

# OBESITY PANEL

Brytney Cobia, MD, ABOM

Elizabeth Fryoux, MD, ABOM, FACP

Jarrett Morgan, MD, ABOM

# LEARNING OBJECTIVES


1. Describe obesity as a serious and progressive chronic disease with an emphasis on energy imbalance and its impact on cardiometabolic health.
2. Identify obesity-related complications, comorbidities, and the benefits of weight reduction.
3. Apply evidence-based lifestyle modifications including behavioral therapies, nutritional interventions, physical activity and pharmacological management to develop personalized care plans for patients with obesity.
4. Compare the commonly used bariatric procedures available for the treatment of obesity.
5. Develop an appropriate care plan for the pre- and post-operative management of patients.

# CASE

Mrs. S presents to your clinic to discuss her weight. She has a history of HTN, for which she is on hydrochlorothiazide and metoprolol succinate. She would like to know how obesity is defined and if she is considered overweight or obese. Her vitals are BP 140/85 mmHg, Pulse 88 bpm, Weight 215 lbs, Height 5'3". What would you tell her?

# DEFINITION AND CLASSIFICATION OF OBESITY

## ENDOCRINE SOCIETY PATHOGENESIS STATEMENT, 2017



$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height (m}^2\text{)}}$$

A person with obesity is an individual with BMI  $\geq 30$  kg/m<sup>2</sup>

Classification	BMI (kg/m <sup>2</sup> )	
	International classification <sup>1</sup>	Asian population <sup>3</sup>
Underweight	<18.5	
Normal range	$\geq 18.5$ and <25	$\geq 18$ and <23
Pre-obesity*	$\geq 25$ and <30	$\geq 23$ and <25
Obesity	$\geq 30$	>25
Obesity class I	$\geq 30$ and <35	
Obesity class II	$\geq 35$ and <40	
Obesity class III	$\geq 40$	

# CLASSIFICATION OF OBESITY: WAIST CIRCUMFERENCE

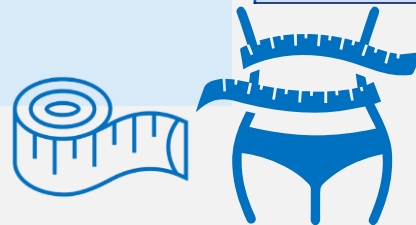
Waist circumference measures central obesity and predicts risk independent of BMI, so **measuring both BMI and waist circumference is recommended**<sup>1,2</sup>

In clinical practice, waist circumference represents visceral fat content.

An increase in waist circumference is associated with an elevated risk for insulin resistance and metabolic abnormalities, including dyslipidemia and diabetes

- This risk goes up with waist size that is **greater than 88 cm for women** or **greater than 102 cm for men\***

Classification	BMI (kg/m <sup>2</sup> )	Disease risk relative to normal weight <sup>3</sup>	
		Men ≤40 in (102 cm) Women ≤35 in (88 cm)	Men >40 in (102 cm) Women >35 in (88 cm)
Pre-obesity*	≥25 and <30	Increased	High
Obesity			
Obesity class I	≥30 and <35	High	Very high
Obesity class II	≥35 and <40	Very high	Very high
Obesity class III	≥40	Extremely high	Extremely high



# METABOLIC SYNDROME DEFINITION

## Metabolic syndrome: The NCEP ATP III definition\*

In order to make a diagnosis of the metabolic syndrome a patient must present with **three or more** of the following five risk factors:

Risk Factor	Defining Level
Abdominal obesity Men Women	Waist circumference >102 cm (>40 in) >88 cm (>35 in)
Triglycerides	≥150 mg/dL (1.7 mmol/L)
HDL cholesterol Men Women	<40 mg/dL (1.04 mmol/L) <50 mg/dL (1.29 mmol/L)
Blood pressure	≥130/ ≥85 mmHg
Fasting glucose	≥100 mg/dL (5.6 mmol/L)

\*2001, updated 2005

Although each of these is a risk factor for cardiovascular disease, when a person has three or more and is diagnosed with metabolic syndrome, the chance of developing heart disease, diabetes, stroke significantly increases.

# CASE CONTINUED

You tell her she is considered Class 2 obesity based on her BMI of 38.1. She then asks you with that diagnosis, what complications could arise?

•According to the Centers for Disease Control and Prevention (CDC), the estimated prevalence of each BMI category among US adults (aged 20 years or older) in 2018 was as follows:

1.Underweight: 1.8%

2.Normal weight: 28.0%

3.Overweight: 33.9%

4.Obese: 36.3%

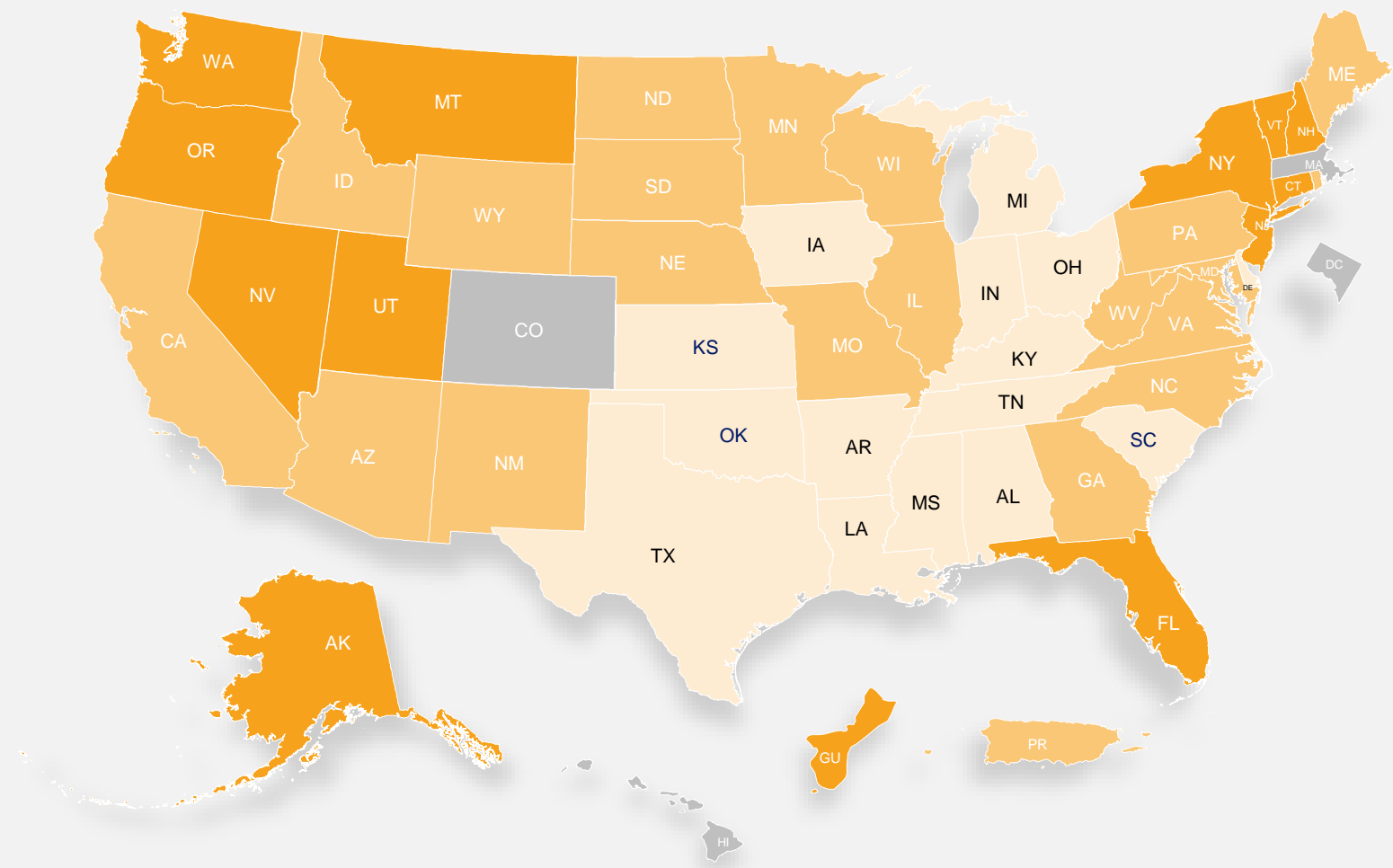
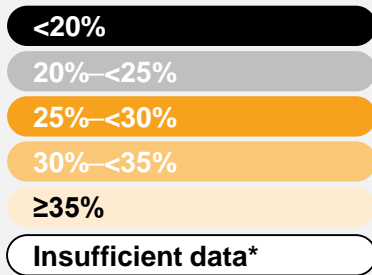
70.2%



**HOW MANY  
AMERICANS  
STRUGGLE  
WITH  
OBESITY?**



# BMI $\geq 30$ KG/M<sup>2</sup> IS PREVALENT ACROSS THE U.S., AFFECTING $\geq 20\%$ OF ADULTS IN ALL STATES



BMI, body mass index.

Centers for Disease Control. Adult Obesity Prevalence Maps, 2020. Available at: <https://www.cdc.gov/obesity/data/prevalence-maps.html>. Accessed August, 2022.

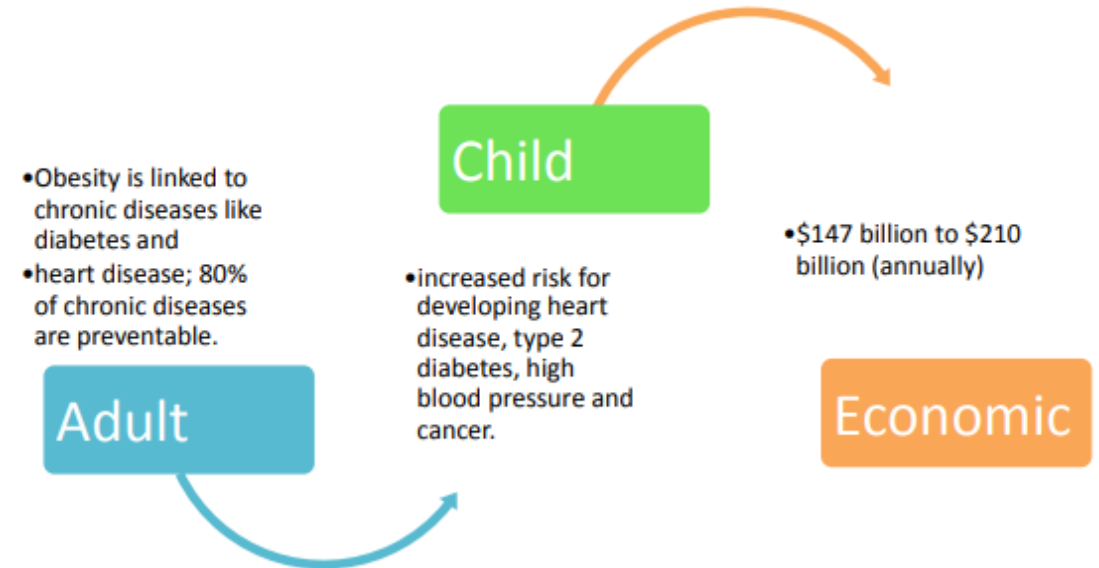
# WHY DO WE CARE IF PEOPLE ARE OBESE?

IT IS FATAL!!!!!!!!!!!!

