

# Nutrition, Obesity and Cardiovascular Disease

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# Disclosure

- ▶ I have nothing to disclose.

# Objectives

- ▶ Review the complexity of obesity and review lifestyle, medical and surgical treatment options
- ▶ Recognize nutritional components of a heart-healthy diet
- ▶ Discuss practical strategies towards a healthy lifestyle

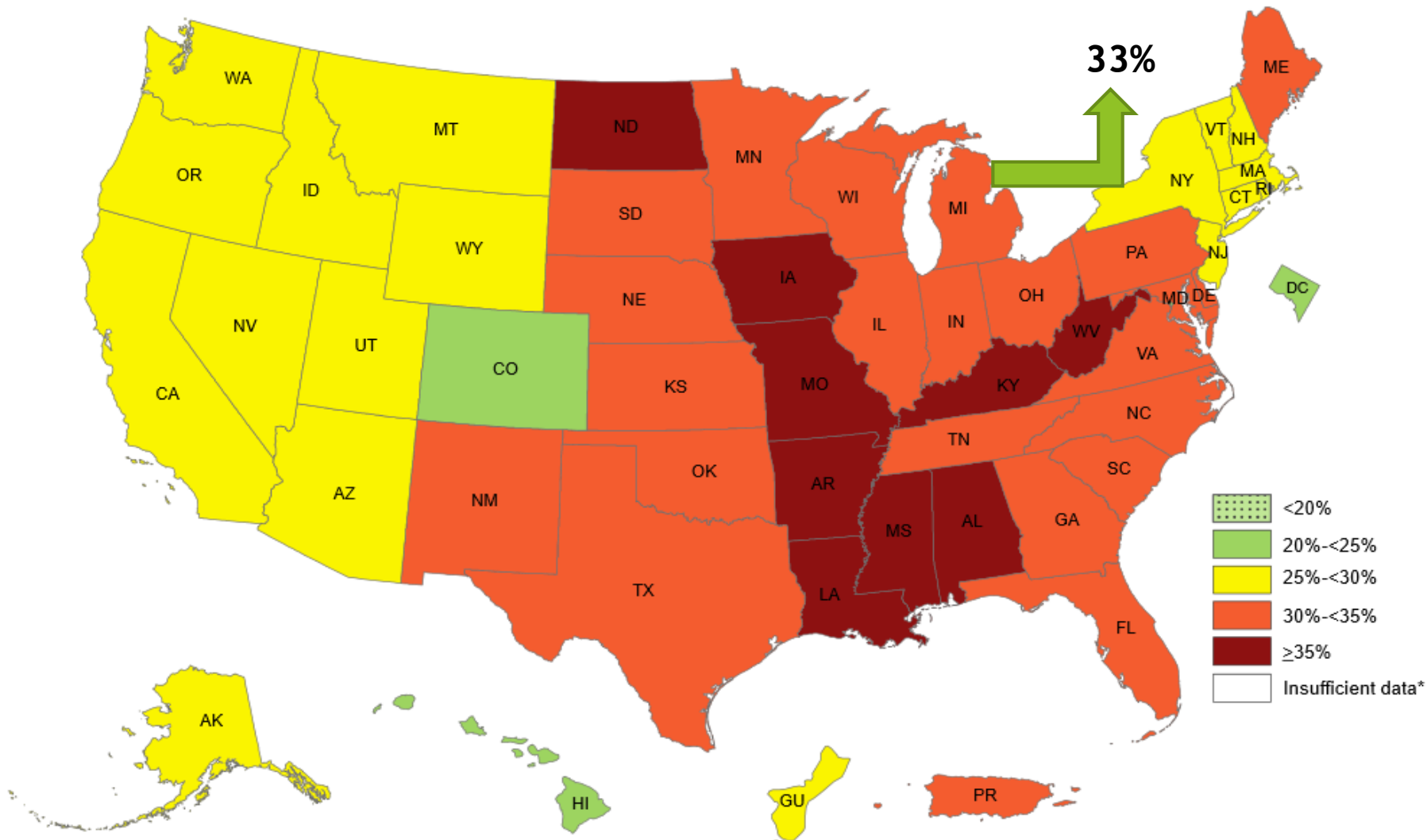
# What is Obesity?

- ▶ Obesity officially recognized as a disease by American Medical Association on June 18, 2013
- ▶ Excess fat accumulation that may cause an adverse effect on health
- ▶ *Common measure*
  - ▶ Body Mass Index (**BMI**) =  $\text{kg}/\text{m}^2$ 
    - ▶ Overweight: 25 - 29.9  $\text{kg}/\text{m}^2$
    - ▶ Obesity:  $\geq 30 \text{ kg}/\text{m}^2$
- ▶ Independent risk factor for CVD
  - ▶ WC (>88 cm female, >102 cm male)
  - ▶ WHR (>0.85 female, >0.90 male)

# Overweight and Obesity Trends

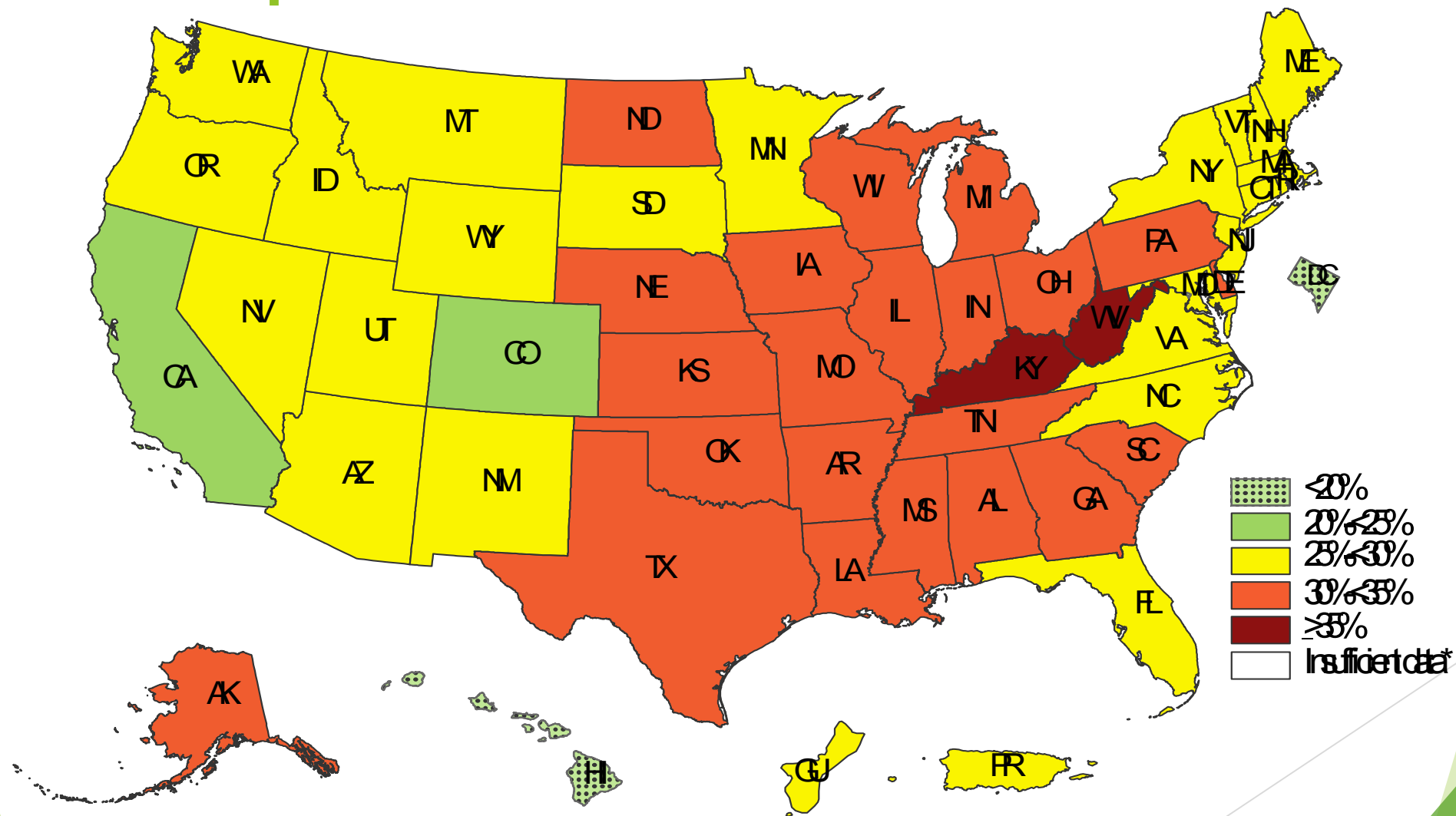
- ▶ 71.6% of US adults have Overweight/Obesity
- ▶ 39.8% of US adults with Obesity
  - ▶ 93.3 million adults
- ❖ 35.7% among adults aged 20 to 39 years
- ❖ 42.8% among adults aged 40 to 59 years
- ❖ 41.0% adults aged 60 and older

