



# Essentials of Obesity Management

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# Objectives

- Discuss guidelines on treatment of obesity
- List available treatment options including lifestyle change, medication management, minimally invasive procedures, and bariatric surgery
- Explain how to apply the evidence on available anti-obesity medications and interventions to formulate individualized treatment plans for chronic weight management

# Prevalence of Obesity Among U.S. Adults

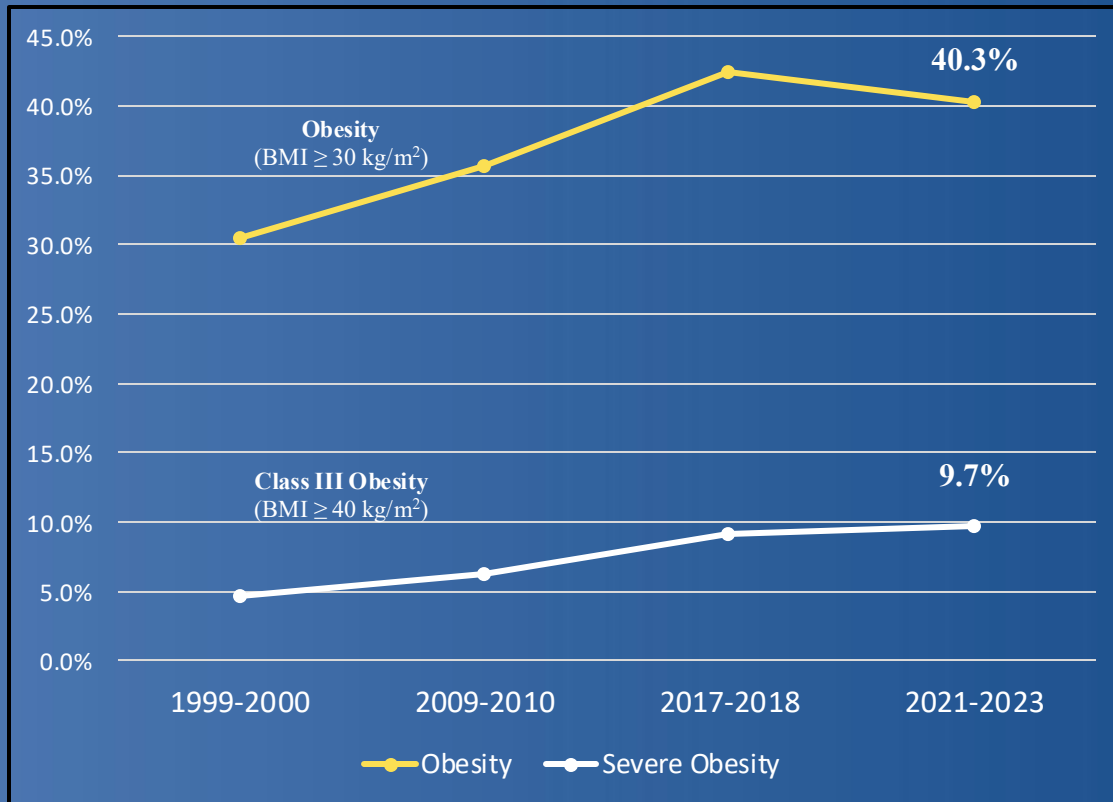


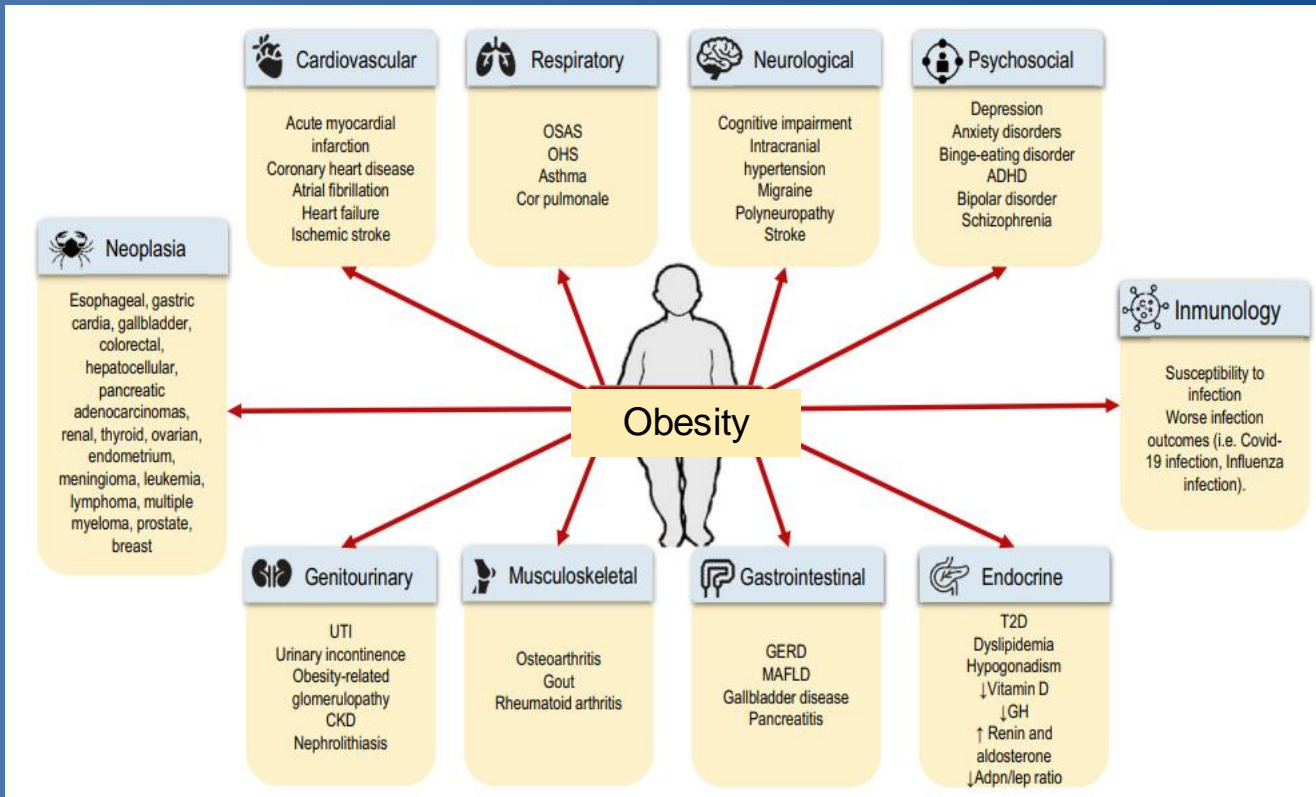
Figure adapted from data from Hales & colleagues (2020) and Emmerich & colleagues (2024)

## USPSTF Screening Recommendation

- Screen all adults for obesity with body mass index (BMI)
  - Obesity diagnosed if BMI ≥ 30 kg/m<sup>2</sup>

Fewer than half of patients with obesity receive weight loss counseling by their PCP

# Obesity-Related Diseases



Obesity is a chronic, relapsing progressive disease

# 2013 AHA/ACC/TOS Weight Management Guidelines

- 3 to 5% weight loss – initial goal
  - Improves glucose and triglycerides
  - Prevents development of diabetes
- 5 to 10% weight loss
  - Improves blood pressure
  - Lowers LDL-c and raises HDL-c
  - Reduces need for medications