1. WHO: 20% increase in all cause mortality
2. Meta-analysis of 19 cohort studies: 27% increase in all cause mortality
3. NHANDS: 50% higher risk of mortality in individuals with a BMI >30 compared to BMI 18.5 – 24.9

# MISSISSIPPI OBESITY STATISTICS

- MS has the second highest rate of adult obesity in the nation at 37.3%
- Mississippi's obesity rate could contribute to:
  - 415,353 new cases of type 2 diabetes
  - 814,504 new cases of coronary heart disease and stroke
  - 751,568 new cases of hypertension
  - 487,642 new cases of arthritis
  - 111,069 new cases of obesity related cancer.
- If body mass index (BMI) were lowered by 5%:
  - MS could save 6.9% in health care
  - Equates to saving \$6.12 trillion



- The number of MS residents that would be spared from developing new cases of major obesity-related diseases includes:
  - 86,347 people could be spared from type 2 diabetes
  - 66,897 from coronary heart disease and stroke
  - 56,741 from hypertension
  - 35,176 from arthritis
  - 4,795 from obesity-related cancer

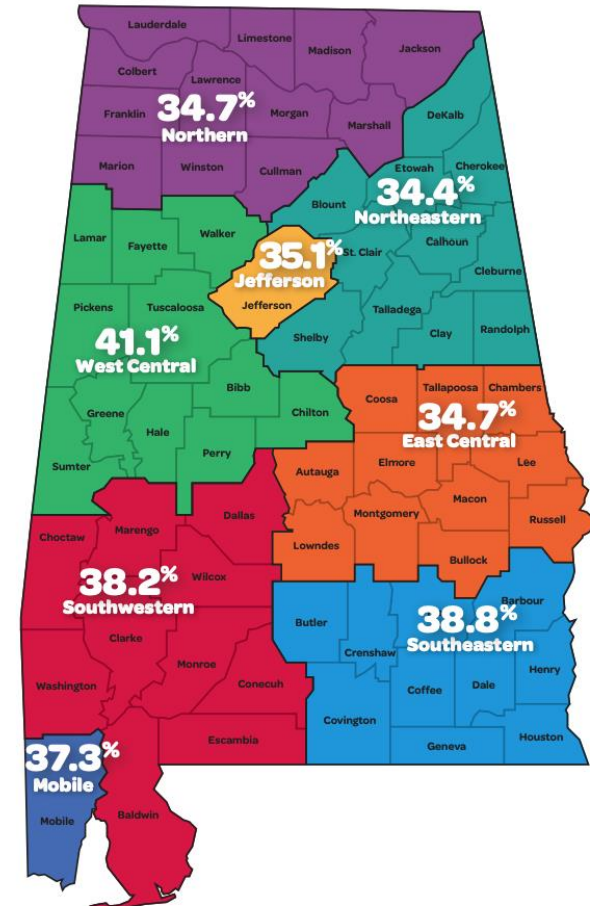
# ALABAMA OBESITY STATISTICS

- AL has the sixth highest rate of adult obesity in the nation at 35.8%
- The Alabama age-adjusted death rate rankings for obesity-related diseases are among the highest in the nation
  - 5th for heart disease
  - 7th for stroke
  - 10th for diabetes
- The estimated direct and indirect costs of obesity and being overweight in the US are \$117 billion.
- Alabama spent the equivalent of \$293 per person on its 4 million plus residents last year paying for health care costs related to obesity
  - 9<sup>th</sup> highest amount in the nation



## PERCENTAGE OF OBESITY BY PUBLIC HEALTH DISTRICTS, ALABAMA 2019

Source: 2019 Alabama Behavioral Risk Factor Surveillance System (BRFSS)



# OBESITY IS ASSOCIATED WITH MULTIPLE CO-MORBIDITIES

	GRADE	Strength of evidence
	4	Very strong
	3	Strong
	2	Moderate
	1	Weak

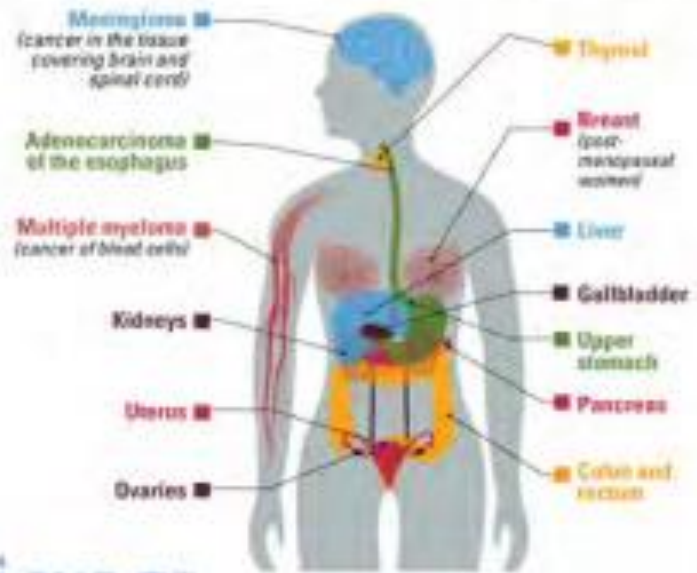


**229+**

complications affecting *EVERY* organ system and medical specialty

# OBESITY-RELATED COMORBIDITIES

13 cancers are associated with overweight and obesity



VitalSigns™

<https://www.cdc.gov/vitalsigns/obesity-cancer>

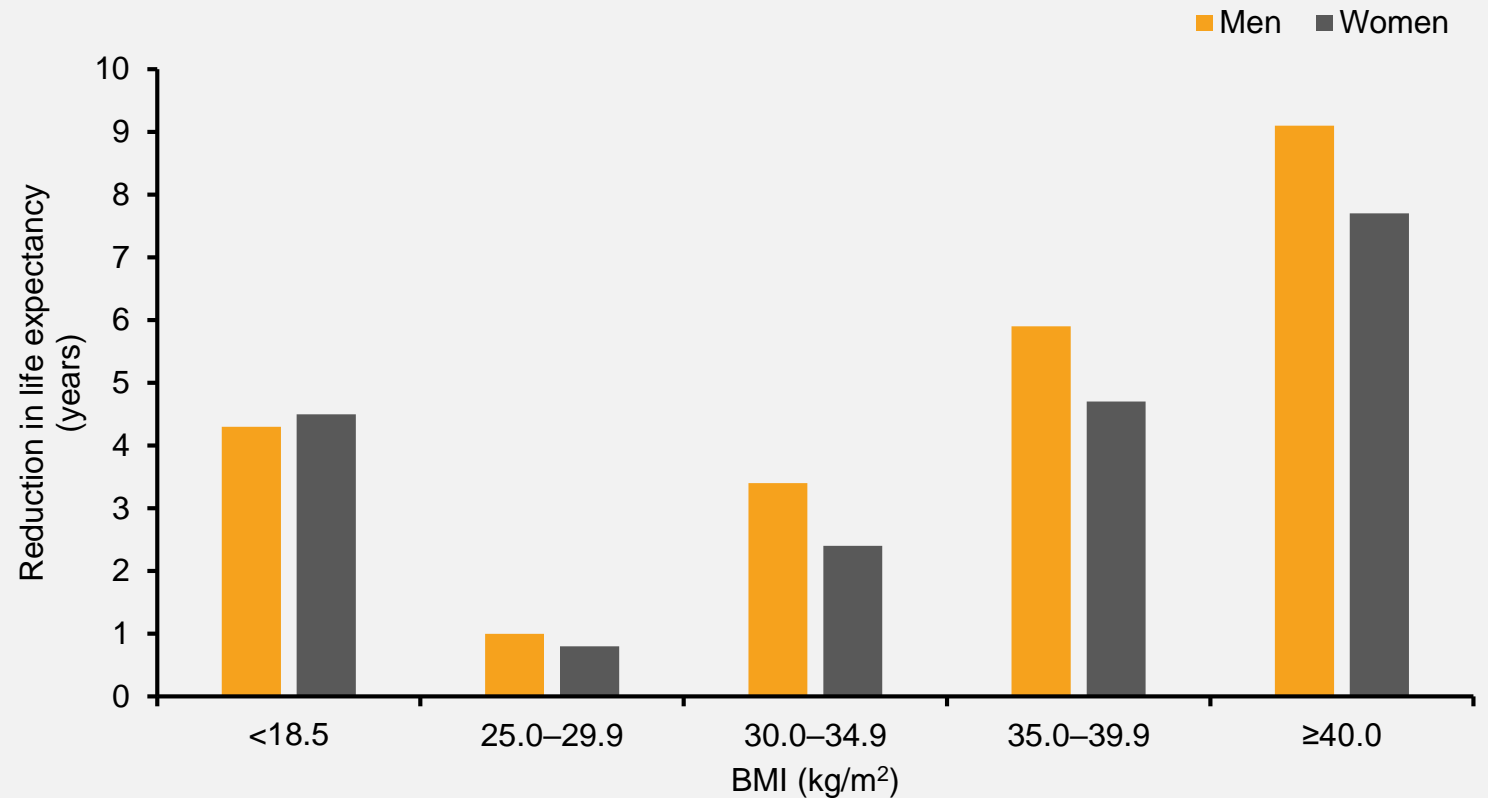


Source: Centers for Disease Control and Prevention

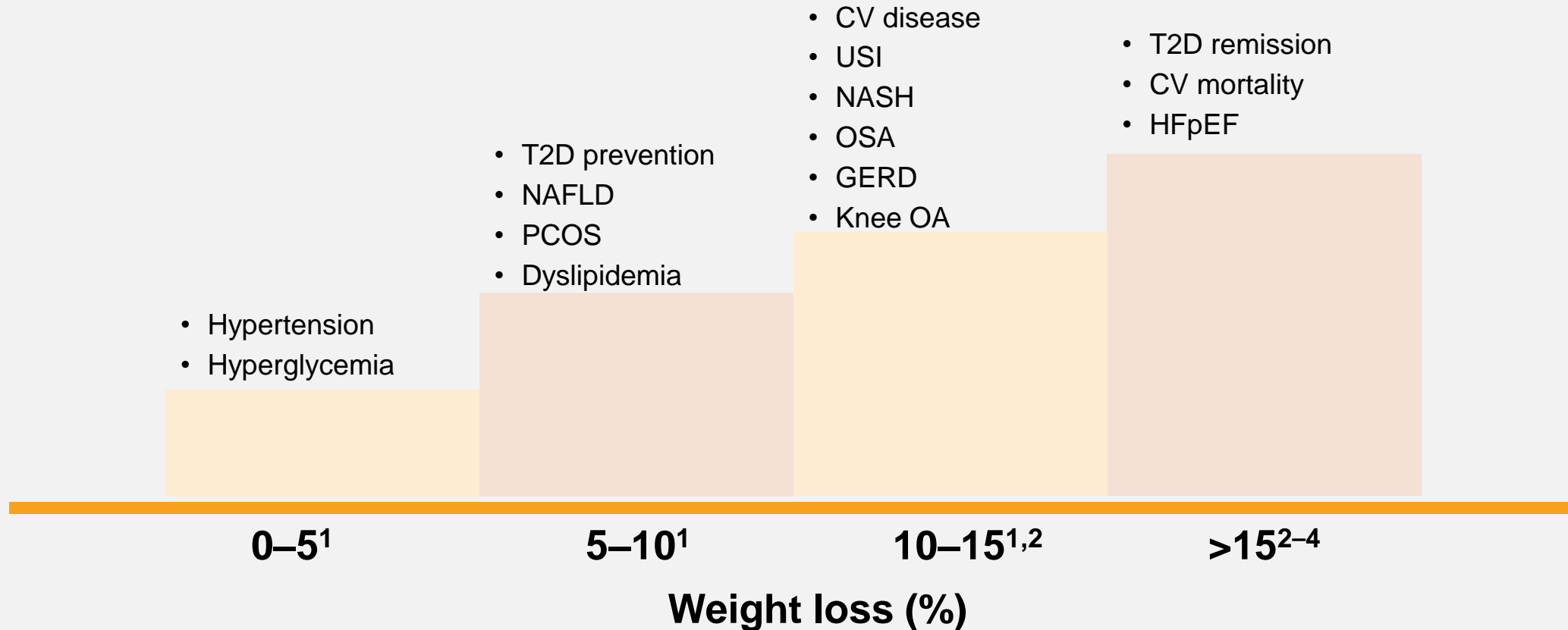
# LIFE EXPECTANCY ACROSS BMI CATEGORIES

Estimated reduction in life expectancy\* compared with an individual of healthy weight (18.5–24.9 kg/m<sup>2</sup>)  
Never-smokers, N = 1,969,648<sup>2</sup>