# Prevalence of Self-Reported Obesity Among U.S. Adults by State and Territory, 2016-2018

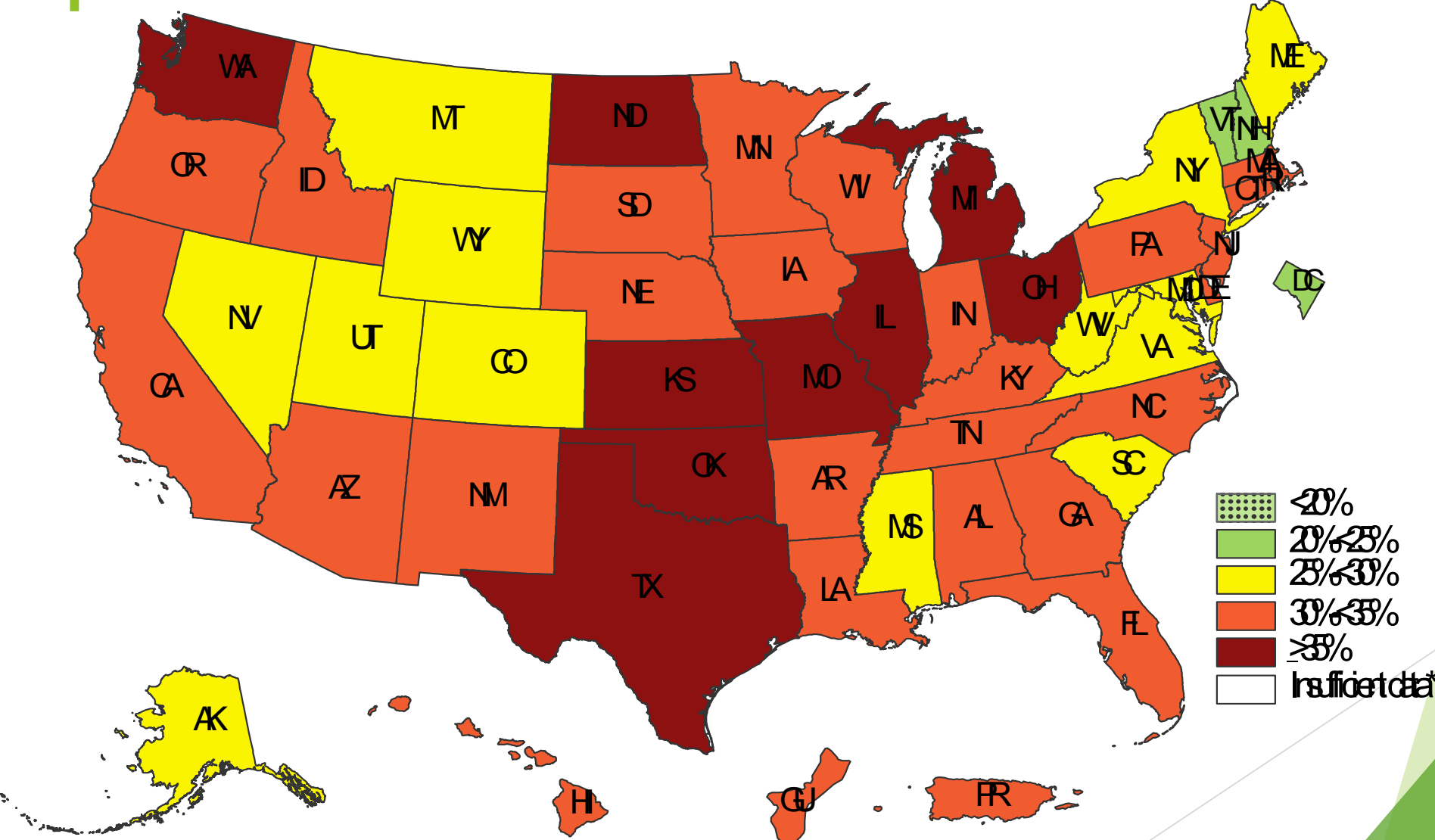


Content source: [Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion](#)