# Goals of Weight Management

- Initial goal for weight loss is to achieve a “healthier weight”\* (typically 5-10% body weight loss)
  - **Goal rate of 0.5-1lb loss per week**
    - Achievable for most people
    - Safe
    - Less risk of weight regain

# Goals of Weight Management

<b>Chronic Condition</b>	<b>Minimum % Weight Loss for Clinical Improvement</b>
Type II Diabetes	5-15%
Hypertension	5-15%
Hyperlipidemia	5-10%
Obstructive Sleep Apnea	7-11%
Asthma/Reactive Airway Disease	7-8%
Non-Alcoholic Fatty Liver Disease	4-10% (10-40% to reverse NASH)
GERD	10-15%
Osteoarthritis	10-15%
PCOS and Infertility	5-15%

# Align Treatment Goals with Expected Outcomes

3%

## Initial Goal

- ↓ glucose
- ↓ triglycerides
- Prevent T2DM

5%

## Next Goal

- ↓ BP
- ↓ LDL-c
- ↑ HDL-c
- Improved MASLD

10%

## Next Goal

- ↓ need for medications
- Improved OSA

## **≥ 20% Goal**

May be needed to improve cardiometabolic outcomes for some patients



## EOSS: EDMONTON OBESITY STAGING SYSTEM - Staging Tool

### STAGE 0

- **NO** sign of obesity-related risk factors
- **NO** physical symptoms
- **NO** psychological symptoms
- **NO** functional limitations

Case Example:

Physically active female with a BMI of 32 kg/m<sup>2</sup>, no risk factors, no physical symptoms, no self-esteem issues, and no functional limitations.

*Class I, Stage 0 Obesity*

EOSS Score

WHO Obesity Classification

### STAGE 1

- Patient has obesity-related **SUBCLINICAL** risk factors (borderline hypertension, impaired fasting glucose, elevated liver enzymes, etc.) - *OR* -
- **MILD** physical symptoms - patient currently not requiring medical treatment for comorbidities (dyspnea on moderate exertion, occasional aches/pains, fatigue, etc.) - *OR* -
- **MILD** obesity-related psychological symptoms and/or mild impairment of well-being (quality of life not impacted)

Case Example:

38 year old female with a BMI of 59.2 kg/m<sup>2</sup>, borderline hypertension, mild lower back pain, and knee pain. Patient does not require any medical intervention.

*Class III, Stage 1 Obesity*

WHO CLASSIFICATION OF WEIGHT STATUS (BMI kg/m<sup>2</sup>)

Obese Class I ..... 30 - 34.9  
 Obese Class II ..... 35 - 39.9  
 Obese Class III ..... ≥40

**Stage 0 / Stage 1 Obesity**

Patient **does not meet clinical criteria for admission** at this time. Please refer to primary care for further preventative treatment options.



### STAGE 2

- Patient has **ESTABLISHED** obesity-related comorbidities requiring medical intervention (HTN, Type 2 Diabetes, sleep apnea, PCOS, osteoarthritis, reflux disease) - *OR* -
- **MODERATE** obesity-related psychological symptoms (depression, eating disorders, anxiety disorder) - *OR* -
- **MODERATE** functional limitations in daily activities (quality of life is beginning to be impacted)

Case Example:

32 year old male with a BMI of 36 kg/m<sup>2</sup> who has primary hypertension and obstructive sleep apnea.

*Class II, Stage 2 Obesity*

### STAGE 3

- Patient has **significant** obesity-related end-organ damage (myocardial infarction, heart failure, diabetic complications, incapacitating osteoarthritis) - *OR* -
- **SIGNIFICANT** obesity-related psychological symptoms (major depression, suicide ideation) - *OR* -
- **SIGNIFICANT** functional limitations (eg: unable to work or complete routine activities, reduced mobility)
- **SIGNIFICANT** impairment of well-being (quality of life is significantly impacted)

Case Example:

49 year old female with a BMI of 67 kg/m<sup>2</sup> diagnosed with sleep apnea, CV disease, GERD, and suffered from stroke. Patient's mobility is significantly limited due to osteoarthritis and gout.

*Class III, Stage 3 Obesity*

### STAGE 4

- **SEVERE** (potential end stage) from obesity-related comorbidities - *OR* -
- **SEVERELY** disabling psychological symptoms - *OR* -
- **SEVERE** functional limitations

Case Example:

45 year old female with a BMI of 54 kg/m<sup>2</sup> who is in a wheelchair because of disabling arthritis, severe hyperpnea, and anxiety disorder.

*Class III, Stage 4 Obesity*

- BMI
- Comorbidities
- Physical symptoms
- Psychological symptoms
- Functional limitations
- Quality of life

# Limited Clinician Engagement in Weight Management Services

- Clinicians unlikely to counsel patients about weight loss or formally refer to a weight loss program
  - Majority of physicians reported limited efficacy in weight management
  - Many feel unprepared with respect to training, in addition to limited time and reimbursement for services
  - Weight management considered unrewarding or futile
  - Avoid discussing weight and weight loss entirely when trying to balance multiple priorities during the visit

# The Challenge of Weight Stigma in Healthcare Settings

- Clinicians frequently cited as source of stigma
  - Less engagement in rapport building with patients with obesity
  - Patients with obesity more likely to doctor shop and avoid/delay seeking medical care
  - Differences in examination and clinical decision-making by clinicians have been documented for patients with obesity
- Physical environment of the clinic may propagate stigma
  - Appropriate size equipment and devices unavailable to accommodate patients of any size

# Patients have greater weight loss success if their clinician...

- Patients who discussed weight loss with their doctor & did not perceive judgment are more likely to achieve a 10% weight loss

Figure 2. Predicted probabilities for self-reported weight loss outcomes in the last 12 months across different PCP judgment-weight loss discussion groups