**30% increase in mortality** is associated with **every 5 BMI point increase** above a BMI of 25<sup>1</sup>

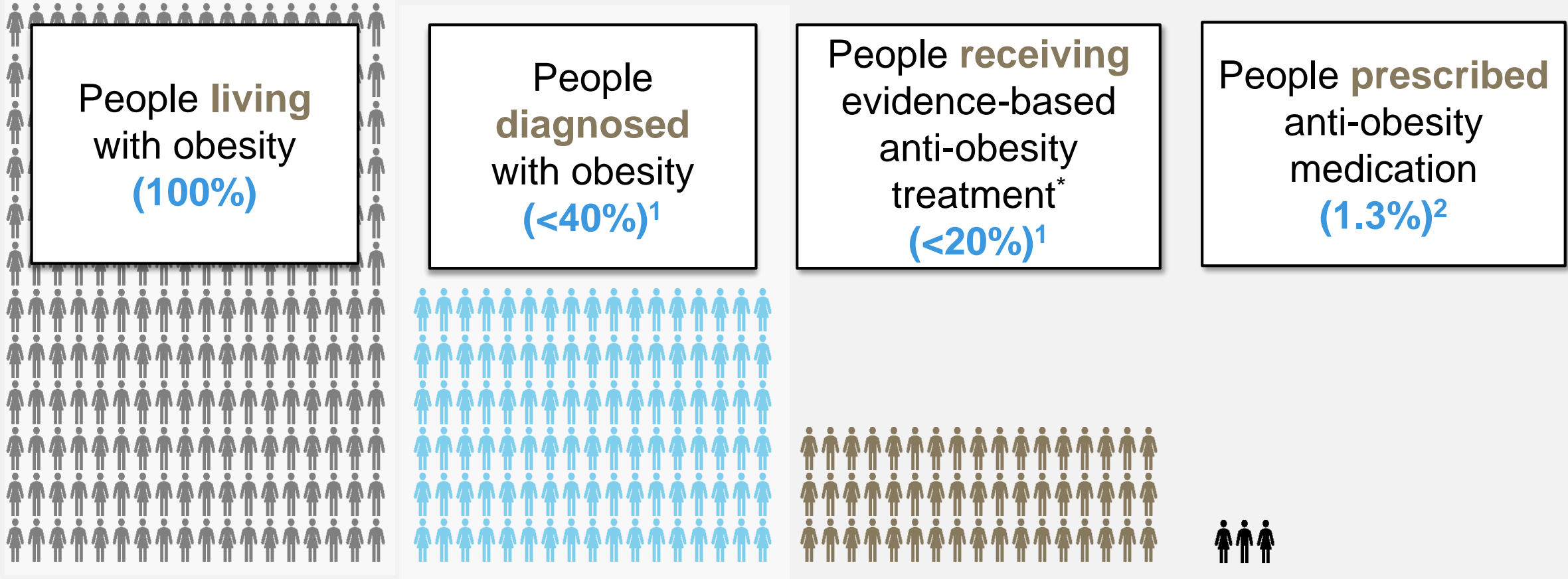


# GREATER WEIGHT LOSS IMPROVES OBESITY-RELATED COMPLICATIONS





# SIGNIFICANT UNMET NEED IN OBESITY MANAGEMENT



\*Includes lifestyle and behavioral counseling, anti-obesity medications and bariatric surgery. Adapted from: 1. Ma J et al. Obesity (Silver Spring). 2009;17:1077-85; IMS Xponent Dec-15; 2. Saxon DR et al. Obesity (Silver Spring). 2019; 27(12):1975-81.

# CASE CONTINUED

Mrs. S is now very concerned that she caused this and is worried about other providers treating her differently. How would you respond?

# OBESITY: A MULTIFACTORIAL DISORDER



**Genetics**



**Environment**



**Development**



**Behavior**



## **THE OBESITY MEDICINE ASSOCIATION'S DEFINITION OF OBESITY**

“Obesity is defined as a chronic, progressive, relapsing, and treatable multi-factorial, 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.”

# CAUSES OF OBESITY

Overeating

Sedentary  
lifestyle

Genetics

Medical  
conditions

Medications

Stress

Sleep  
deprivation

Environmental  
factors

# OVEREATING

## Dietary Guidelines for Americans:

- Women: 1600 calories/day to maintain weight
- Men: 2000 calories/day to maintain weight

## National Health and Nutrition Examination Survey (NHANES)

- Average intake for women: 1800 – 2300 calories/day
- Average intake for men: 2500 – 2700 calories/day

ONE POUND = 3500 CALORIES

- Women:
  - 1lb every 7.7 days
- Men:
  - 1lb every 5.8 days

# GENETICS

- Monogenic obesity: This is a rare form of obesity caused by mutations in a single gene, leading to severe obesity from a young age. Examples of monogenic obesity include Prader-Willi syndrome and Bardet-Biedl syndrome.
- Polygenic obesity: This is a more common form of obesity caused by the combined effects of many genes, each contributing a small amount to an individual's overall risk of obesity.
  - Genes associated with obesity include: MC4R, LEPR, FTO, POMC, SH2B1, BDNF, GAD2, NEGR1, KSR2, TNF

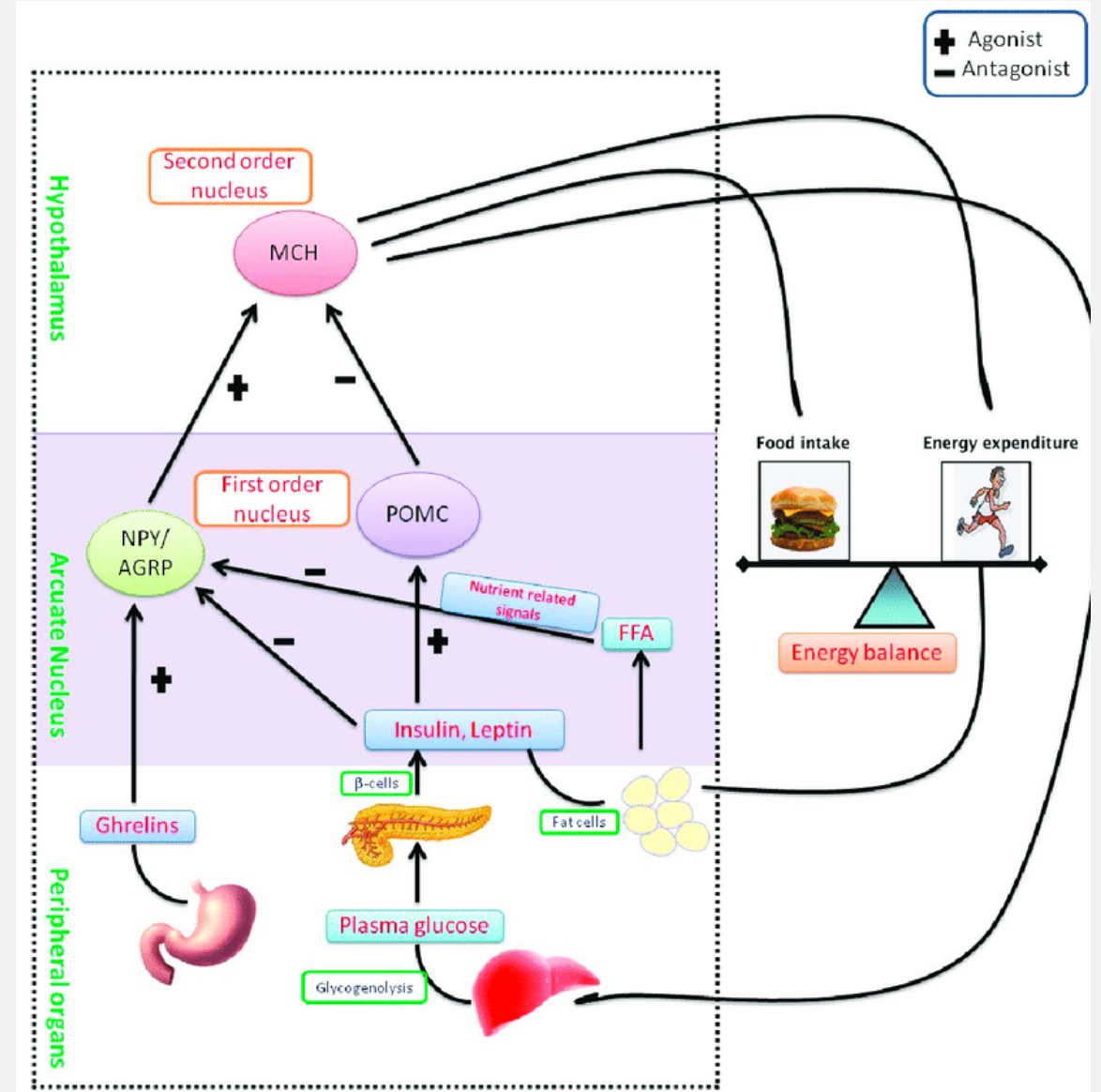
# MEDICAL CONDITIONS

1. Hypothyroidism
2. Polycystic ovary syndrome (PCOS)
3. Cushing's syndrome
4. Sleep apnea
5. Depression and other mental health disorders
6. Hypothalamic aberrancies
  - Menopause
  - Low testosterone levels



