add resistance training 2x per week.
- Replaced metoprolol with ACE inhibitor.
- Follow-up visit in 2 weeks.

ARS QUESTION:

ARS-T2: You are considering whether to start antiobesity medication (AOM). What are the criteria for starting pharmacotherapy?

- Initiate AOM only for adults with BMI ≥30 kg/m²
- 2. Initiate AOM for adults with BMI ≥30 kg/m² or ≥27 kg/m² with comorbidities
- 3. Initiate AOM for adults with BMI ≥35 kg/m² or ≥30 kg/m² with comorbidities
- Initiate AOM for adults with BMI ≥25 kg/m² who are unable to lose weight with lifestyle changes



Case 2: Mr. Alves

- 52 y/o male presents for diabetes and hypertension follow-up and medication refill.
- PMH: T2D, hypertension, dyslipidemia, osteoarthritis in both knees, NAFLD, OSA.
- Family Hx: Obesity, CVD, T2D.
- Social Hx: No tobacco or alcohol use, no drug abuse.
- Meds: Canagliflozin/metformin 50 mg IR/1000 mg ER qd, lisinopril 40 mg qd, lovastatin 80 mg qd, ibuprofen 400 mg prn (up to tid).
- Ask: Patient gives permission to discuss his weight.
 - Responds: "Will it get me off any of my meds?"

ARS Question 3 Case 2: Mr. Alves, Cont'd



- Vitals: BP 138/78 mmHg, HR 82 bpm, RR 16 bpm.
- Biometrics: Height 6'1", weight 248 lbs, BMI 32.72 kg/m2, waist circumference 43".
- Screening tools: PHQ9 (score 0), BED7 (negative), using CPAP every night.
- Shared decision making:
 - Eating plan: Rejoined community program
 - Activity: Joined a gym, swims 3 days/week
 - Patient reluctant to injectable medications
- No obesogenic medications noted.
- Follow-up in 2 weeks.

ARS QUESTION:

ARS-T3: Which anti-obesity medication would be appropriate for this patient?

- 1. GLP1-RA
- 2. Lipase inhibitor
- 3. Sympathomimetic with GABA receptor modulator
- Opioid antagonist combined with norepinephrine dopamine reuptake inhibitor

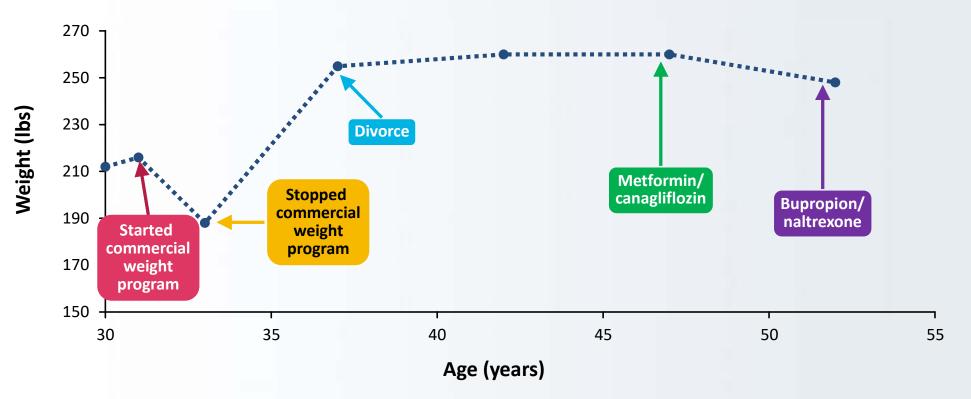


Case 2: Mr. Alves, Cont'd

- Eating plan: Showed record of attending community commercial weight program.
- Activity: Over past 3 weeks has attended gym for weight lifting 2x week and swimming 3x week.
- Behavior: Completed education on obesity as a disease.
- Medication: During shared decision making, patient declines an injectable agent and decides to start bupropion/naltrexone.



Mr. Alves: Body-Weight Graph



ARS Question 4 Case 2: Mr. Alves, Cont'd



- 3 months later.
- Patient has lost 5 lbs (2% baseline weight).
 - Weight now 243 lbs.
 - BMI 32.3 kg/m².
- Reports consistent exercise and participation in commercial weight program.
- Reports adherence to bupropion/naltrexone.