# Prevalence of Self-Reported Obesity Among Non-Hispanic White Adults



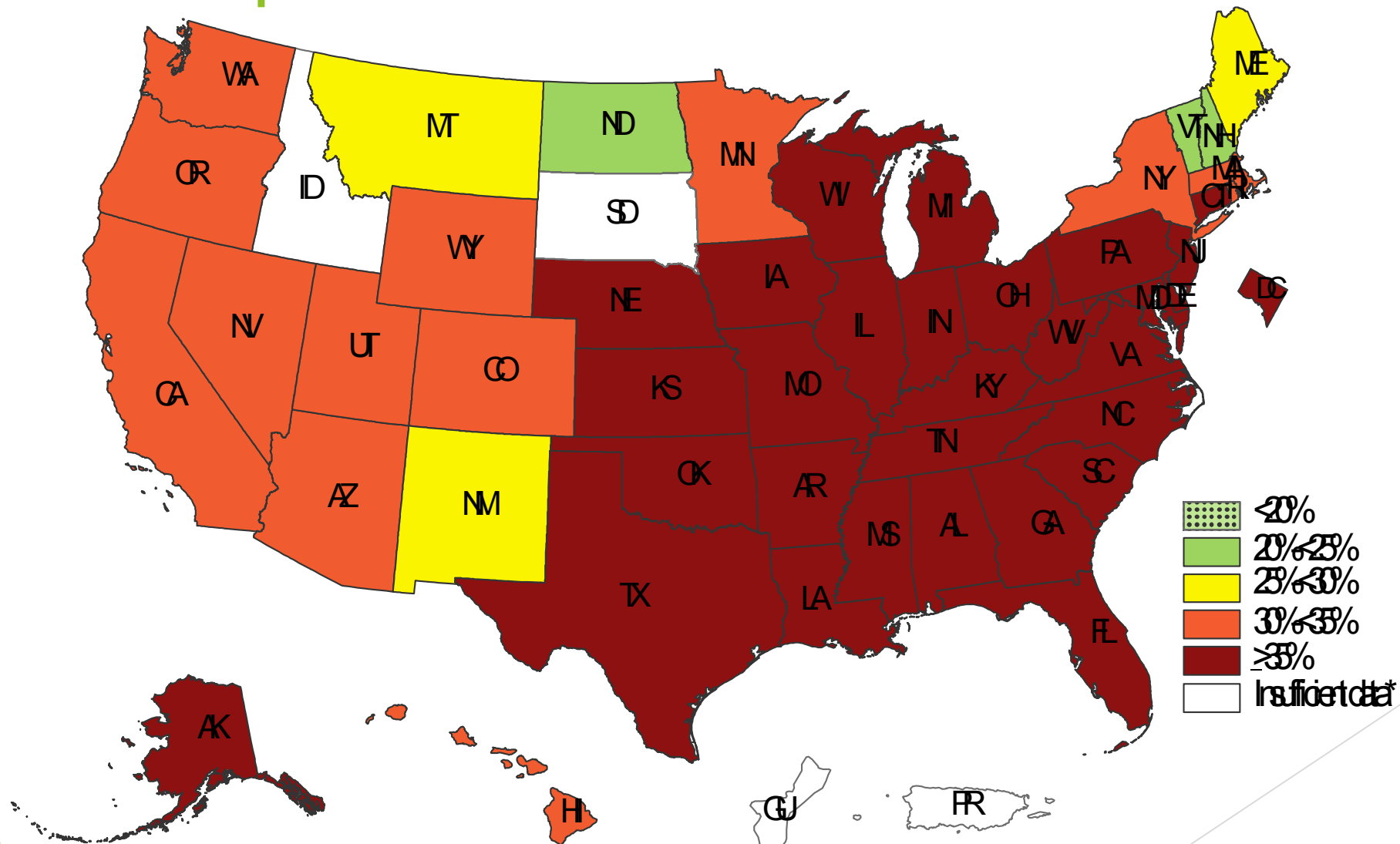
# Prevalence of Self-Reported Obesity Among Hispanic Adults



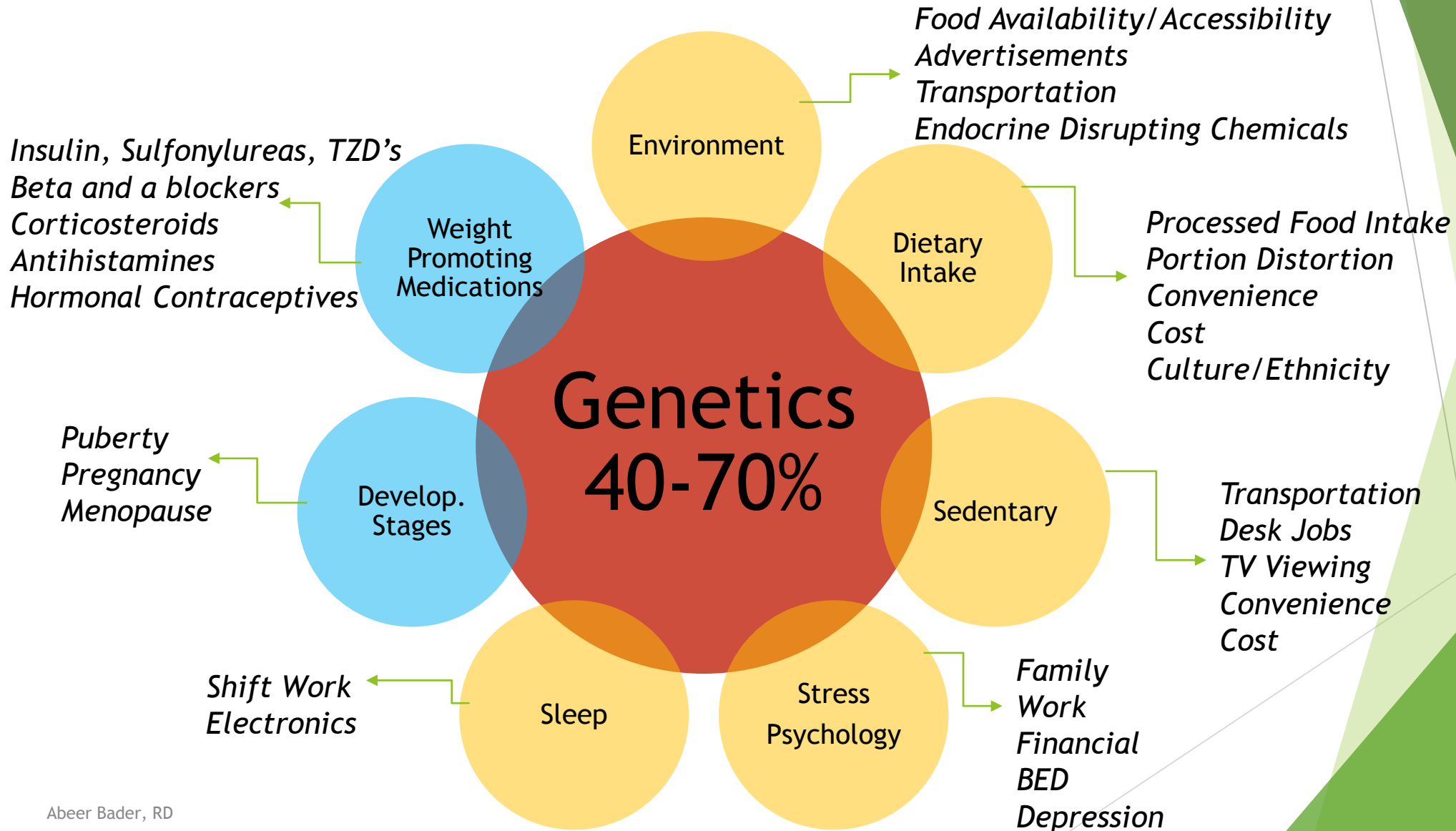
Content source: [Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion](#)