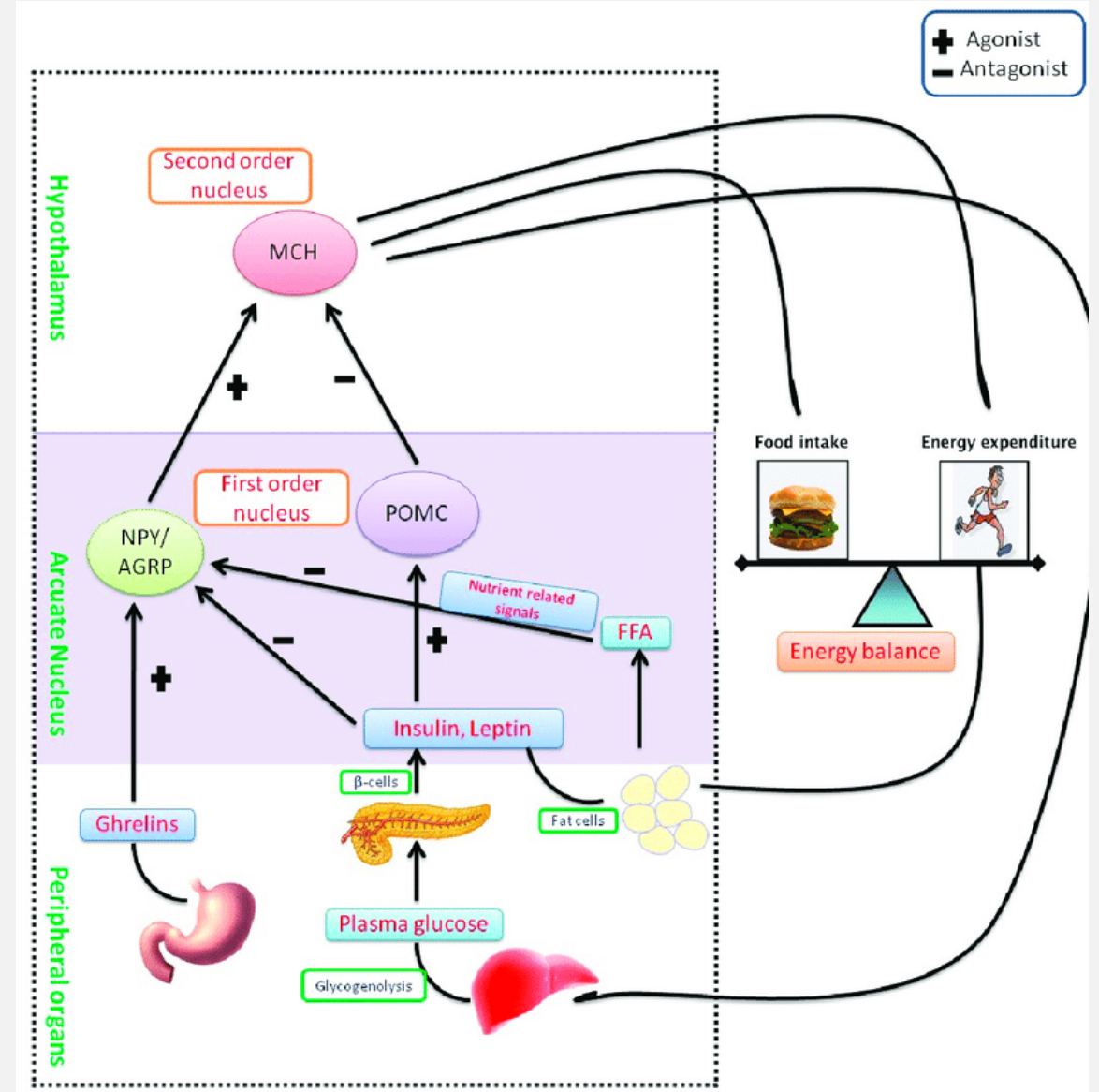
# PATHOPHYSIOLOGY OF OBESITY

- Leptin – ghrelin dysregulation
- Leptin resistance
- Increased sensitivity to ghrelin
- Insulin resistance
- Adipose tissue dysfunction – adipokines
- Stress – cortisol
- Gut microbiome – stool transplants
- Sleep deprivation – POMC – melatonin
- Dopamine pathway dysregulation



# PATHOPHYSIOLOGY OF OBESITY

- Hypothalamus and the “set point”
- If an individual loses weight, the hypothalamus will increase appetite and decrease energy expenditure to promote weight gain and restore the set point.



# THE DISEASE OF OBESITY

Energy dysregulation → Excess caloric intake → Excess adiposity → High BMI

## Biological signals affecting energy balance:

- Adipose tissue
- Stomach & intestines
- Pancreas

## Other factors affecting energy balance:

- Medications
- Hedonic input
- Genetics
- Environment



## Energy expenditure

- Physical activity
- Basal metabolism
- Adaptive thermogenesis



## Energy intake

- Behavior
- Food availability
- Hunger and satiety
- Hormonal and neuronal appetite signaling

Obesity results from inappropriate energy intake cues (hormones and signals) driven by genetic predisposition to an obesogenic environment

# WHAT IS OBESITY BIAS?

- Obesity bias in medicine refers to the negative attitudes and assumptions that healthcare providers have towards individuals who are overweight or obese.
- This bias can manifest in a number of ways, such as assuming that the patient's health problems are solely caused by their weight, or attributing their symptoms to their weight without further investigation.



# DISCUSSION

- **Weight Stigma and Bias**

- Inferior healthcare when compared to those of normal weight
- Inhibition in seeking medical care

## WEIGHT BIAS AND STIGMA IMPACT OUR CULTURE

### MEDIA

72% OF MEDIA IMAGES AND 65% OF VIDEOS STIGMATIZE INDIVIDUALS WITH OBESITY.



### WORKPLACE

IN ONE STUDY, 43% OF PARTICIPANTS EXPERIENCED PREJUDICE FROM EMPLOYERS AND 54% EXPERIENCED PREJUDICE FROM CO-WORKERS.



### HEALTHCARE

IN ONE STUDY, 33% OF PHYSICIANS REPORTED RESPONDING NEGATIVELY TO PATIENTS WITH OBESITY. IN MANY MEDICAL OFFICES, PATIENTS WITH OBESITY OFTEN LACK ACCESS TO APPROPRIATELY-SIZED FURNITURE, GOWNS AND MEDICAL DEVICES.

[www.ObesityCareWeek.org](http://www.ObesityCareWeek.org)



# THE MEDIA HAS MADE THIS CONFUSING

- Body positivity movement
- Fat shaming
- Shaming celebrities who lose weight
- Misinformation surrounding new obesity management medications

“Warning that Ozempic and Mounjaro can trigger accelerating aging”



# COMMUNICATION

## Avoid stigmatizing or blaming words

Avoid using words that are perceived negatively when talking to and about patients and replace them with other terms

- ✗ Obese
- ✗ Morbidly obese
- ✗ Fat
- ✓ Unhealthy weight
- ✓ High body mass index

## Use patient-first language

Allows the patient to be distinguished from their weight. Remember that people are not their disease when discussing obesity

- ✗ Obese
- ✓ Patients with obesity
- ✓ Patients affected by obesity



# HOW DO WE TALK TO PATIENTS ABOUT OBESITY?

- Don't ignore it!
- Patients with obesity know they are obese
- “I was reviewing your chart and noticed your BMI is in a higher category, which means your weight is above the average for your height. Has anyone ever talked to you about that?”
- You may get a hard NO. But you may not!



# HOW DO WE TALK TO PATIENTS ABOUT OBESITY?

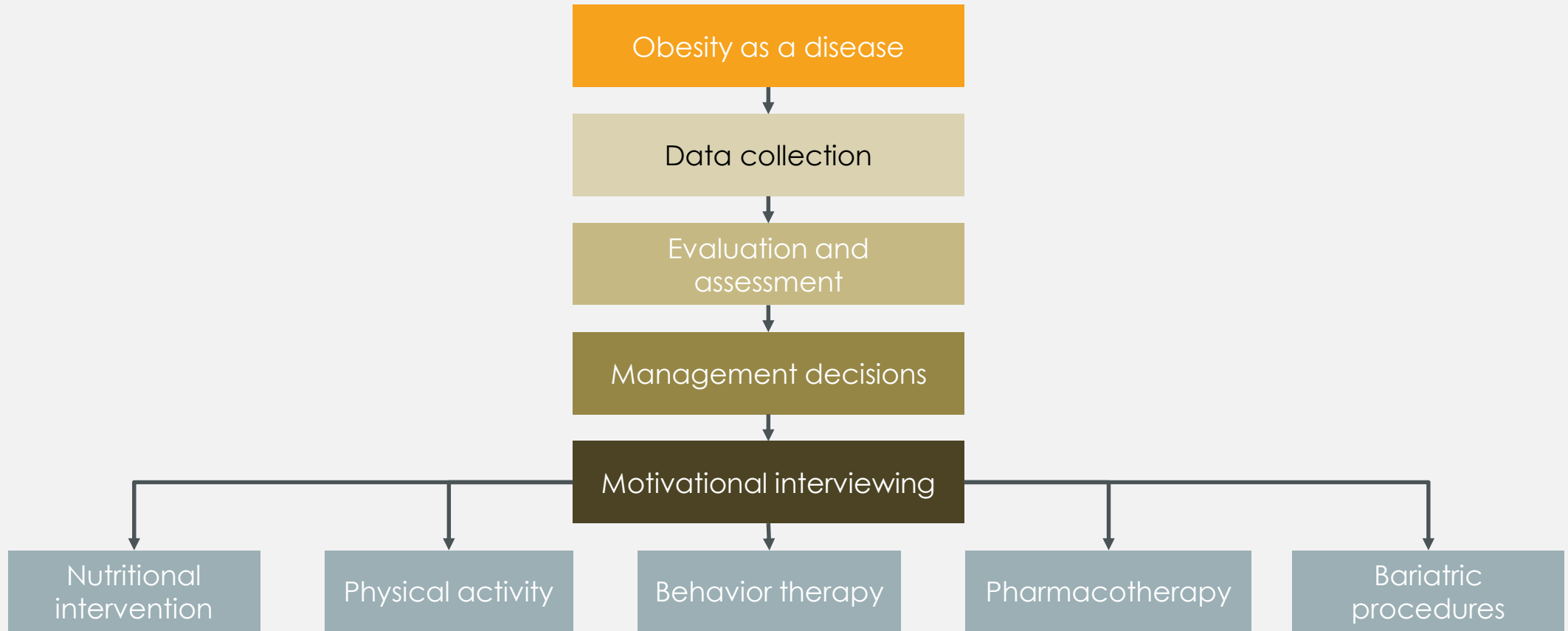
- REMOVE THE BLAME
- “Weight management is extremely complex. It is not your fault. You are not alone.”
- “Does anyone else in your family struggle with their weight?”
  - There is a large genetic component
- “Have there been times in your life where you have noticed your weight increases such as times of stress or hormonal fluctuations?”
  - External variables contribute greatly to weight

# CASE CONTINUED

She would like to know best nutrition plans for her given her history of HTN and what she can do for physical activity. She also asks if stress and her poor sleep are contributing? What do you tell her?