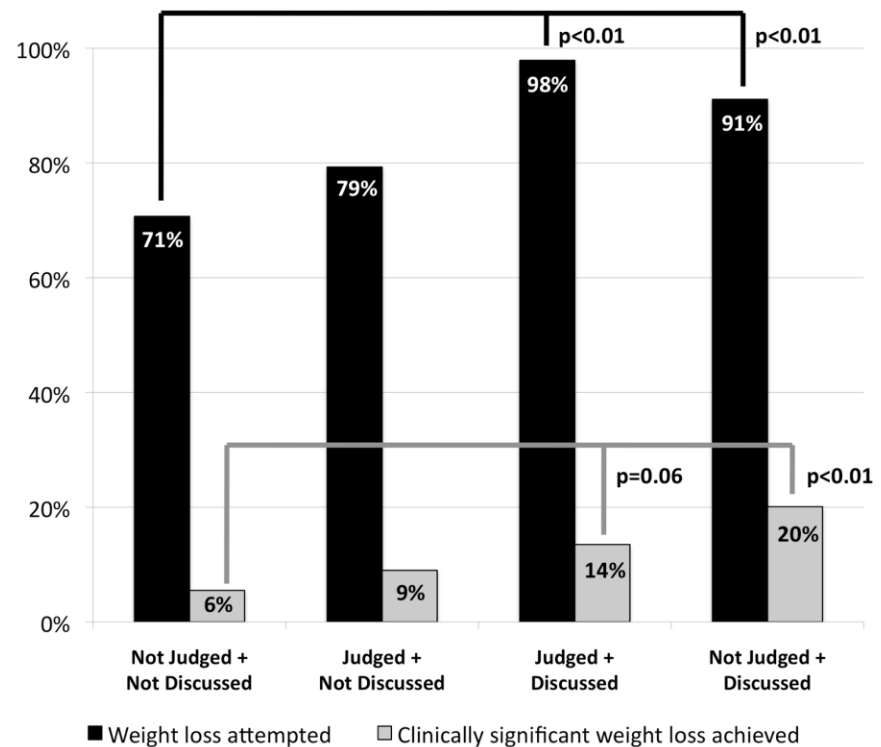
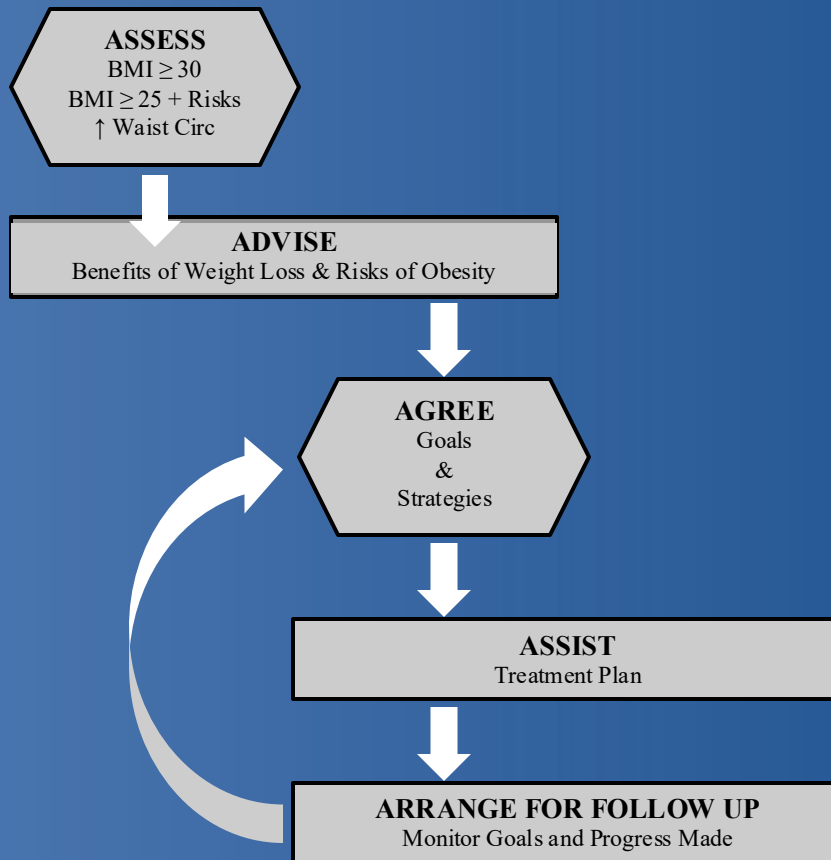


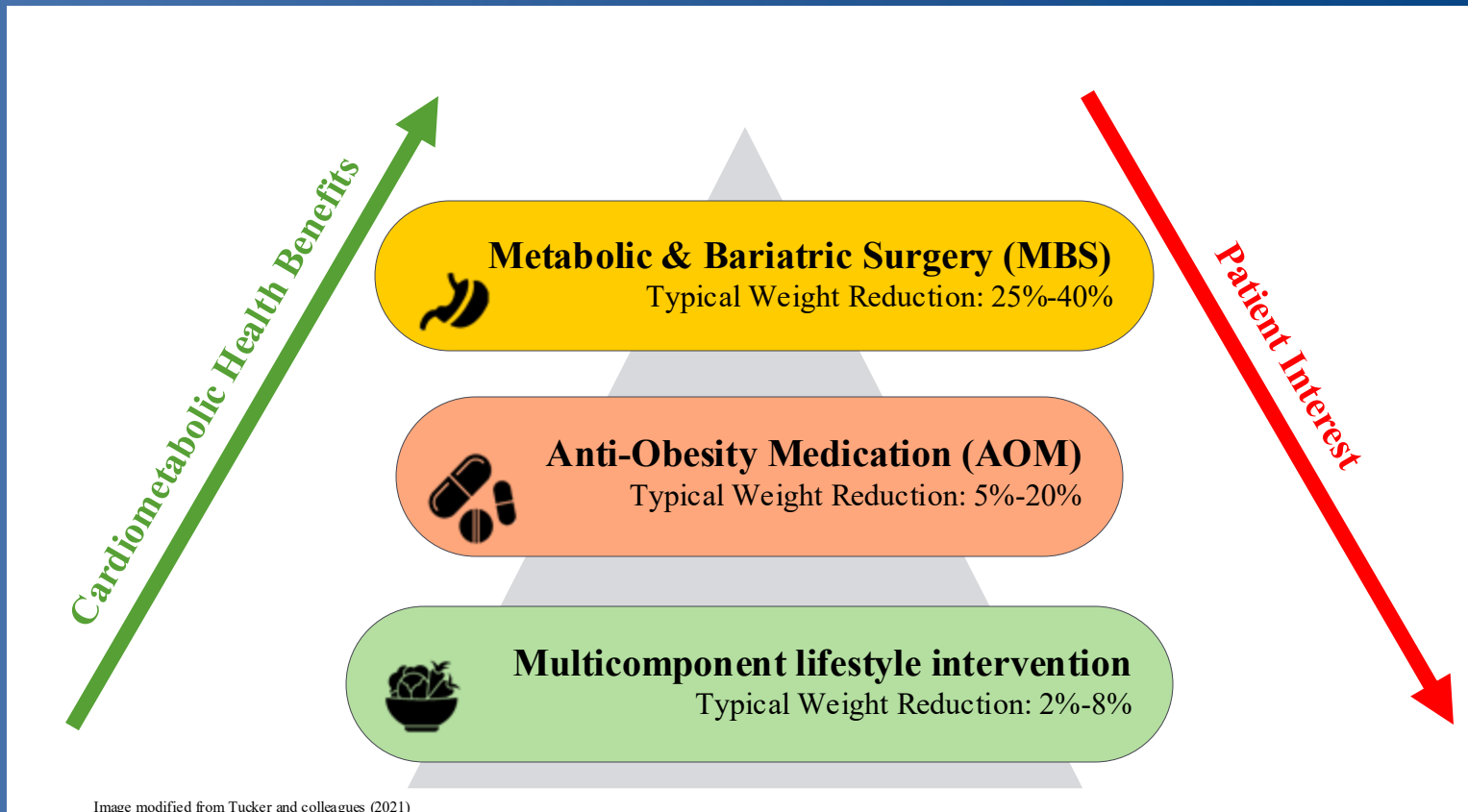
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# Clinicians' Communication on Obesity Matters!