# Prevalence of Self-Reported Obesity Among Non-Hispanic Black Adults

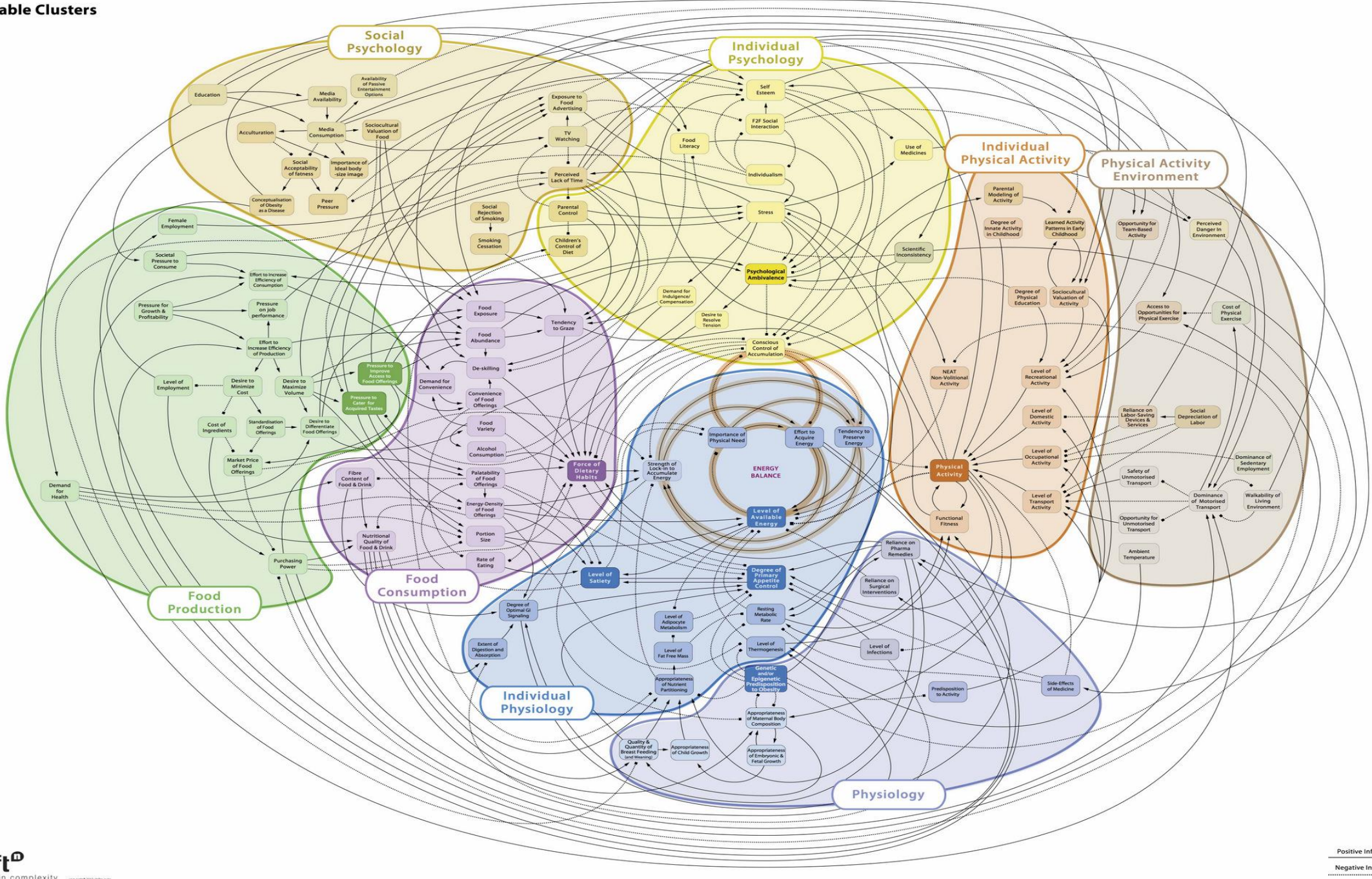


# Contributors to Weight Gain



# Obesity System Map

## Variable Clusters



- Media
- Social
- Psychological
- Economic
- Food
- Activity
- Infrastructure
- Developmental
- Biological
- Medical



# 57 Varieties of Obesity

Leptin deficiency  
LepR deficiency  
POMC deficiency  
MC4R deficiency  
aMSH deficiency  
Sim-1 deficiency  
PC-1 deficiency  
KSR2 deficiency  
MRAP2 deficiency  
SH2B1 deficiency  
BDNF deficiency  
trkB deficiency  
Carpenter syndrome  
Cohen syndrome  
Ayazi syndrome  
MOMO syndrome  
Rubenstein-Taybi syndrome  
Fragile X syndrome  
Albright osteodystrophy

Prader- Willi syndrome  
Bardet-Biedl syndrome  
Alstrom syndrome  
BFL syndrome  
Hypothalamic  
Hyperphagic  
Thermogenesis deficient  
Circadian-disrupted  
Stress-induced  
Viral  
Central  
Peripheral  
Diffuse  
Neonatal  
Early childhood  
Peripubertal  
Gestational  
Menopausal  
"Healthy"  
Metabolic

Inflammatory  
Diet-dependent  
Exercise-sensitive  
Sleep-sensitive  
Insulin-induced  
Steroid-induced  
Progesterone-induced  
Psychotropic-induced  
Antibiotic-induced  
Endocrine disruptor  
Phentermine-responsive  
Lorcaserin-responsive  
Topiramate-responsive  
Metformin-responsive  
Bupropion-responsive  
GLP-1 responsive  
Bypass-responsive  
Bypass-resistant  
Gastric band-responsive

# Obesity Related Co-Morbidities



# Sustained Weight Loss of 5-10% Total Body Weight Improves Health

- ▶ Improves cholesterol
- ▶ Lowers triglycerides
- ▶ Lowers blood pressure
- ▶ Lowers blood sugar
- ▶ Improves reflux
- ▶ Improves sleep apnea
- ▶ Decreased need for certain medications

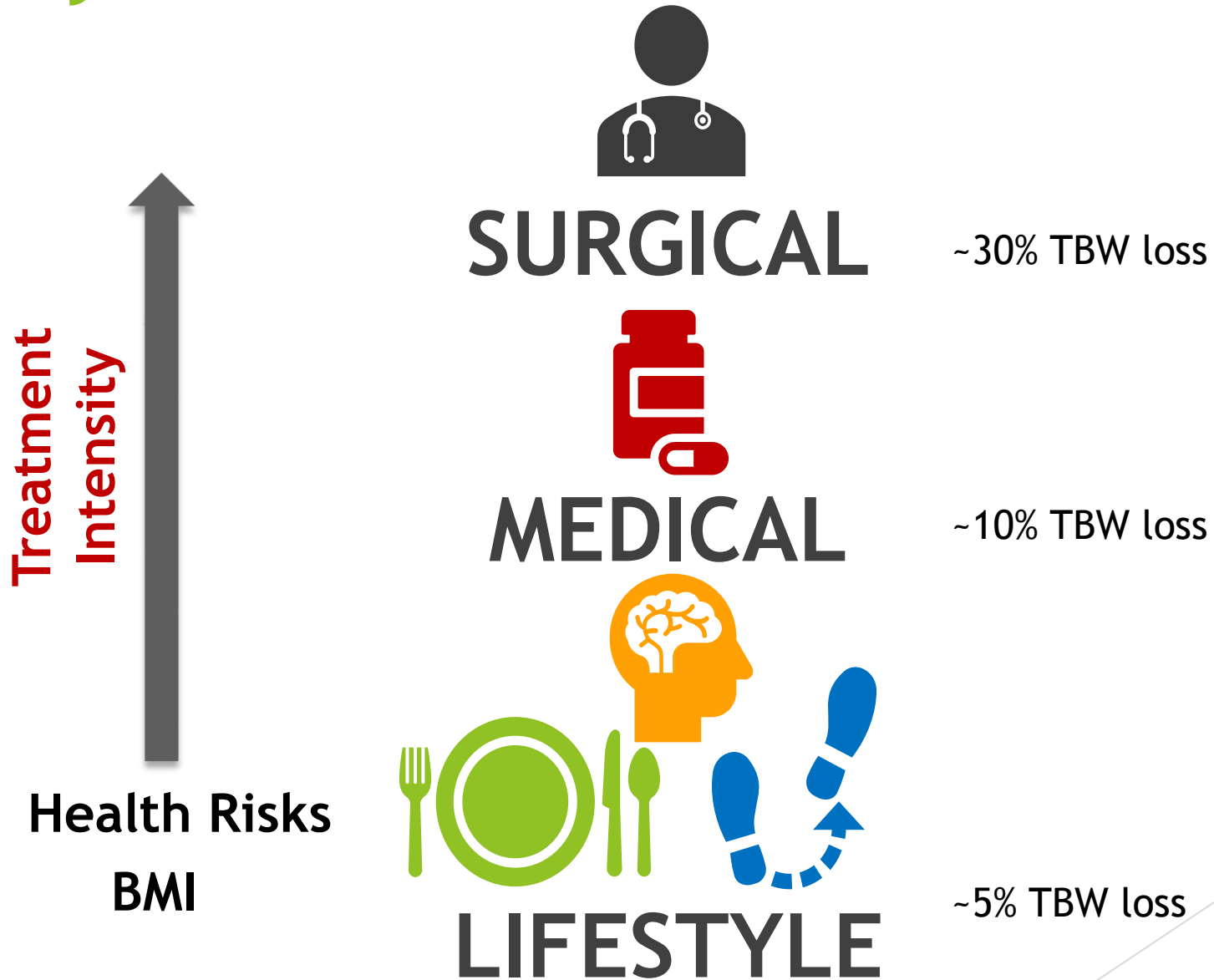
In overweight/obesity with or without cardio risk, dose response:

- ✓ 3 kg weight loss, 15 mg/dl reduction in TG
- ✓ 5-8 kg weight loss, 5 mg/dl reduction in LDL, 2-3 mg/dl increase in HDL

In overweight/obesity at risk for type T2DM

- ✓ 2.5 – 5.5 kg weight loss, reduce T2DM progression by 30-60%

# Obesity Interventions



# Nutrition Intervention for Improved Body Weight and Heart Health

- ▶ Caloric Restriction
- ▶ Intermittent Fasting
- ▶ Mediterranean
- ▶ DASH Diet
- ▶ Plant Based
- ▶ Low Carb? Low Fat?
  - ▶ Cardio Health: Lower carbohydrate shows greater reduction in triglyceride and larger increase in HDL than low fat

**The diet of choice is the one  
the patient will  
adhere to for life**

Factors to consider:

- ✓ Individualized Needs (Preference, Health, Finance, Culture, Accessibility)



# Nutrition Intervention

## ▶ Recommended Caloric Intake for Weight Loss

- ▶ Females: 1200 - 1500 kcal/d
- ▶ Males: 1500 - 1800 kcal/d

## ▶ Caloric Deficit

- ▶ 500 - 1000 kcal/d reduction

## ▶ Meal Replacements

- ▶ High degree of Structure, Convenience, Portion Controlled; *Monotonous, Cost*
- ▶ **Low Calorie Diet (LCD):** 800 - 1000 kcal/d, medically monitored
  - ▶ 9.7% BW reduction at 4 months, 6.3% reduction at 1 year
- ▶ **Very Low Calorie Diet (VLCD):**  $\leq$  800 kcal/d, medically monitored
  - ▶ 16.1% reduction at 4 months, 5.0% reduction at 1 year

# Determining Energy Needs

Referral to Obesity trained RD recommended

1. Indirect Calorimetry (Golden Standard)

2. Mifflin St Jeor Equation

▶ Men

$10 \times \text{weight (kg)} + 6.25 \times \text{height (cm)} - 5 \times \text{age (y)} + 5$

▶ Women

$10 \times \text{weight (kg)} + 6.25 \times \text{height (cm)} - 5 \times \text{age (y)} - 161$

❖ Add Activity Factor once RMR/BMR determined

❖ Subtract 500 - 1000 kcal/d for weight loss

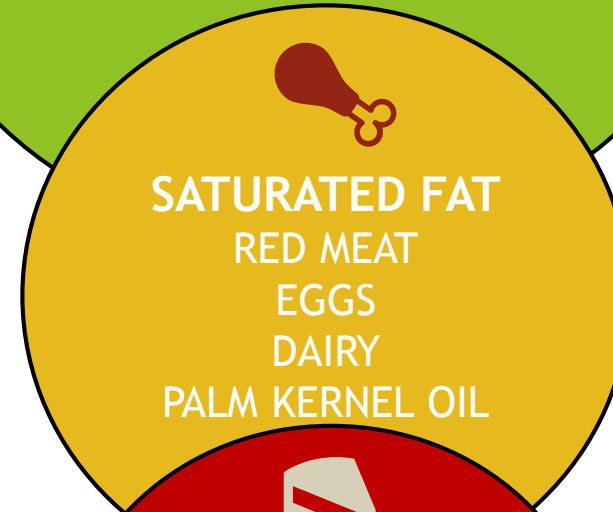
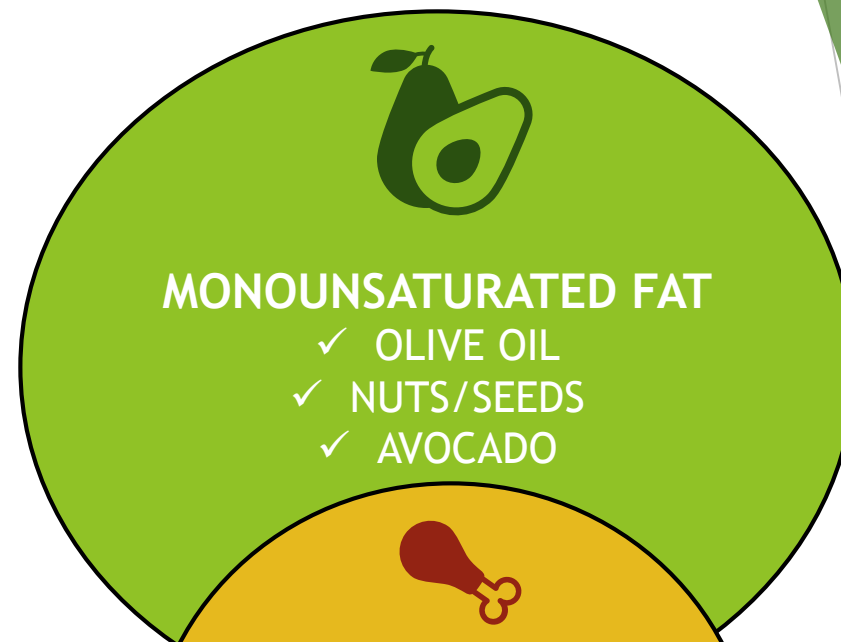
# Implementing Nutrition Intervention in Practice

- ▶ For weight loss it is recommended that patients have at least  $\geq 14$  visits in a period of 6 months
  - ▶ Group Education
  - ▶ Individual MNT
  - ▶ Electronic (ideal to have behavioral component as face to face more effective)
- ▶ For weight maintenance it is recommended that patients come in monthly for at least 1 year

**Achieving weight loss requires  
commitment from patients**

# Heart Healthy Diet

- ▶ Avoid Trans Fat
- ▶ Limit Saturated Fat
- ▶ Replace with Unsaturated Fat
- ▶ Omega-3
  - ▶ Cold Water Fatty Fish (+2x/wk)
- ▶ Dietary Fiber (25-50 g/d)
  - ▶ Fruits (2-3 servings/d)
  - ▶ Vegetables (+3 servings/d)
  - ▶ Legumes (Meatless Mondays?)
  - ▶ Grains (Barley, Freekeh, Quinoa)
- ▶ Water



Avoidance of SSB, Excessive alcohol, Refined Carbohydrates, Processed Meats, Fried Foods

# Barriers to Healthy Eating

- ▶ **Time**
  - ▶ Lack of time to prepare foods
  - ▶ Work and commuting demands
- ▶ **Cost**
  - ▶ Fast food, non-perishables - cheaper
- ▶ **Convenience**
- ▶ **Cooking Skills**