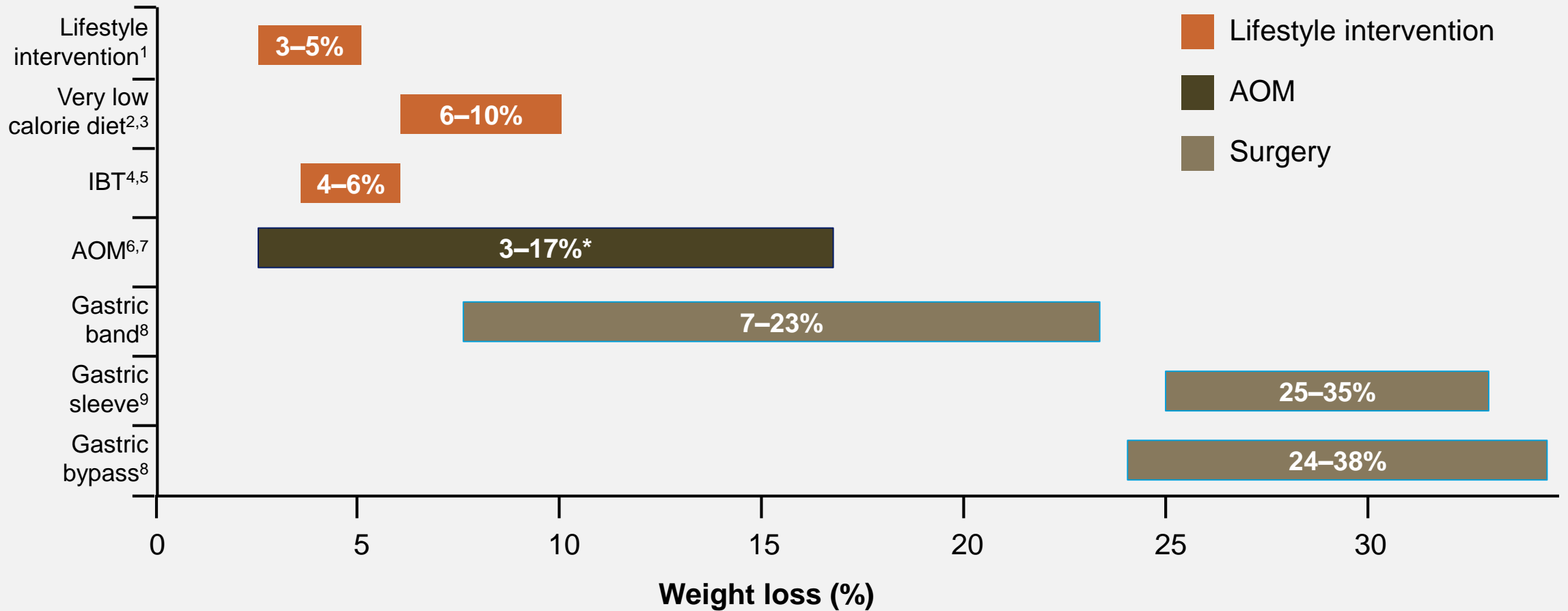
# PRINCIPLES OF CARE

## SUGGESTIONS FROM THE OBESITY MEDICINE ASSOCIATION



# HOW CAN OBESITY BE ADDRESSED?

## EFFICACY OF EXISTING WEIGHT LOSS INTERVENTIONS



<b>Name of Diet</b>	<b>Type</b>	<b>Specific Recommendation</b>	<b>Notes</b>
<b>Atkins</b>	Low Carbohydrate	Emphasizes protein consumption and significant reduction in carbohydrate intake	Low-carbohydrate diets tend to increase HDL and decrease triglycerides
<b>Low GI</b>	Low Glycemic Index	Promotes eating foods with reduced glycemic load	May result in better weight loss outcomes among people with insulin resistance
<b>Mediterranean</b>	Balanced	Emphasizes fruits, vegetables, lean proteins, plant-based fats, and limited intake of foods with added sugars or animal-based fats	Leads to improved blood pressure, lipids, and glycemic control
<b>Ornish</b>	Low Fat	Promotes fat restriction to <10% of daily intake	May decrease LDL
<b>South Beach</b>	Low Carbohydrate	Promotes higher protein and lower carbohydrate intake, but emphasizes lean proteins (lower fat)	
<b>Zone</b>	Balanced	Promotes a carbohydrates/proteins/fats ratio of 40:30:30	
<b>DASH</b>	Low salt, balanced	Promotes foods low in saturated and trans fats, rich in potassium, calcium, magnesium, fiber, and protein and low in sodium	It is an effective dietary intervention to reduce blood pressure and cholesterol

# NUTRITION CONT'D

## KETO DIET

- Intentional restriction of dietary carbohydrates and switching to fat-derived ketones, rather than glucose, for energy.
- Carbohydrates are limited to 5–10% of calories (< 20–50 g/day), proteins to 25% of calories (1–1.5 g/kg/day), and fat until satiated.
- Associated with improved A1c and fasting glucose; however lipid profile is equivocal

## INTERMITTENT FASTING

- An alternative approach to the traditional calorie-restricted diet, whereby individuals alternate between prolonged fasting (16-48 hours) and normal food consumption within a specified time window.
- Compared to calorie restriction – same

lose weight with the

SOUTHERN  
Remedy

HEALTHY EATING PLATE

One selection from each of the sections of the plate for breakfast, lunch and dinner plus 2 snacks provides about 1,400 calories per day.  
Adjust calories up as needed to lose only the recommended 1-2 pounds per week.

## Fruit

- 17 grapes
- 1/2 banana
- 1 1/4 cup whole strawberries
- 3/4 cup pineapple
- 1 1/4 cup watermelon
- 3/4 cup blueberries
- small apple
- small peach
- 4 oz fruit juice
- 2 tbsp raisins
- 1/4 cup dried fruit

## Vegetable

1/2 cup servings

- green beans
- broccoli
- asparagus
- tomato
- okra
- squash
- zucchini
- carrots
- lettuce
- cucumbers
- turnip greens
- cabbage

## Whole Grain/ Starchy Vegetable

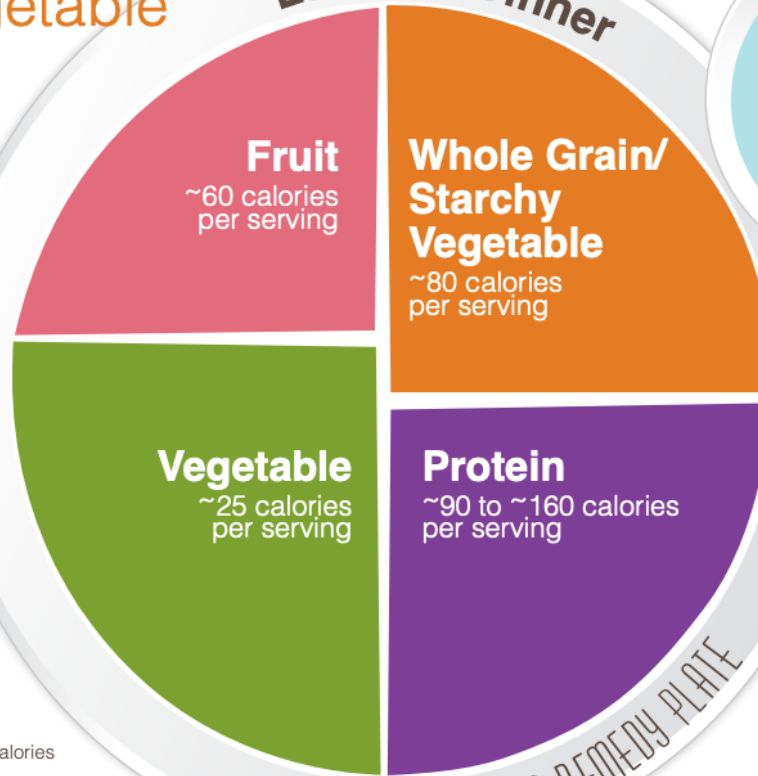
- 1/3 cup cooked rice
- 1/3 cup cooked pasta
- 1 slice of bread
- 1/2 cup sweet potatoes
- 1 small baked potato
- 1/2 cup corn
- 1/2 cup English peas
- 1/2 cup beans (pinto or kidney)
- 1 low carb tortilla

## Protein

3 oz serving of meat  
size of a deck of cards

- pork tenderloin - 40 calories/oz
- boneless, skinless chicken breast - 30 calories/oz
- sirloin - 50 calories/oz
- flank steak - 40 calories/oz
- grilled fish - 40 calories/oz
- shrimp - 25 calories/oz
- 1/4 cup mixed nuts - 160 calories
- 1 tbsp peanut butter - 80 calories
- 1 cup edamame (soy) beans - 115 calories

## Lunch & Dinner



## Dairy

~80 Calories per serving  
low fat or fat free

- 1 oz cheese (size of 2 dominoes)
- 1/4 cup cottage cheese
- 1 cup milk
- 4 - 6 oz yogurt

- 2 oz= 1/4 cup
- 3 oz= 1/3 cup
- 4 oz= 1/2 cup
- 5 oz= 2/3 cup
- 6 oz= 3/4 cup
- 8 oz= 1 cup

## Snacks

~120 calories

A combo of a carb and protein is a good choice.

- 1/2 cup carrots & 1/4 cup hummus
- 6 crackers & 1 oz low fat cheese
- apple & 1 tbsp peanut butter
- 17 grapes & 1 oz low fat cheese
- small serving of cereal and milk
- 2 tbsp raisins & 1 oz almonds
- 4 - 6 oz Greek yogurt (0% fat) & 1/2 cup fruit
- 1/2 cup light ice cream
- 1/2 oz almonds

## Beverages

0 calories - unsweetened

- tea
- water
- coffee
- diet soda

An Original Production of



~ approximately equal to.

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# NUTRITION

- It is important to focus on **quantity** as well as **quality** of dietary intake.
- Dietary adherence is the key to weight loss success.
- Self monitoring with a food journal has also been proven to help with adherence, behavior change and accountability.
- With lifestyle intervention, patients are typically expected to lose 1-2 pounds per week, though individual responses could be variable.
- An initial weight loss goal of 5% is expected to be achieved in 6-8 months.



# RECOMMENDATIONS FOR PHYSICAL ACTIVITY

**Be active**

at least **150** minutes moderate intensity per week  
increased breathing able to talk

**OR**

at least **75** minutes vigorous intensity per week  
breathing fast difficulty talking

or a combination of both

**Build strength**  
to keep muscles, bones and joints strong

on at least **2** days a week

Swim, Brisk walk, Cycle, Gym, Carry heavy bags, Run, Stairs, Sport, Yoga, Bowls, Tai Chi, Dance

**Minimise sedentary time**  
Break up periods of inactivity

**Improve balance**  
For older adults, to reduce the chance of frailty and falls  
2 days a week

## **HIGH RISK OR UNABLE**

- AHA recommends screening all patients with a history of cardiovascular disease or who are at high risk of a heart attack or stroke before they start a vigorous exercise program.
- High risk patients can be referred for cardiopulmonary rehabilitation or physical therapy programs for structured teaching.
- Patients with limited mobility may require specialized exercise programs, such as, including water aerobics, chair exercises and walking programs.