- Clinician counseling on weight reduction → modest weight loss
- Using the **5As framework** when counseling on weight loss...
  - Associated with dietary change and increased patient confidence to lose weight
  - Clinician 5As curriculum → higher quality counseling & patient weight loss
- Using **MI consistent techniques** when discussing weight loss...
  - Associated with greater patient confidence to make dietary changes & greater weight loss

# Obesity Treatment Pyramid



# 2013 AHA/ACC/TOS Weight Management Guidelines

- Enroll in a *high-intensity comprehensive lifestyle program* for at least 6 months
  - Encourages a lower-calorie diet and increased physical activity by using behavioral strategies
  - “High-intensity”  $\geq 14$  sessions in 6 months
  - In-person programs with multidisciplinary teams
    - Telephone/electronically delivered programs that include personalized feedback from a trained interventionist can be an alternative  $\rightarrow$  magnitude of weight loss may be smaller
  - Average weight loss 8kg or 5-10% weight loss

## Weight Management Guidelines

- Primary Focus for PCPs: Enroll in an ***intensive multicomponent behavioral intervention*** for 12-24 months
  - Encourages lower-calorie diet\*, increased physical activity, self-monitoring & provides tools to support weight loss
  - Intensive  $\geq 12$  sessions in first 12 months
  - Heterogeneous intervention and interventionist characteristics
    - Few trials included PCPs in the interventions
  - Minimal harms
  - Lower risk of diabetes development (main health outcome)
- Same intervention for children/adolescents



- What to eat?

- Various dietary approaches produce weight loss, if reduction in energy intake is achieved
- Little difference in weight loss achieved between dietary types
  - Low-fat; low-carbohydrate; meal replacements; etc
- Adherence to nutritional strategy linked with greater weight loss

- How much to eat?

- Calorie goal
  - Women: 1200-1500 daily
  - Men: 1500-1800 daily
- Calorie deficit from baseline
  - 500-750 calories less per day

**+ Behavioral Strategy:  
Calorie Tracking, Meal  
Planning, Portion Control,  
Problem Solving**

# Physical Activity

- **Exercise should be adjunct to diet, and not sole weight loss strategy**
- Aim for 150 min/week moderate intensity or 75 min/week vigorous intensity exercise for weight loss.
- Exercise **critical** for **weight maintenance**
  - Higher levels of physical activity typically needed to maintain lost weight or minimize weight regain long-term
    - **200 to 300 minutes/week**

# Weight Loss Maintenance

- Usual pattern undergoing a lifestyle intervention → maximum weight loss achieved at 6 months, followed by plateau and gradual regain over time

Meta-analysis showed that after 4.5 years mean weight loss maintained with lifestyle change alone was only 3 kg (3.1%)

- Advise patients who have lost weight to participate long-term in a comprehensive weight loss maintenance program.
  - Prescribe face-to-face or telephone-delivered weight loss maintenance programs that provide regular contact (at least monthly) with a trained interventionist
  - Participants should engage in high levels of physical activity (200-300 minutes/week) with combination of aerobic and resistance training to maintain metabolism
  - Monitor body weight regularly (at least weekly)
  - Consume a reduced-calorie diet

# Anti-Obesity Medications (AOMs)

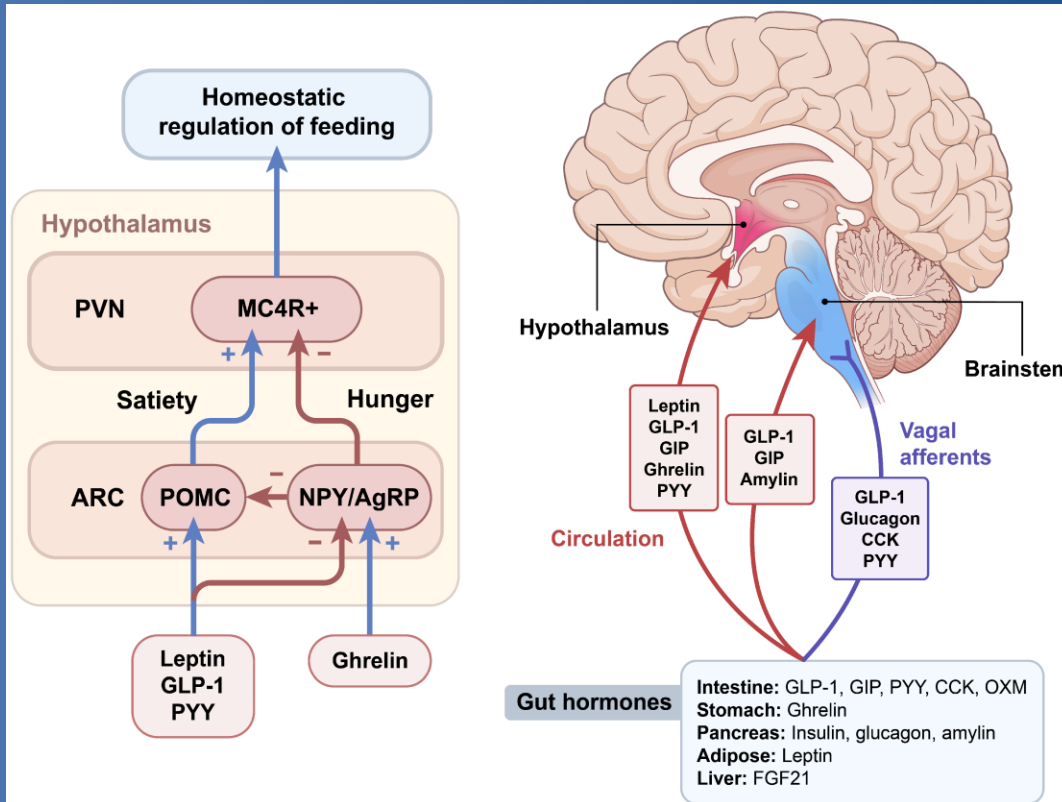


Image modified from Roh E & Choi KM. *Int J Mol Sci.* 2023, 24(4), 3384.

## 2018 USPSTF Weight Management Guideline: Lifestyle modification + pharmacotherapy →

- Greater weight loss at 12-18 months
- Greater weight loss maintenance at 12-36 months

# When to consider AOM...

**BMI  $\geq 30$  kg/m<sup>2</sup>  
or  
BMI  $\geq 27$  kg/m<sup>2</sup>  
with weight-related  
condition**

## **DIFFICULTIES WITH LIFESTYLE CHANGE**

Add AOM if unable to reduce weight or improve weight-related conditions with lifestyle alone

## **WEIGHT REGAIN ON LIFESTYLE MODIFICATION**

Add AOM if weight regain occurs after initial success with lifestyle alone

## **PRESENCE OF WEIGHT-RELATED CONDITIONS**

Start AOM concurrent with lifestyle change to achieve sufficient weight reduction to improve the condition

# Key Obesity Pharmacotherapy Guidelines



- Use medications as adjunct to diet, exercise, and behavioral counseling for individuals...
  - BMI  $\geq 30$  or  $\geq 27+$  with comorbidity
  - Unable to lose and successfully maintain weight
  - Meet label indications
- Assess efficacy and safety monthly for the first 3 months, then every 3 months thereafter
  - At 3 months, if loss is 5% or more, continue; if not, discontinue and seek alternative approaches
- Medications may promote weight-loss maintenance if continued long-term

# Centrally Acting AOM: Phentermine

Time Point	Mean Weight Change	Mean SBP Change	Mean LDL-C Change	Mean WC Change
6M	-6.1%	-6 mmHg	NR	-6.6 cm