**ADDRESS BARRIERS  
+  
SET REALISTIC  
INDIVIDUALIZED GOALS**

# Predictors of Weight Maintenance

- ▶ 98% of participants modified their food intake
  - ▶ Track food, count calories
  - ▶ Less than 30% calories from fat, limit eating OUT
- ▶ 94% increased their physical activity (walking)
- ▶ **Predictors in Weight Maintenance:**
  - ▶ 78% eat breakfast every day
    - ▶ Eat similar food regularly
  - ▶ 90% exercise, on average, about 1 hour per day
  - ▶ 75% weigh themselves at least once a week
  - ▶ 62% watch less than 10 hours of TV per week



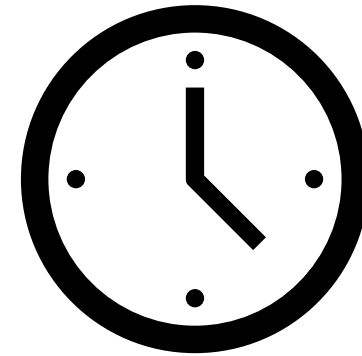
## Self-Monitoring

- ✓ Accountability
- ✓ Detect Patterns
- ✓ Mindfulness

# Physical Activity Guidelines

## ▶ Health Benefits

- ▶ 150 minutes of aerobic physical or 75 minutes of vigorous physical activity + strength training
  - ▶ Moderate: can talk but difficulty singing
  - ▶ Vigorous: difficulty talking



## ▶ Weight Maintenance or Weight Loss

- ▶ 300 minutes of aerobic physical activity weekly + strength training

## ▶ Strength Training Recommendation:

- ▶ 20 - 30 minutes resistance physical activity 2-3 times per week

**What about the rest of the day? Activity of Daily Living**

# Physical Activity Practical Tips

- ▶ Baseline level of activity
- ▶ Barriers to activity
  - ▶ Physical limitations?
  - ▶ Financial? Time? Weather?
- ▶ SMART Goal Setting
  - ▶ Specific
  - ▶ Measurable
  - ▶ Attainable
  - ▶ Realistic
  - ▶ Timely

**ADDRESS BARRIERS  
+  
SET REALISTIC  
INDIVIDUALIZED GOALS**



# Medical Intervention

## ▶ Indications

- ▶ BMI  $\geq 27$  kg/m<sup>2</sup> + Co-morbidity
- ▶ BMI  $\geq 30$  kg/m<sup>2</sup>

## ▶ Weight loss Medications Mechanism of Action:

- ▶ Decrease hunger
  - ▶ Increase satisfaction with less food
  - ▶ Reduce bingeing and cravings
  - ▶ Reduce preoccupation with food
  - ▶ Inhibits fat digestions/absorption
  - ▶ Possibly increase metabolism
- ▶ In combination with lifestyle changes
  - ▶ Long-term use to maintain weight loss
  - ▶ Combination medications may be necessary



# Medical Intervention

## FDA APPROVED

Lifestyle intervention must continue  
Typically discontinue if less than 3-5% weight loss in 12 weeks

Weight-Loss Medications	% Wt Loss	Mechanism	Contraindication
Phentermine	-	Reduce hunger through norepinephrine release	CVD, uncontrolled HTN, hyperthyroidism, hx drug abuse, MAOI, tricyclic antidepressants, pregnancy
Lorcaserin (Belviq)	3.0-3.6%	Reduce hunger, increase satiety by activating serotonin receptor in brain	Congestive heart failure, pregnancy
Liraglutide (Saxenda)	5.6%	Increase length of satiety by decrease rate of gastric emptying, affects glucose homeostasis, GLP-1	Medullary thyroid cancer, pregnancy
Orlistat (Xenical)	4.0%	Lipase inhibitor prevents fat absorption	Cholestasis, malabsorption issues, pregnancy
Naltrexone + Bupropion (Contrave)	4.2-5.2%	Reduce hunger and food craving Naltrexone - opiate antagonist Bupropion - suppresses appetite, reuptake inhibitor of dopamine and norepinephrine	Uncontrolled HTN, seizure disorder, MAOI, pregnancy
Phentermine + Topiramate (Qsymia)	6.6%	Topiramate - reduces appetite and food cravings by augmenting activity of GABA	CVD, uncontrolled HTN, hyperthyroidism, hx drug abuse, MAOI, tricyclic, antidepressants, pregnancy

# Medical Intervention OFF LABEL USE

- ▶ Metformin
- ▶ Victoza
- ▶ Exenatide
- ▶ Topiramate
- ▶ Zonisamide
- ▶ Bupropion
- ▶ Naltrexone

# Surgical Intervention

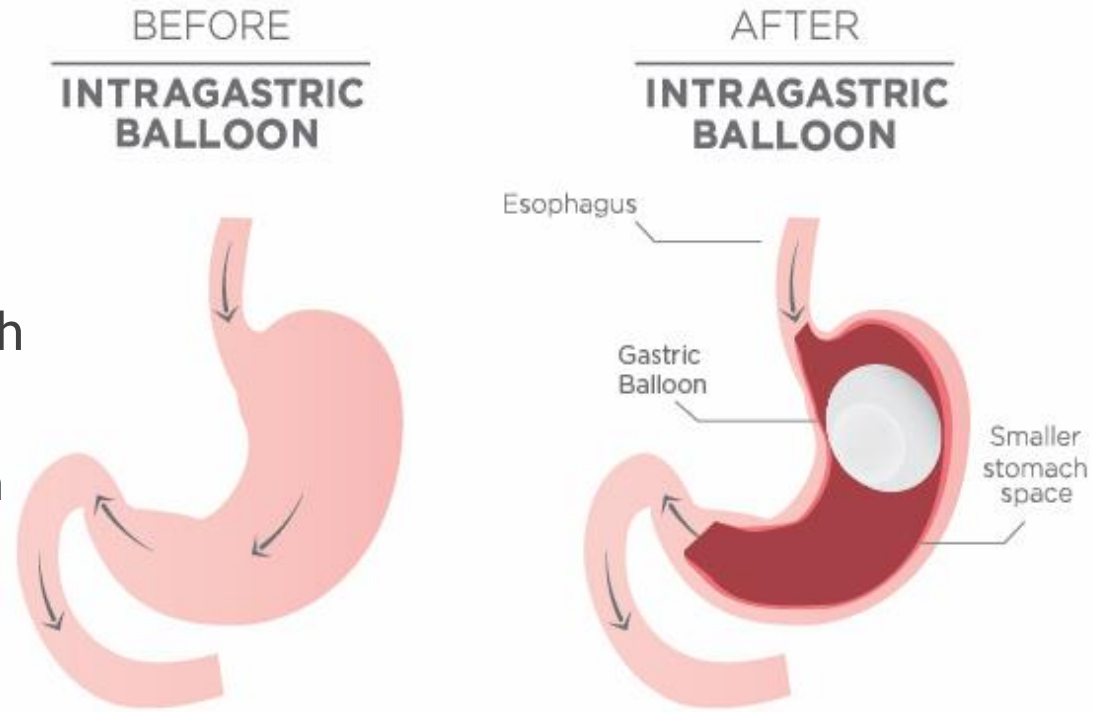
- ▶ Indications:
  - ▶ BMI  $\geq 35$  kg/m<sup>2</sup> + Obesity Related Co-Morbidity
  - ▶ BMI  $\geq 40$  kg/m<sup>2</sup>
- ▶ **Most effective long-term therapy for obesity**
- ▶ Metabolic therapy leading to significant improvement/remission of disease caused by obesity including cardiovascular disease and diabetes
- ▶ Increased life expectancy by 89%

# Surgical Intervention

## Gastric Balloon

- ▶ Indications:

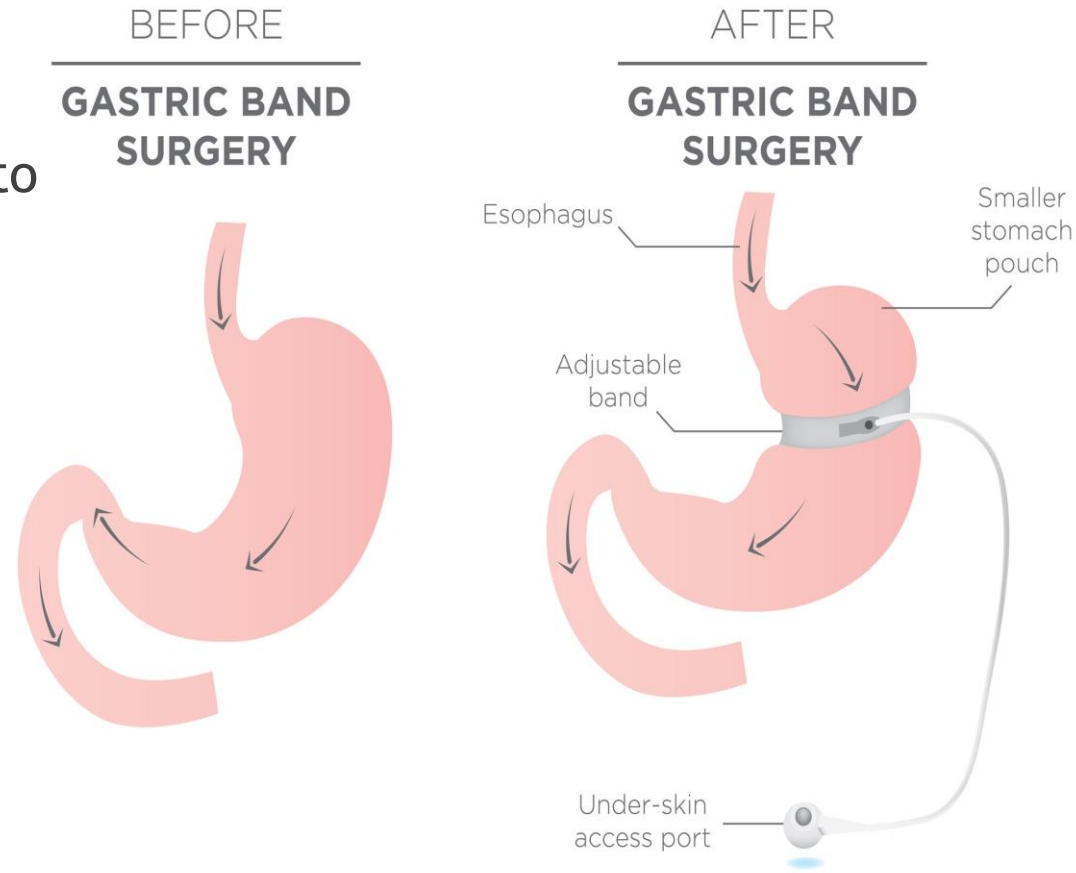
- ▶ BMI 30 - 40 kg/m<sup>2</sup>
- ▶ Endoscopic procedure; balloon inserted in stomach and filled with saline
  - ▶ Must be removed 6 month post insertion
- ▶ Not covered by insurance ~\$10,000
- ▶ EWL ~20%



# Surgical Intervention

## Gastric Band

- ▶ Re-operation rate is ~25%, up to 60% at 10 years due to
  - ▶ Band slippage/erosion
  - ▶ Band port/site infection
  - ▶ Intolerance of band
  - ▶ Inadequate weight loss
- ▶ EWL of ~45%

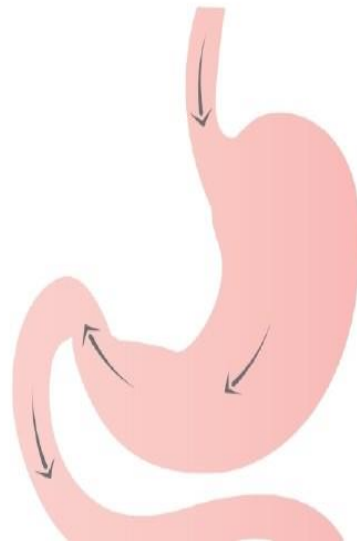


# Surgical Intervention

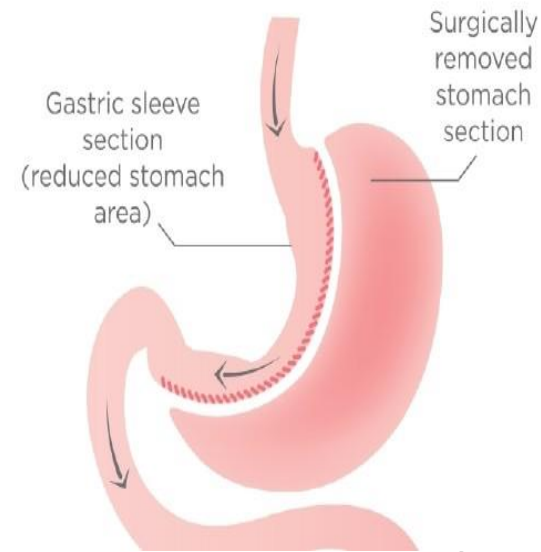
## Gastric Sleeve

- ▶ Most commonly performed
- ▶ ~80% of the stomach removed
- ▶ Restrictive and Metabolic
- ▶ Lower complications
- ▶ Lifelong need for vitamin and minerals
- ▶ EWL of ~55%

BEFORE  
SLEEVE GASTRECTOMY  
WEIGHT LOSS SURGERY



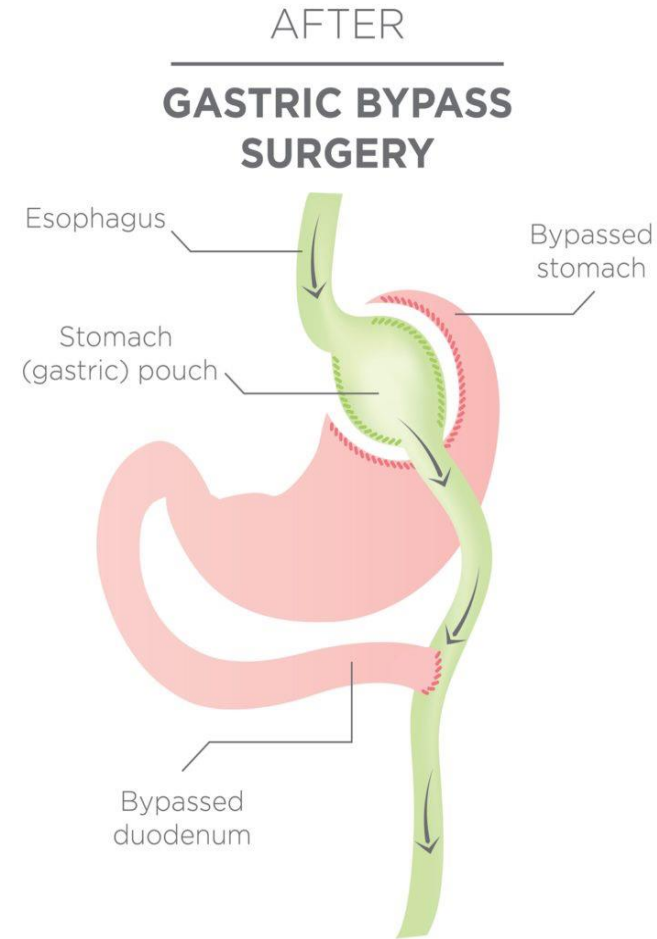
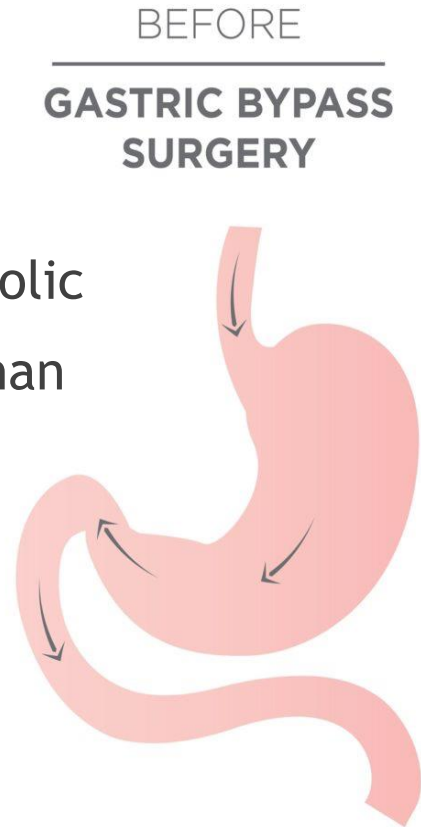
AFTER  
SLEEVE GASTRECTOMY  
WEIGHT LOSS SURGERY