# THE FITNESS FORMULA

- Frequency
- Intensity
- Time
- Type
- Enjoyment

- **Frequency**
  - Five times a week
- **Intensity**
  - Moderate (50-70% target HR)
- **Time**
  - 30 minutes
- **Type**
  - Walking
- **Enjoyment**
  - With a friend or listening to a podcast

# MOTIVATIONAL INTERVIEWING AND GOAL-SETTING ARE EFFECTIVE STRATEGIES TO PROMOTE WEIGHT LOSS

Individuals must have their own internal motivation for change to happen and for it to stick

**Motivational interviewing** is a collaborative, patient-centered form of guiding that is used to elicit and strengthen motivation for change

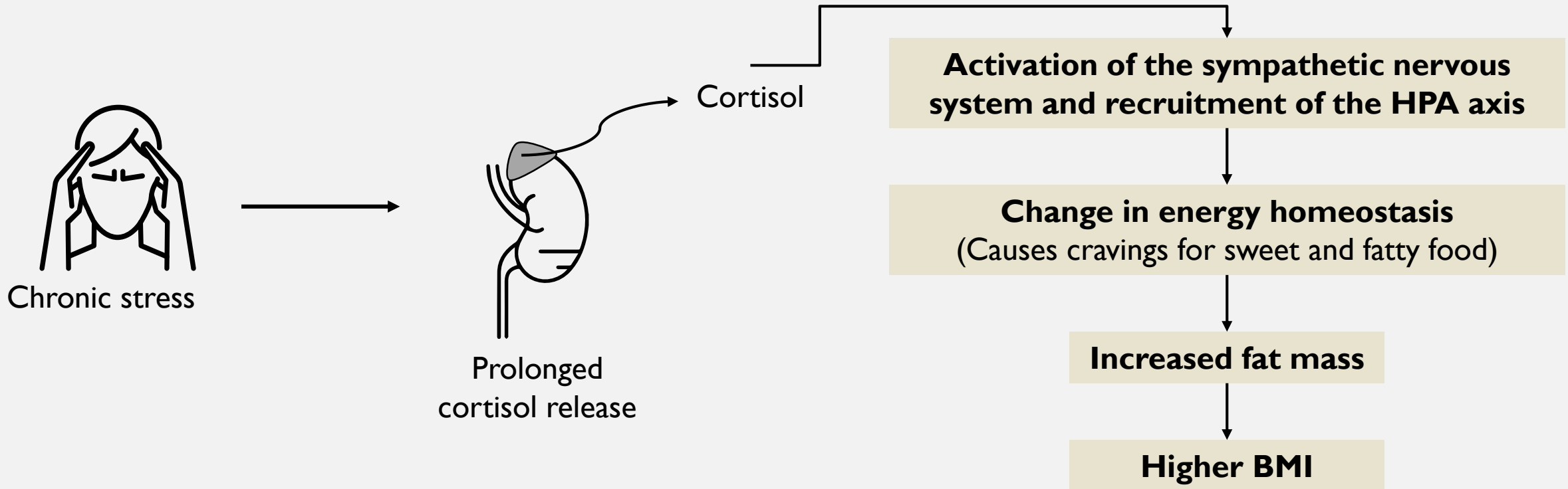
## 5 As of obesity management for adults:

- **ASK** for permission to discuss weight and explore readiness
- **ASSESS** obesity related risks and 'root causes' of obesity
- **ADVISE** on health risks and treatment options
- **AGREE** on health outcomes and behavioral goals
- **ASSIST** in accessing appropriate resources and providers

## Help people with obesity set SMART goals:

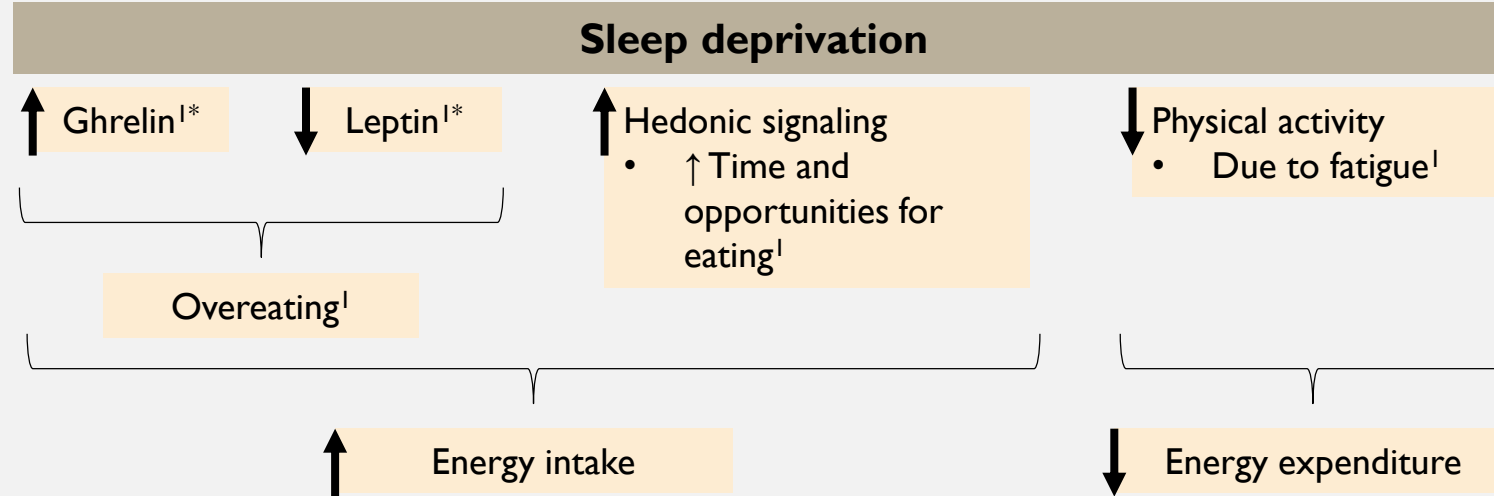
- **S**pecific
- **M**easurable
- **A**ttainable
- **R**elevant
- **T**ime-bound

# STRESS AND OBESITY



# SLEEP HYGIENE AND STRESS MANAGEMENT

Insufficient sleep is independently associated with a higher risk of obesity, and obesity may lead to reduced sleep quality<sup>1,2</sup>



Sleep extension may mitigate the risk of obesity.<sup>2</sup> How to improve and maintain sleep duration:<sup>3</sup>

Avoid caffeine and alcohol in the evening; avoid nicotine

Establish regular bed- and wake-times

Minimize stress to avoid pre-sleep arousal

- Engage in relaxing activities
- Mindfulness meditation

Exercise regularly

Restrict use of electronic devices near bedtime

# CASE CONTINUED

You schedule a 3-6 month follow up with Mrs. S. She has been keeping a food journal, focusing on whole foods and less processed foods and started walking three times a week for 30 minutes. She has lost 10 lbs (~5%), BMI now 36.3. She would like to know if she qualifies for anti-obesity medication?

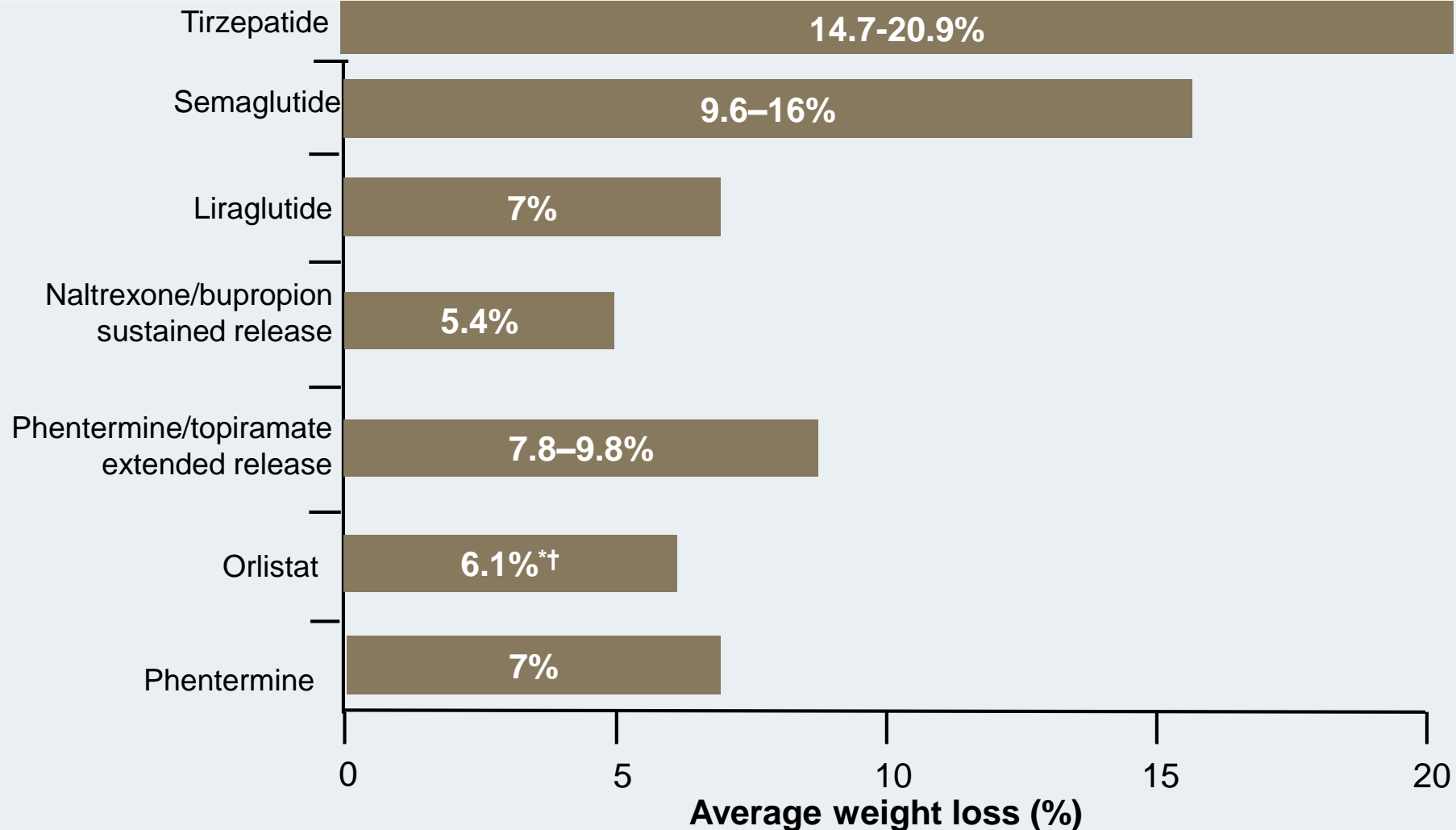
Medication type	Weight gain	Weight neutral/less weight gain	Weight loss
<b>Antidiabetics</b>	Insulin, Meglitinides, Sulfonylureas, Thiazolidinediones	$\alpha$ -glucosidase inhibitors, bromocriptine, colessevelam, DPP-4 inhibitors	GLP-1 agonists, metformin, pramlintide, SGLT2 inhibitors
<b>Antihypertensives</b>	$\alpha$ -adrenergic blockers $\beta$ -adrenergic blockers (atenolol, metoprolol, nadolol, propranolol)	ACE inhibitors, ARBs, $\beta$ -adrenergic blockers (carvedilol, nebivolol), calcium channel blockers (amlodipine, diltiazem), thiazides	
<b>Antidepressants</b>	Lithium, MAOIs, mirtazapine, SSRIs (paroxetine), tricyclic antidepressants (amitriptyline, doxepin, imipramine, nortriptyline)	SSRIs (fluoxetine, sertraline)	Bupropion
<b>Antipsychotics</b>	Clozapine, olanzapine, quetiapine, risperidone	Aripiprazole, lurasidone, ziprasidone	
<b>Anti-epileptics</b>	Carbamazepine, gabapentin, pregabalin, valproic acid	Lamotrigine, levetiracetam, phenytoin	Topiramate, zonisamide
<b>Contraceptives</b>	Medroxyprogesterone acetate	Barrier methods, intrauterine device, surgical sterilization (hysteroscopic sterilization, tubal ligation)	
<b>Antihistamines</b>	First-generation antihistamines	Second- and third-generation antihistamines	
<b>Anti-inflammatories</b>	Glucocorticoids	Inhaled steroids, topical steroids, NSAIDs, DMARDs	



# WHO QUALIFIES FOR PHARMACOTHERAPY

- Patients with a BMI of 30 kg/m<sup>2</sup> or greater
- Patients with a BMI of 27 to 29.9 kg/m<sup>2</sup> with at least one obesity-related comorbid condition (OSA, HTN, T2DM, OA, etc).
- You can expect about 5-10% of total body weight loss with most monotherapy (excluding newer medications) with nutrition, physical activity and behavioral modification.
- No matter which agent is used, **weight is often regained after cessation of medication**