Common adverse effects	Mechanism of action
Xerostomia (12%), insomnia (11%), headache (10%)	Sympathomimetic amine

# Centrally Acting AOM: Phentermine

Medication, US approved population, and cost <sup>a</sup>	Administration and titration	Drug interactions	Patient populations with obesity			Strategies to improve safety and tolerability related to common adverse effects
			Consider use	Use with caution	Avoid use <sup>b</sup>	
Phentermine <sup>32,33</sup> ≥16 y \$40-\$95/mo Discounts/coupons available online to reduce to approximately \$8/mo; generic formulations may be available in some countries	Oral tablet or capsule taken daily in the morning (15 mg, 30 mg, or 37.5 mg) <sup>c</sup> Oral tablet taken up to 3 times a day (8 mg) <sup>c</sup> Manufacturer-recommended titration: none	Alcohol MAOIs	Adults with: No AOM coverage for lowest out-of-pocket costs	History of: Insomnia Insufficient sleep Frequent constipation	History of: CVD Substance use disorder Agitated states Glaucoma Hyperthyroidism Uncontrolled HTN	Counsel on: Water and dietary fiber intake to reduce dry mouth and constipation Monitor and adjust: HR and BP for increasing with initiation and titration; lower dose Begin on low dose (8 mg or 15 mg daily); titrate slowly to balance weight loss and adverse effects; not all patients need maximum dose



# Centrally Acting AOM: Phentermine-Topiramate

Time Point	Mean Weight Change	Mean SBP Change	Mean LDL-C Change	Mean WC Change
12M	-10.9%	-3 mmHg	-8.4%	-10.9 cm

Common adverse effects	Mechanism of action
Paresthesia (20%), xerostomia (19%), constipation (16%), headache (11%)	Sympathomimetic amine combined with GABA augmentation

## Observational study of AOM + VLCD + exercise + CBT in real-world clinical setting

- Mean weight loss: 12.1% with AOM over 12 months (multiple combinations used)
- Limited mood effects, except among those treated with topiramate (including combination of phentermine-topiramate)

# Centrally Acting AOM: Phentermine-Topiramate

Medication, US approved population, and cost <sup>a</sup>	Administration and titration	Drug interactions	Patient populations with obesity			Strategies to improve safety and tolerability related to common adverse effects
			Consider use	Use with caution	Avoid use <sup>b</sup>	
Phentermine-topiramate <sup>2,5</sup> ≥12 y \$250/mo Discounts/coupons available online to reduce to approximately \$100/mo	Oral capsule taken daily in the morning <sup>c</sup> Manufacturer-recommended titration: Week 1-2: 3.75/23 mg Week 3-13: 7.5/46 mg Week 14 (3 mo): if 3% reduction in weight (adult) or BMI (adolescent) met: Week 14 and beyond: 7.5/46 mg If 3% reduction not achieved: Week 14-15: 11.25/69 mg Week 16 and beyond: 15/92 mg	Alcohol OCPs Amitriptyline Nonpotassium-sparing diuretics AEDs Carbonic anhydrase inhibitors MAOIs	Adults with: type 2 diabetes to lower A <sub>1c</sub> HTN to lower BP Central adiposity to lower WC Lack AOM coverage as lower out-of-pocket costs	History of: Insomnia Insufficient sleep Frequent constipation Nephrolithiasis MDD Occupation requiring mental acuity	History of: Narrow-angle glaucoma Hyperthyroidism People with pregnancy potential who do not use effective contraception as risk of birth defects (oral clefts)	Counsel on: Water and dietary fiber intake to reduce dry mouth and constipation Irregular bleeding may occur for patients taking OCPs; no change in risk of pregnancy Monitor and adjust: Slowing titration may reduce adverse effects and increase tolerability Lower dose if paresthesia, mood, or cognitive difficulties ("brain fog") impair daily activities Electrolytes before and during treatment to increase Cr and lower HCO <sub>3</sub> ; lower dose if needed

# Centrally Acting AOM: Naltrexone-bupropion

Time Point	Mean Weight Change	Mean SBP Change	Mean LDL-C Change	Mean WC Change
12M	-6.1%	0 mmHg	-2.0%	-6.2 cm

Common adverse effects	Mechanism of action
Nausea (33%), constipation (19%), headache (18%), vomiting (11%), dizziness (10%)	POMC neuron stimulation

# Centrally Acting AOM: Naltrexone-bupropion

Medication, US approved population, and cost <sup>a</sup>	Administration and titration	Drug interactions	Patient populations with obesity			Strategies to improve safety and tolerability related to common adverse effects
			Consider use	Use with caution	Avoid use <sup>b</sup>	
Naltrexone-bupropion <sup>26</sup> ≥18 y \$740/mo Discounts/coupons available online to reduce to approximately \$100/mo	Oral tablet taken up to twice a day (8/90 mg) Manufacturer-recommended titration: Week 1: 1 tablet daily Week 2: 1 tablet twice a day Week 3: 2 tablets every morning and 1 tablet every evening Week 4 and beyond: 2 tablets twice a day	Opioids SSRIs or TCAs Antipsychotics β-Blockers Type 1C antiarrhythmics Digoxin Ticlopidine or clopidogrel Levodopa or amantadine AEDs Antiretroviral drugs MAOIs	Adults with: Type 2 diabetes to lower A <sub>1c</sub> Central adiposity to lower WC Lack AOM coverage as lower out-of-pocket costs with discounts	History of: MDD SMI Liver disease Following a high-fat diet (eg, low-CHO, ketogenic) as increased adverse effects	History of: Substance use disorder Narrow-angle glaucoma Seizure disorder Anorexia or bulimia Uncontrolled HTN Chronic opioid use	Counsel on: Administering evening dose ≥3 h before bedtime to reduce sleep disturbance Water and dietary fiber intake to reduce dry mouth and constipation Lower portion size to manage nausea Interaction with opioids; provide medication management strategy if short-term opioids needed Monitor and adjust: Slowing titration may reduce adverse effects and increase tolerability; not all patients need maximum dose HR and BP increased with initiation and titration; lower dose Headache; lower dose Mood and SI; lower dose or discontinue with SI

# Nutrient-Stimulated Hormone-based AOM: Liraglutide

Time Point	Mean Weight Change	Mean SBP Change	Mean LDL-C Change	Mean WC Change
12M	-8.0%	-4 mmHg	-3.0%	-8.2 cm

Common adverse effects	Mechanism of action
Nausea (39%), diarrhea (21%), constipation (19%), vomiting (16%), injection site reaction (14%), headache (14%), dyspepsia (10%)	GLP-1 receptor agonist