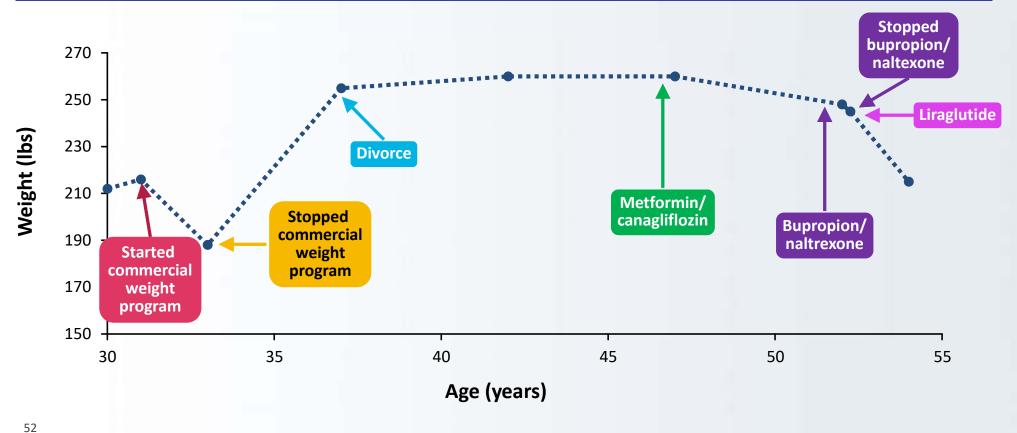
ARS QUESTION:

ARS-T4: What would you recommend now for this patient?

- 1. Add lipase inhibitor
- 2. Maintain current therapy for 1 year
- 3. Switch from bupropion/ naltrexone to GLP-1 RA
- 4. Switch from bupropion/ naltrexone to sympathomimetic with GABA receptor modulator



Mr. Alves: Body-Weight Graph







Post-T1: Which of the following factors mediate the link between obesity and comorbidities such as dyslipidemia and insulin resistance?

- 1. Secreted adipocyte factors
- 2. Increased anorexigenic signaling
- 3. Reduced ghrelin production in gut
- 4. Reduced circulating levels of estrogen



Post-T2: Which of the following medications have demonstrated an average of ≥ 15% weight loss in clinical trials?

- 1. Liraglutide
- 2. Naltrexone/bupropion
- 3. Phentermine/topiramate
- 4. Semaglutide



Post-T3: 52 y/o man with obesity, T2D, hypertension, dyslipidemia.

Says he is concerned about weight gain over last 10 years (~25 lbs).

Workup: BMI 32.7 kg/m², BP 128/82 mmHg, A1C 6.9%, eGFR 52 mL/min/1.73m².

Meds: Metformin 1000 mg bid, canagliflozin 100 mg qd, lisinopril/hydrochlorothiazide 20 mg/25 mg qd, atorvastatin 80 mg qd.

Lifestyle: Walks briskly for 1 hour 6 days per week; follows a low-calorie, low-fat diet.

Notes that he hates needles and does not want injectable medications.

What would you do next for this patient?

- 1. Recommend bariatric surgery
- 2. Down-titrate obesogenic medications
- 3. Prescribe exenatide, lixisenatide, or dulaglutide
- 4. Discuss benefits of phentermine/topiramate or naltrexone/bupropion



Post-T4: 38 y/o woman with history of T2D, hypertension, obesity.

Has gained 45 lbs in last 5 years.

Workup: BMI 34 kg/m², BP 142/86 mmHg, A1C 6.7%.

Meds: Lisinopril 20 mg qd, metformin 1000 mg bid, naltrexone/bupropion 2 tablets bid.

Lifestyle: Swims 45 min 5x week, lifts weights 2x week; goes to commercial weight-loss program.

Started naltrexone/bupropion 3 months ago; has lost 5 lbs (2.4% baseline weight) in that time.

What might be appropriate at this time?

- 1. Maintain naltrexone/bupropion for at least 6 months
- 2. Stop naltrexone/bupropion and refer for bariatric surgery
- 3. Continue naltrexone/bupropion and prescribe phentermine
- 4. Discontinue naltrexone/bupropion and prescribe liraglutide or semaglutide



Post-T5: After completing this activity, how confident are you in your ability to select long-term pharmacotherapy to manage patients with obesity?

- 1. Not at all confident
- 2. Slightly confident
- 3. Moderately confident
- 4. Pretty much confident
- 5. Very confident



Post-T6: After completing this activity, how often do you intend to assess comorbidities when considering anti-obesity therapies for patients with overweight/obesity?

- 1. Never
- 2. Rarely
- 3. Sometimes
- 4. Often
- 5. Always



Post-T7: Approximately how many patients with obesity do you see on a weekly basis, in any clinical setting?

- 1. None
- 2. 1-5
- 3. 6-10
- 4. 11-15
- 5. 16-20
- **6**. 21-25
- 7. >25