# CURRENT PHARMACOTHERAPY: OVERVIEW



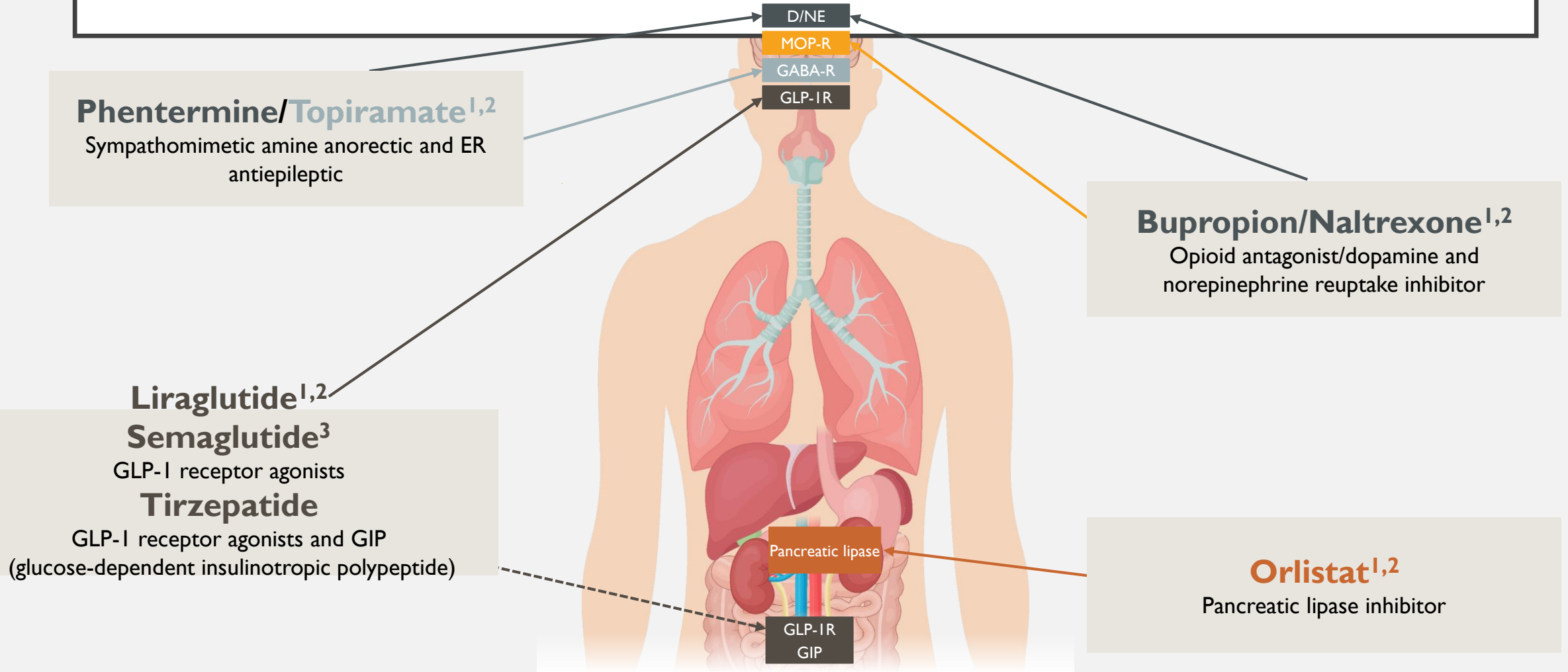
The data supporting these tables are derived from the Prescribing Information labeling approved by the U.S. Food and Drug Administration.

\*Data from randomized controlled trials >52 weeks in duration; †Assuming the average patient in the orlistat and placebo groups weighed 100 kg at baseline.

Adapted from Bray GA et al. Lancet 2016;387:1947-56. Additional references in slide notes.

# APPROVED ANTI-OBESITY MEDICATIONS

## SITES OF ACTION



D/NE, dopamine/norepinephrine; ER, extended release; GABA-R, gamma-aminobutyric acid receptor; GLP-IR, glucagon-like peptide-1 receptor; MOP-R,  $\mu$ -opioid peptide receptor.  
 1. Srivastava G and Apovian CM. Nat Rev 2018;14:12-24; 2. Patel D. Metabolism 2015;64:1376-85; 3. FDA. FDA approves new drug treatment for chronic weight management. Available at: <https://www.fda.gov/news-events/press-announcements/fda-approves-new-drug-treatment-chronic-weight-management-first-2014>. Accessed September 2022.

# PHENTERMINE (ADIPEX)

Phentermine is indicated for short-term use only (commonly understood as 12 consecutive weeks)

- Sympathomimetic amine anorectic
- Rate of weight loss is greatest in the first weeks of therapy for both drug and placebo
- Tends to decrease in succeeding weeks

**Warning and precautions:**  
Risk of abuse and dependence

**Adverse events  
(like excess catecholamines):**  
Overstimulation, palpitations, insomnia,  
hypertension and tachycardia

# PHENTERMINE-TOPIRAMATE (QSYMIA)

Approved for chronic use

- Sympathomimetic amine anorectic and ER antiepileptic
- Appetite suppressant and aid with snacking. Usually well tolerated, ~7-10% weight loss.
- Good for patients with migraines; \$100 on mail order

**Warning and precautions:**  
Can cause birth defects

**Adverse events**  
Metabolic taste, paresthesia, acute angle  
glaucoma, constipation, dry mouth

# NALTREXONE-BUPROPION (CONTRAVE)

Approved for chronic use

- Opioid antagonist/dopamine and norepinephrine reuptake inhibitor
- Good for patients with cravings; 5-7% weight loss.
- Not as well tolerated; \$100 on mail order

## **Warning and precautions:**

Seizure disorder, uncontrolled HTN

## **Adverse events**

Headaches, nausea, constipation

# LIRAGLUTIDE, SEMAGLUTIDE, TIRZEPATIDE (SAXENDA, WEGOVY, ZEPBOUND)

Approved for chronic use

- GLP1 receptor agonist; +GIP (tirzepatide)
- Slows gastric emptying and satiety (“food noise”)
- Coverage varies; 10-20% weight loss

## **Warning and precautions:**

Medullary thyroid cancer, pancreatitis

## **Adverse events**

Nausea, vomiting, heartburn, gallbladder disease

# BINGE EATING

- At least 3 of the following
  - Eating more rapidly than normal
  - Eating until feeling uncomfortably full
  - Eating large amounts of food when not feeling physically hungry
  - Eating alone because of embarrassment
  - Feeling disgusted/guilty with oneself
- Marked distress following a binge
- At least once a week for 3 months
- No compensatory measurements
- In 2015, the FDA approved lisdexamfetamine (Vyvanse) to treat binge eating disorder.



# CASE CONTINUED

Mrs. S states her best friend has bariatric surgery and has done very well. Does she qualify for that and if so, what are those options?

# CANDIDATES FOR BARIATRIC SURGERY

Indications to undergo bariatric surgery	Relative Contraindications
Not responding to past weight loss attempts	Severe heart failure
BMI is $\geq 40$ kg/m <sup>2</sup>	Unstable CAD
<b>OR</b>	End-stage lung disease
BMI is $>35$ and 1 or more severe weight-related comorbidities, such as T2DM, hypertension, sleep apnea, NAFLD, OA, or GI disorders	Active cancer treatment
	Portal hypertension
	Drug/alcohol dependency

# METABOLIC SURGERY IS THE MOST EFFECTIVE INTERVENTION FOR SEVERE OBESITY

After metabolic surgery, patients may achieve:

Reduction in overall mortality<sup>1,2</sup>

Decreased CVD risk factors and incidence of CVD<sup>2</sup>

Remission of albuminuria and early-stage CKD<sup>4</sup>

Durable weight loss (>15% weight loss for ≥10 years)<sup>2</sup>

Delay/prevention of type 2 diabetes and reduced need for antihyperglycemic medicine<sup>2,3</sup>

Decreased risk of hormone-related cancer development.

Among patients with NASH and obesity, bariatric surgery, compared with nonsurgical management, was associated with a significantly lower risk of incident major adverse liver outcomes and MACE<sup>6</sup>

Comparatively, patients lost more weight with RYGB than with SG and AGB. However, RYGB has the highest 30-day rate of major adverse events<sup>7</sup>

# PRE-OPERATIVE MANAGEMENT

**Screening for active mental illness<sup>1</sup>**

**Screening for obstructive sleep apnea and GERD<sup>1</sup>**

**Evaluation for cardiovascular risks<sup>1</sup>**



**Consideration of risks for deep vein thrombosis/venous thromboembolism<sup>1</sup>**

**Micronutrient deficiencies<sup>1,2</sup>**

- Common micronutrients to monitor<sup>2</sup>:

- Vitamin D
- Folate
- Vitamin B12
- Iron

**The preoperative evaluation should be holistic, integral, and include an assessment by an interprofessional team<sup>1</sup>**

# VERTICAL SLEEVE GASTRECTOMY (VSG)

A laparoscopic longitudinal resection of 75–80% of the stomach to an ideal size of 150 mL (permanent)<sup>1</sup>

Ideal postoperative size preserves the stomach vagal innervation<sup>1</sup>

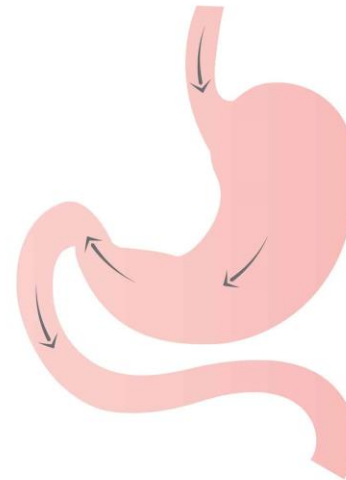
Reduces food and calorie intake<sup>1,2</sup>

Favorable changes in gut hormones involved in hunger, satiety and blood glucose control<sup>2</sup>

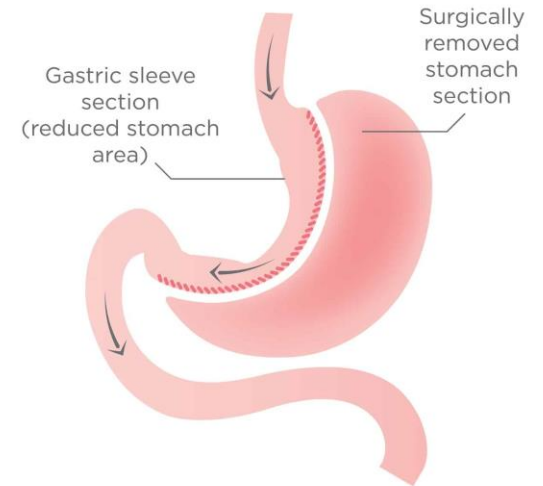
Evidence suggests improvement in type 2 diabetes even independently of weight loss<sup>2</sup>

Leads to 15–30% weight loss<sup>3</sup>

BEFORE  
**SLEEVE GASTRECTOMY**  
WEIGHT LOSS SURGERY



AFTER  
**SLEEVE GASTRECTOMY**  
WEIGHT LOSS SURGERY



GERD is a large factor in determining if VSG or RYGB is best for a patient

Patients with GERD are known to be poor candidates<sup>2</sup>

# ROUX-EN-Y GASTRIC BYPASS (RYGB)

Favorable changes in gut hormones and neuroendocrine signaling involved in hunger, satiety and induction of type 2 diabetes<sup>1</sup> is responsible for the weight reduction<sup>1,2</sup>