# Nutrient-Stimulated Hormone-based AOM: Liraglutide

Medication, US approved population, and cost <sup>a</sup>	Administration and titration	Drug interactions	Patient populations with obesity			Strategies to improve safety and tolerability related to common adverse effects
			Consider use	Use with caution	Avoid use <sup>b</sup>	
Liraglutide <sup>27</sup> ≥12 y \$1600/mo Discounts/coupons available online to reduce to approximately \$1300/mo	Subcutaneous injection administered daily with multidose pen Manufacturer-recommended titration: Week 1: 0.6 mg Week 2: 1.2 mg Week 3: 1.8 mg Week 4: 2.4 mg Week 5 and beyond: 3.0 mg Of note, prescription for pen needles must be provided (dispensed medication does not include needles for administration)	GLP-1 receptor agonists Insulin Sulfonylureas Meglitinides	Adults with: Type 2 diabetes to lower A <sub>1c</sub> HTN to lower BP Central adiposity to lower WC Adolescents	History of: Frequent nausea Frequent constipation Frequent diarrhea Cholelithiasis Pancreatitis	History of: Severe gastrointestinal disease Suicide attempts <sup>d</sup> Personal or family history of medullary thyroid carcinoma	Counsel on: Rotating injection site location to reduce pain; may use thigh, upper arm, or abdomen Water and dietary fiber intake to reduce constipation Lower portion size to manage nausea Last meal ≥2 h before bedtime to reduce heartburn Refrigerate multi-dose pens (may be kept at room temperature for 30 d) Monitor and adjust: Slowing titration may reduce side effects and increase tolerability; not all patients need maximum dose Hypoglycemia in patients on insulin or sulfonylureas; consider lowering doses of these medications with liraglutide initiation to reduce risk HR increase, particularly among patients with CVD; lower dose or discontinue if needed Mood and SI <sup>d</sup> ; lower dose or discontinue with SI

# Nutrient-Stimulated Hormone-based AOM: Semaglutide

Time Point	Mean Weight Change	Mean SBP Change	Mean LDL-C Change	Mean WC Change
16M	-14.9%	-6 mmHg	NR	-13.5 cm

Common adverse effects	Mechanism of action
Nausea (44%), diarrhea (30%), vomiting (24%), constipation (24%), abdominal pain (20%), headache (14%), fatigue (10%)	GLP-1 receptor agonist

# Nutrient-Stimulated Hormone-based AOM: Semaglutide

Medication, US approved population, and cost <sup>a</sup>	Administration and titration	Drug interactions	Patient populations with obesity			Strategies to improve safety and tolerability related to common adverse effects
			Consider use	Use with caution	Avoid use <sup>b</sup>	
Semaglutide <sup>28</sup> ≥12 y \$1600/mo Discounts/coupons available online to reduce to approximately \$1100/mo	Subcutaneous injection administered weekly with single-dose pen Manufacturer-recommended titration: Week 1-4: 0.25 mg Week 5-8: 0.5 mg Week 9-12: 1.0 mg Week 13-16: 1.7 mg Week 17 and beyond: 2.4 mg Of note, 1.7 mg may be a maintenance dose for adults	GLP-1 receptor agonists Insulin Sulfonylureas Meglitinides	Adults with: Type 2 diabetes to lower A <sub>1c</sub> HTN to lower BP Central adiposity to lower WC CVD to lower major adverse cardiac events HFpEF to lower heart failure symptoms Type 2 diabetes with CKD	History of: Frequent nausea Frequent constipation Frequent diarrhea Cholelithiasis Pancreatitis Diabetes-related eye disease	History of: Severe gastrointestinal disease Suicide attempts <sup>d</sup> Personal or family history of medullary thyroid carcinoma	Counsel on: Rotating injection site location to reduce pain; may use thigh, upper arm, or abdomen Water and dietary fiber intake to reduce constipation Lower dietary fat and portion size to manage nausea Last meal ≥2 h before bedtime to reduce heartburn Take MVI daily to avoid micronutrient deficiencies Refrigerate single-dose pens (may be kept at room temperature for 28 d) Monitor and adjust: Slowing titration may reduce adverse effects and increase tolerability; not all patients need to reach maintenance dose(s) Hypoglycemia in patients on insulin or sulfonylureas; consider lowering doses of these medications with semaglutide initiation to reduce risk HR increase, particularly among patients with known CVD; lower dose or discontinue if needed Mood and SI <sup>d</sup> ; lower dose or discontinue with SI



# Nutrient-Stimulated Hormone-based AOM: Tirzepatide

Time Point	Mean Weight Change	Mean SBP Change	Mean LDL-C Change	Mean WC Change
17M	-20.9%	-8 mmHg	-8.6%	-18.5 cm

Common adverse effects	Mechanism of action
Nausea (28%), diarrhea (23%), vomiting (13%), constipation (11%), abdominal pain (10%), dyspepsia (10%)	GIP/GLP-1 receptor agonist

# Nutrient-Stimulated Hormone-based AOM: Tirzepatide

Medication, US approved population, and cost <sup>a</sup>	Administration and titration	Drug interactions	Patient populations with obesity			Strategies to improve safety and tolerability related to common adverse effects
			Consider use	Use with caution	Avoid use <sup>b</sup>	
Tirzepatide <sup>29</sup> ≥18 y \$1275/mo Discounts/coupons available online to reduce to approximately \$700/mo	Subcutaneous injection administered weekly with single-dose pen Manufacturer-recommended titration: Week 1-4: 2.5 mg Week 5-8: 5.0 mg Week 9-12: 7.5 mg Week 13-16: 10.0 mg Week 17-20: 12.5 mg Week 21 and beyond: 15.0 mg Of note, 5 mg, 10 mg, or 15 mg may be a maintenance dose for adults	GLP-1 receptor agonists Insulin Sulfonylureas Meglitinides	Adults with: Type 2 diabetes to lower A <sub>1c</sub> HTN to lower BP HLD to lower LDL Central adiposity to lower WC Sleep apnea MASH*	History of: Frequent nausea Frequent constipation Frequent diarrhea Cholelithiasis Pancreatitis Diabetes-related eye disease	History of: Severe gastrointestinal disease Suicide attempts <sup>d</sup> Personal or family history of medullary thyroid carcinoma	Counsel on: Rotating injection site location to reduce pain; may use thigh, upper arm, or abdomen Water and dietary fiber intake to reduce constipation Lower dietary fat and portion size to manage nausea Last meal ≥2 h before bedtime to reduce heartburn Take MVI daily to avoid micronutrient deficiencies Refrigerate single-dose pens (may be kept at room temperature for 21 d) Monitor and adjust: Slowing titration may reduce adverse effects and increase tolerability; 3 different maintenance doses available Hypoglycemia in patients on insulin or sulfonylureas; consider lowering doses of these medications with tirzepatide initiation to reduce risk Mood and SI <sup>d</sup> ; lower dose or discontinue with SI

New savings program reduces price of 4-week supply to \$399 for 2.5 mg dose and \$549 for 5 mg dose

Medication	Meta-Analysis: Mean Weight-Loss Greater than Placebo	Other Outcomes	Side Effects	Special Considerations
<b>Orlistat</b>	<b>3.1%</b> (52 RCTs)	↓ <b>A1c</b> ↓ <b>LDL</b> ↓ <b>BP</b>	Flatulence, steatorrhea	TID QAC dosing
<b>Phentermine-Topiramate</b>	<b>8.0%</b> (5 RCTs)	↓ <b>A1c</b> ↓ <b>LDL</b> ↓ <b>BP</b>	Dry mouth, constipation, insomnia, dysgeusia, paraesthesias, cognitive	Reproductive age women
<b>Naltrexone-Bupropion</b>	<b>4.1%</b> (6 RCTs)	↓ <b>A1c</b>	Headache, dizziness, elevated BP	Monitor BP
<b>Liraglutide</b>	<b>4.7%</b> (18 RCTs)	↓ <b>A1c</b> ↓ <b>LDL</b> ↓ <b>BP</b>	Nausea, vomiting, constipation	Daily SQ injection
<b>Semaglutide</b>	<b>11.4%</b> (5 RCTs)	↓ <b>A1c</b> ↓ <b>LDL</b> ↓ <b>BP</b>	Nausea, vomiting, constipation	Weekly SQ injection
<b>Tirzepatide</b>	<b>12.4%</b> (6 RCTs)	↓ <b>A1c</b> ↓ <b>LDL</b> ↓ <b>BP</b>	Nausea, vomiting	Weekly SQ injection