Reduces the stomach to a small pouch size of ~30 mL and connects it directly to a more distal section of the small intestine (permanent)<sup>1</sup>

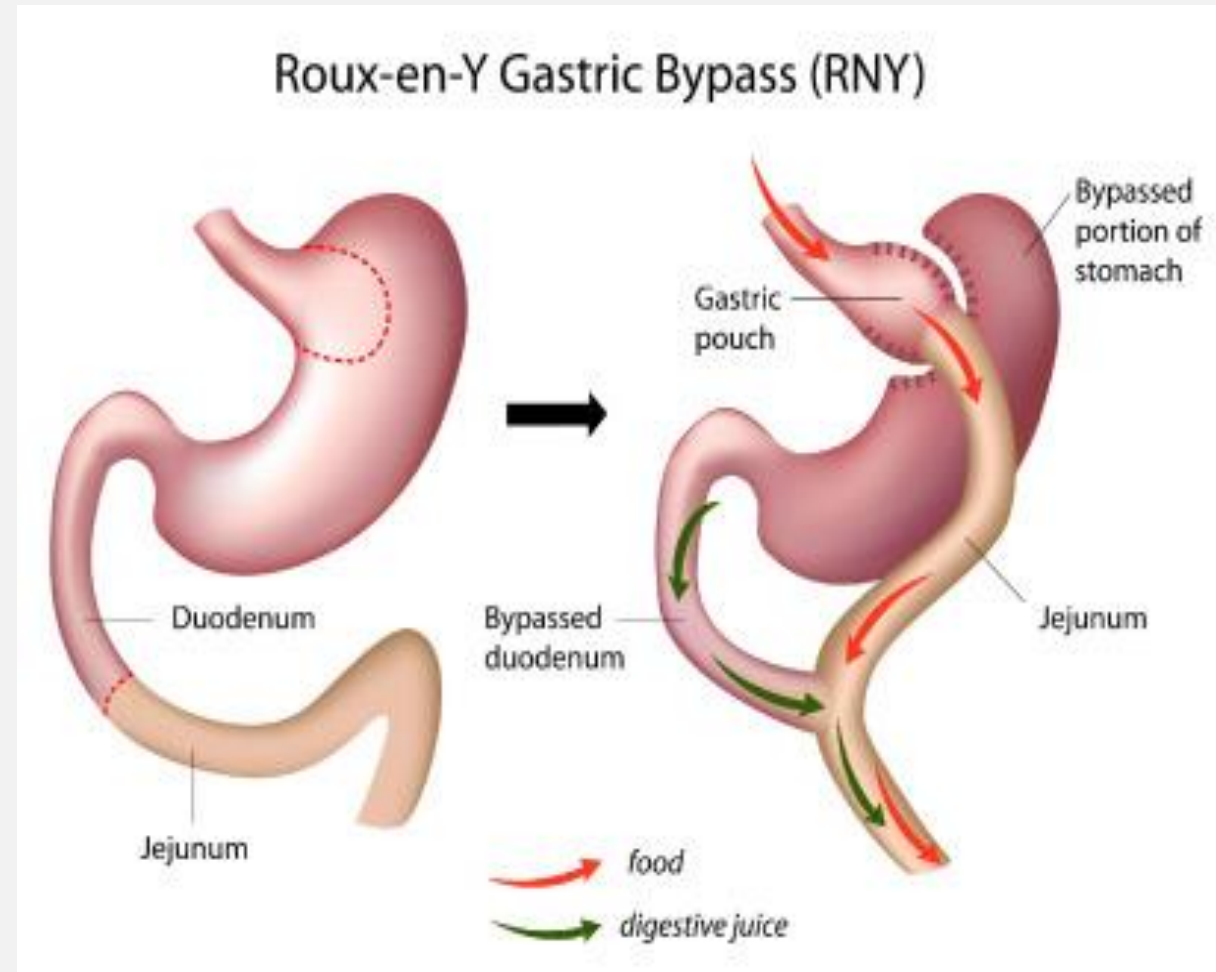
Reduces food and calorie intake<sup>1</sup>

Bypasses a section of the small intestine, inhibiting absorption<sup>1,3</sup>

Requires biochemical surveillance of nutritional status and bariatric surgery follow-up every 3 or 6 months (during first 2 years post surgery)<sup>2</sup>

Roux-en-Y gastric bypass leads to weight loss of 30–35% and has been shown to be more effective than VSG<sup>4</sup>

Resolves GERD in patients with known GERD prior to surgery<sup>1</sup>



# CASE CONTINUED

Mrs. S decides to undergo bariatric surgery. She continues to do well with nutrition, food journaling and exercise. After surgery, she would like to know what labs can her PCP check?

## **PCP CARE FOLLOWING BARIATRIC SURGERY**

- Patients should be encouraged to consume at least 60-80 grams of protein per day.
- 1-2 adult multivitamins plus minerals (iron, folic acid and thiamine) or specialized bariatric multivitamin
- Calcium 1200-1500 mg + Vitamin D 3000 units/day



## LABS TO CHECK

Initially at 1, 3, 6, 12 months	<b>SG:</b> CMP, CBC w/platelets, TSH, iron, Vit D, calcium, Vit B12
	<b>RYGB:</b> CMP, CBC w/platelets, TSH, iron, calcium, vit B12, folate, 25-vitamin D, iPTH, Vit A
In high-risk groups or with specific clinical indications at 1, 3, 6, 12 months	<b>SG:</b> Thiamine
	<b>RYGB:</b> Thiamine, copper, zinc, selenium
Annual screening	<b>SG:</b> Vit B12, folate, Vit D, iron
	<b>RYGB:</b> Vit B12, folate, vit D, iron, Vit A
Screening for CVD risk assessment	Lipid panel every 6 to 12 months based on risk and therapy. HbA1c in patients with diabetes

# CASE CONTINUED

She continues to do great after surgery. At her one year follow up, Mrs. S is down 50+ lbs, now weighing 150 lbs, BMI 26.6 (25% weight loss). She would like to know what are the best tips on maintaining weight loss?

# TUG OF WAR



# WEIGHT LOSS AND MAINTENANCE IS CHALLENGING

Therapies that promote weight loss  
(all aiming for calorie deficit)<sup>1</sup>



Lifestyle-based



Pharmacologic



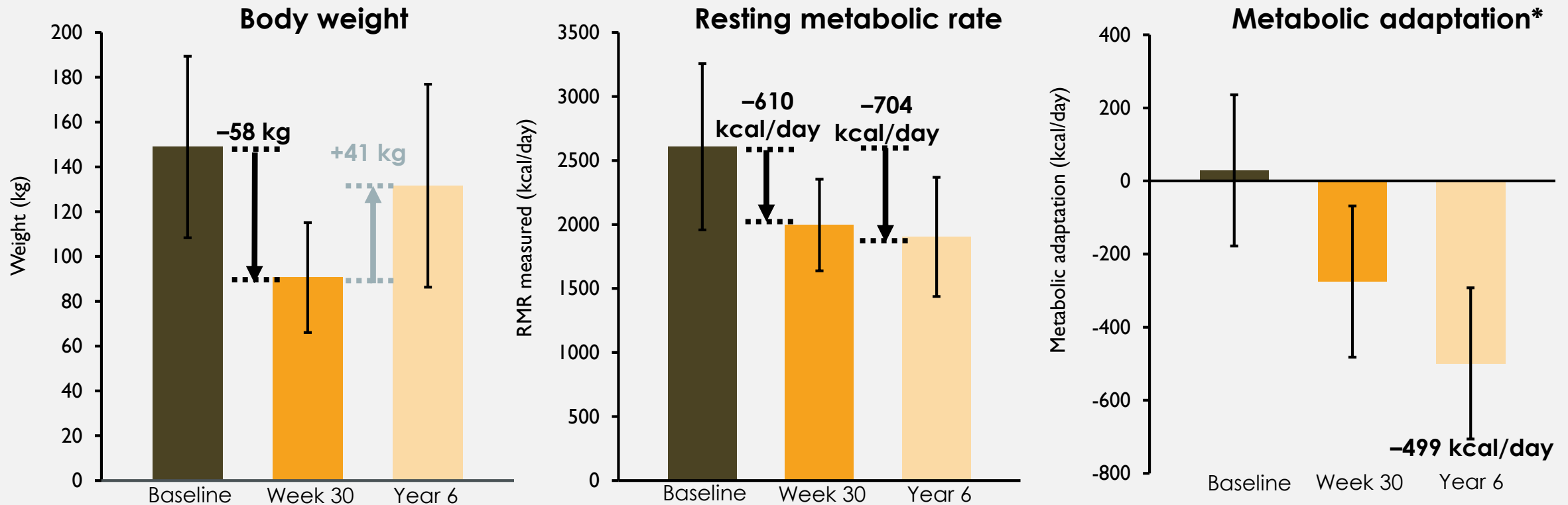
Surgical

Biologic adaptations respond  
to caloric deficits<sup>2</sup>

- Subjective perception of appetite  
(↑ hunger/desire to eat)
- Hormone levels  
(↓ satiety hormones; ↑ hunger hormone)
- Metabolism (↓ energy expenditure)

The cycle of weight loss and weight regain may be emotionally, physically, and economically challenging<sup>3,4</sup>

# PERSISTENT METABOLIC ADAPTION FOLLOWING “THE BIGGEST LOSER®” COMPETITION



Weight regain was observed 6 years after competition due to persistent metabolic adaptation counteracting weight loss

Error bars represent standard deviation. Data are for 14/16 participants in the 30-week The Biggest Loser® weight-loss competition.

\*Defined as the residual resting metabolic rate after adjusting for changes in body composition and age.

RMR, resting metabolic rate. Fothergill E et al. Obesity (Silver Spring) 2016;24:1612-19.

## STRATEGIES ASSOCIATED WITH LONG-TERM MAINTENANCE OF WEIGHT LOSS

- Frequent self- monitoring
- High levels of physical activity (average 60 minutes/day)
- Eating a low-calorie, low-fat diet
- Smaller and more frequent meals/snacks throughout the day
- Consistently eating breakfast
- More frequent at-home meals compared with restaurant and fast-food meals
- Use of portion-controlled meals or meal substitutes
- Maintaining a consistent eating pattern across the entire week

# KEY TAKEAWAYS

- The disease of obesity is a chronic, progressive disorder of the energy homeostasis system associated with a reduction in life expectancy and serious complications such as CVD and T2DM
- A multidisciplinary approach in management of obesity leads to improved patient outcomes
- Lifestyle intervention is the foundation of obesity management that is comprised of behavior modification, improved food choices, increased physical activity, stress reduction, and sleep hygiene
- Anti-obesity medications are generally safe and effective, and they act on various physiological pathways to reduce appetite and thus induce weight loss and reduce the risk of various obesity-related complications and comorbidities.

## KEY TAKEAWAYS CONTINUED

- Bariatric surgery provides the largest and most durable weight losses of any obesity intervention that appears to cause physiological changes that are in part responsible for the improvement and resolution of many complications of obesity, however only utilized in 1% of those who qualify
- Bariatric surgery patients benefit from being in a multidisciplinary program so they can be safely managed before and after surgery
- The body demonstrates a variety of adaptations to weight loss that promote weight regain after a caloric deficit



**QUESTIONS?**

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