# Weight Gain Promoting Medications

## Diabetes

Insulin, Sulfonylureas, TZDs

## Hypertension

$\beta$ -blockers,  $\alpha$ -blockers

## Depression

SNRIs, some SSRIs, TCAs

## HIV

PIs, NNRTIs

## Serious Mental Illness

Atypical Anti-Psychotics,  
Mood Stabilizers

## Epilepsy

Carbamazepine, Gabapentin,  
Valproate

## Contraception

Progesterone

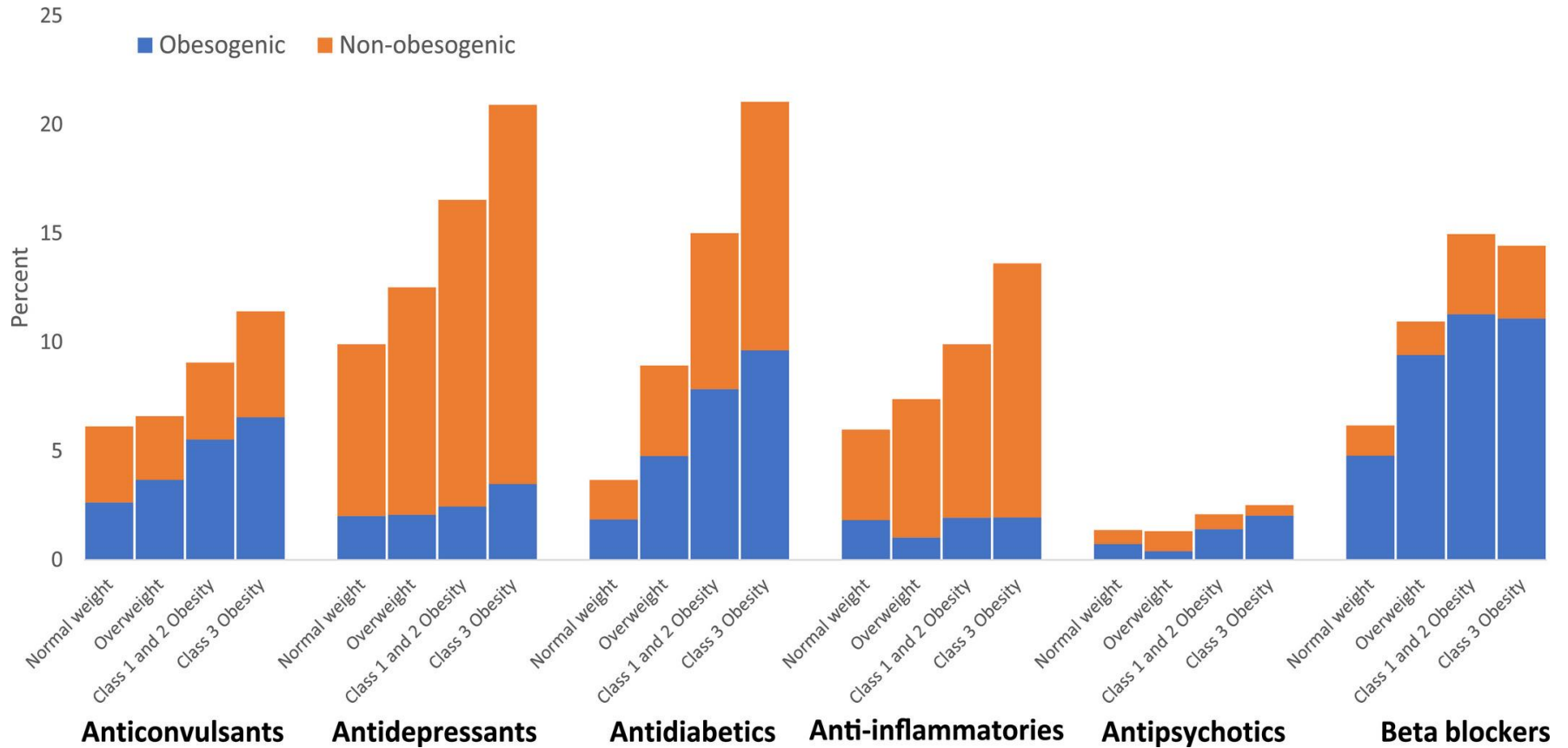
## Allergies

Antihistamines

## Inflammation

Steroids

# Prevalence of Weight-Gain-Promoting Medications among US Adults



# Key Recommendations to tailor pharmacotherapy



## PSYCHIATRIC DISORDERS

Use weight-neutral medications for depression like bupropion or fluoxetine

Use weight-neutral antipsychotics.

Add metformin to prevent weight gain if an anti-psychotic is prescribed.



## HYPERTENSION

Avoid beta-blockers, when possible.

Use weight-neutral medications including ACE inhibitors, ARBs, some CCBs.



## T2DM

Use GLP-1 or GIP/GLP-1 receptor agonists or SGLT2 inhibitors.

For patients who use insulin, add metformin, pramlintide, or GLP-1 to mitigate weight gain.



## CONTRACEPTION

Recommend oral contraceptives or IUDs over injectables

# Barriers to success with AOMs

- Patients are more likely to achieve clinically significant weight loss if they use prescription meds, but long-term persistence tends to be low
  - Improved with shared decision-making process with patient
- Medications can be costly & few are covered by insurance
  - Costs drives non-adherence for many patients
- Most patients do not value modest weight loss
  - Many misperceive the amount of weight loss that they are likely to achieve with medications
  - Counseling on weight loss that may be achieved along with other health benefits may help manage expectations

# Devices Implanted via Minimally Invasive Procedures

- **Intragastric Balloon** (Reshape, Orbera, Obalon)
  - Device deposited in stomach via EGD (or swallow) to induce early satiety – remains in place for up to 6 months
  - Adults with BMI 30-40 kg/m<sup>2</sup>
  - At 6 months, device group lost 14-20% more excess weight than control
    - Risk of weight regain after balloon is removed
  - Complications include abdominal discomfort/pain, nausea, vomiting, GERD, ulceration, obstruction



# Minimally Invasive Procedures

- **Endoscopic Sleeve Gastroplasty**

- Uses an endoscopic suturing (stitching) device to reduce the stomach's size and volume by about 70% without the need for an incision through the skin
- Adults with BMI  $>30$  kg/m<sup>2</sup>
- At 12 months, procedure group had 12-20% weight reduction
- Covered by Medicare

# Bariatric Surgery

- Advise adults with a BMI  $\geq 35$  or BMI  $\geq 30$  with obesity-related comorbid conditions who are motivated to lose weight but who have not reached their weight loss goals through comprehensive lifestyle intervention that bariatric surgery may be an appropriate option to improve health.
  - Refer to an experienced bariatric surgeon for consultation and evaluation.

# Bariatric Surgery

- Typically covered for patients with:
  - BMI  $\geq 40$  kg/m<sup>2</sup>
  - BMI  $\geq 35$  kg/m<sup>2</sup> + obesity-related condition such as CVD, OSA, uncontrolled T2DM or severe OA

Surgery	Mechanism	Mean Weight Loss (% TBWL)	Positives
<b>Adjustable Gastric Banding</b>	Restriction	20-25%	No anatomic alteration Removable and adjustable
<b>Sleeve Gastrectomy</b>	Restriction	25-30%	Easy to perform Few long-term complications
<b>Roux-en-Y Gastric Bypass</b>	Restriction + Malabsorption	30-35%	Strong metabolic effects <5% major complications
<b>Single Anastomosis Duodeno-ileal Bypass (SADI-S)</b>	Restriction + Malabsorption	35-45%	Powerful metabolic effects Most pronounced weight loss Significant diabetes remission

# Bariatric Surgery

## Benefits

- Improved obesity-related comorbidities
  - T2DM: 77% resolve, 86% improve
  - HTN: 62% resolve, 78.5 improve
  - OSA: 85.7% resolve
- Improved quality of life
- Reduce mortality
  - 40% in overall mortality
  - 50% in CVD deaths

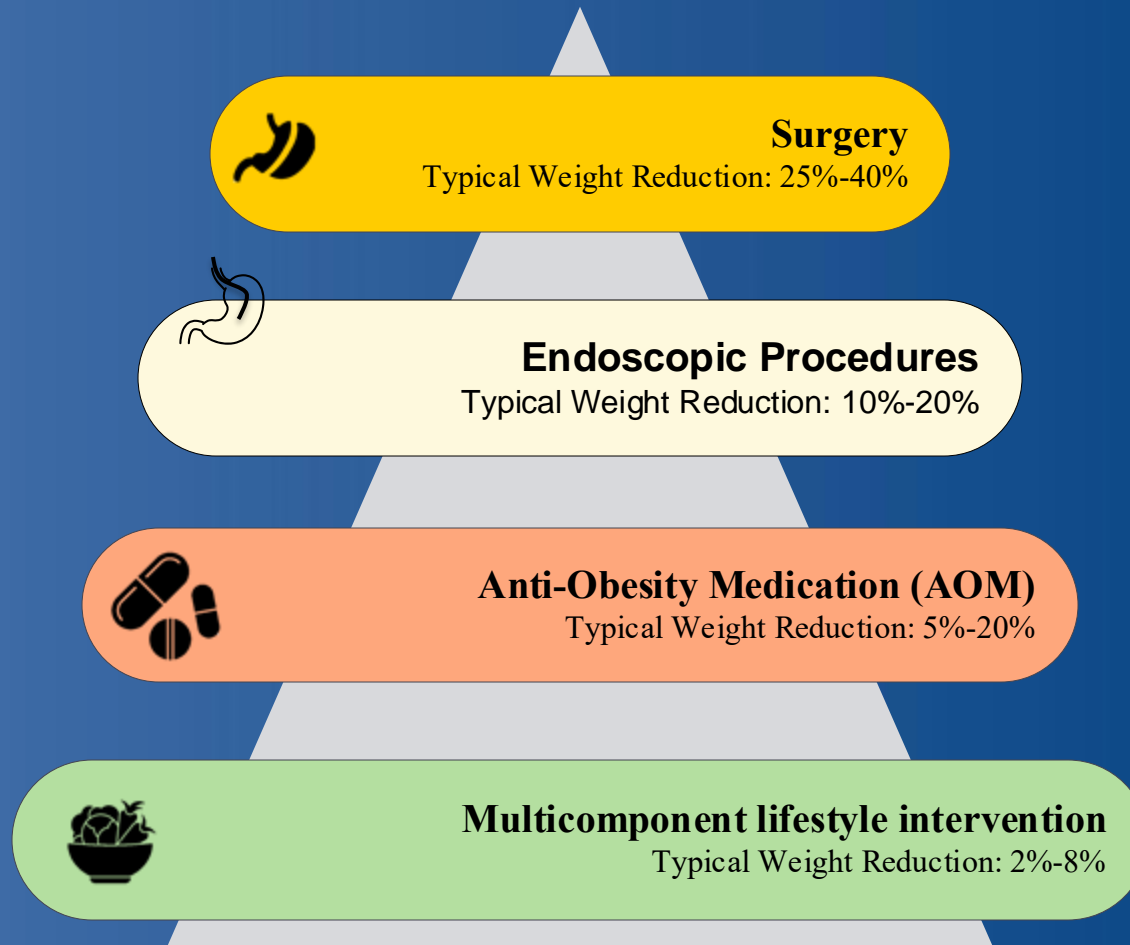
## Complications

- Risk of death from procedures low <0.1%
- Variable by procedure
  - GI symptoms 7-38%
  - Nutrition/electrolyte imbalances 3-17%
  - Reoperation 2-12%

# Bariatric Surgery

- Choice of a specific bariatric surgical procedure may be affected by:
  - Patient factors:
    - Age, severity of obesity/BMI, co-morbid conditions, other operative risk factors, risk of complications, behavioral and psychosocial factors, and patient preference
  - Provider factors:
    - Surgeon and facility
  - Insurance factors:
    - Benefits coverage and eligibility criteria

# Obesity Treatment Pyramid



**BMI  $\geq$  25 kg/m<sup>2</sup>**



## **Assess Risk Factors**

<b>BMI &amp; Risk Factor Status</b>	<b>Evidence-based Plan</b>
<b>BMI 25-26 kg/m<sup>2</sup> + RFs</b> <b>BMI 27-29 kg/m<sup>2</sup> (No RFs)</b>	<ul style="list-style-type: none"><li>• Counsel on overweight status</li><li>• <b>Encourage changes in diet, physical activity and behavior to lose weight</b></li><li>• Medication management:<ul style="list-style-type: none"><li>• <b>Assess for weight gain promoting medications</b></li></ul></li></ul>
<b>BMI <math>\geq</math>27 kg/m<sup>2</sup> + RFs</b> <b>BMI <math>\geq</math>30 kg/m<sup>2</sup> (No RFs)</b>	<ul style="list-style-type: none"><li>• Counsel on high risk weight status</li><li>• <b>Refer to high-intensity, comprehensive lifestyle change program</b></li><li>• Medication management:<ul style="list-style-type: none"><li>• <b>Consider weight loss medications as adjunct</b></li></ul></li><li>• <b>Consider minimally invasive procedure if BMI <math>\geq</math>30 kg/m<sup>2</sup> and above fails</b></li></ul>
<b>BMI <math>\geq</math>35 kg/m<sup>2</sup> + RFs</b> <b>BMI <math>\geq</math>40 kg/m<sup>2</sup> +/- RFs</b>	<ul style="list-style-type: none"><li>• Counsel on high risk weight status</li><li>• Refer to high-intensity, comprehensive lifestyle change program</li><li>• Medication management:<ul style="list-style-type: none"><li>• Assess for weight gain promoting medications</li><li>• Consider weight loss medications as adjunct</li></ul></li><li>• <b>Consider minimally invasive procedures or bariatric surgery if above fails</b></li></ul>

**THANK YOU**