# Surgical Intervention

## Roux-en-Y Gastric Bypass

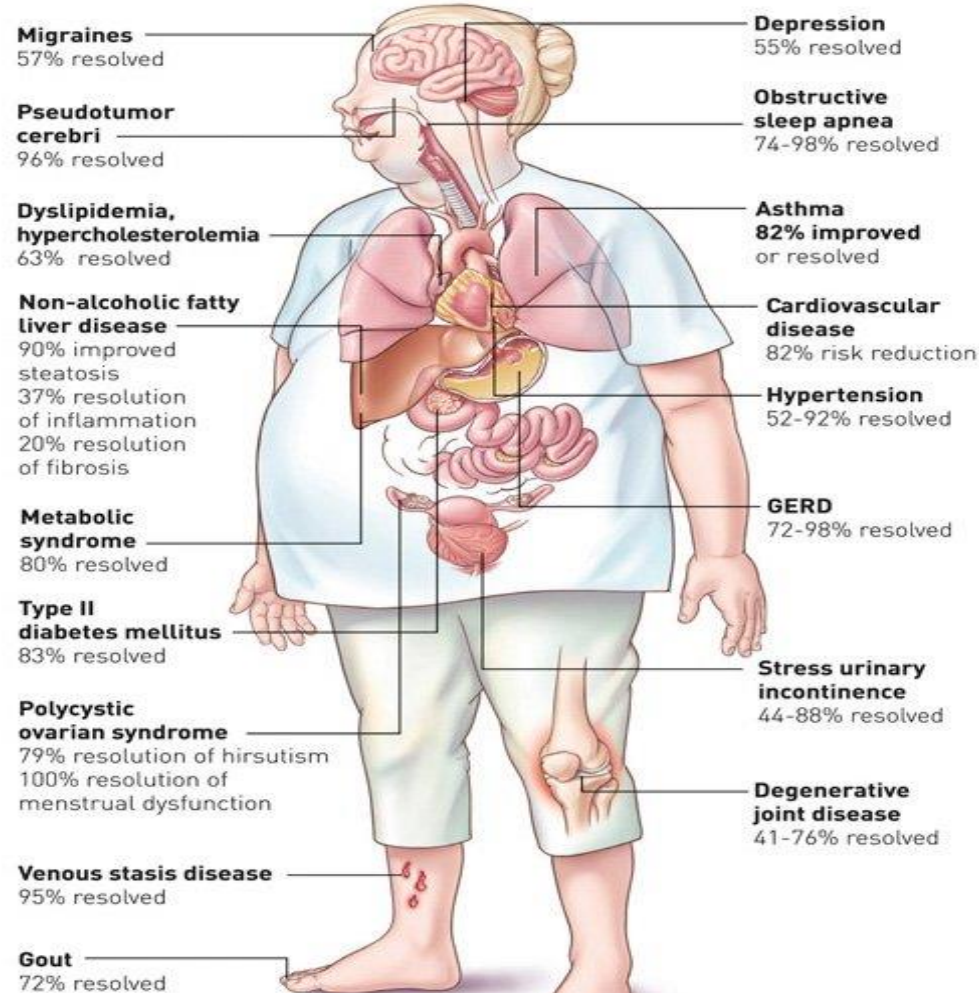
- ▶ Alteration of food pathway
- ▶ Restrictive and Metabolic
- ▶ More complications than sleeve
  - ▶ Dumping syndrome
- ▶ Lifelong need for vitamin and minerals
- ▶ **EWL ~70%**





# Co-Morbidity Reduction After Bariatric Surgery

## Co-morbidity Reduction After Bariatric Surgery



**Quality of life improved in 95% of patients**

CCF ©2005  
Courtesy ClevelandClinic

**Mortality 89% reduction in 5-year mortality**

# Lifestyle Recommendations for Patients

- ✓ Self-Monitoring
  - Keep track of food/beverage intake
  - Physical activity
  - Weight
- ✓ Plan Ahead
  - Structured meals (Quality, Protein + Fiber)
  - Carry health snack
  - Review restaurant menu
- ✓ Mindfulness
  - Head versus physical hunger
- ✓ Sleep 8 hours
- ✓ 60 minutes walking most days in the week (*helps with stress too*)
- ✓ Find Support
- ✓ Don't give up
  - Long-term disease, requires lifestyle changes and weight maintenance

**Practice the basics  
of self-care**  
*Know you have the right  
to be healthy and happy*

# Recommendations in Treatment of Obesity

- ▶ Prevent Weight bias
- ▶ Understand Weight Trend and Timeline
  - ▶ Address trend with patient
  - ▶ Acknowledge weight maintenance
- ▶ Severity of Obesity
  - ▶ Discussion with patients re appropriate treatment options
    - ▶ Get thorough weight hx to better treatment plan
    - ▶ Open ended questions re previous weight loss attempts, readiness, confidence in treatment plan

## How to Prevent Weight Bias?

- ❖ People First Language
- ❖ Appropriate Size Chairs
- ❖ Appropriate BP Cuff Size
  - ❖ Obesity Complex

*Avoid blame and simplicity of only needing to eat less and be PA*

# Obesity Treatment, Beyond the Guidelines

## Practical Suggestions for Clinical Practice

Scott Kahan, MD, MPH<sup>1,2</sup>; JoAnn E. Manson, MD, DrPH<sup>3,4</sup>

> [Author Affiliations](#)

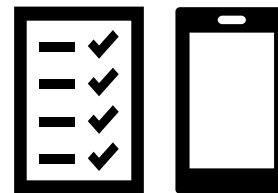
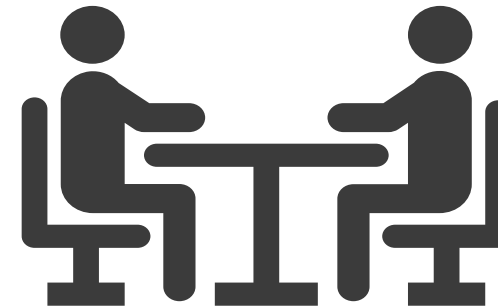
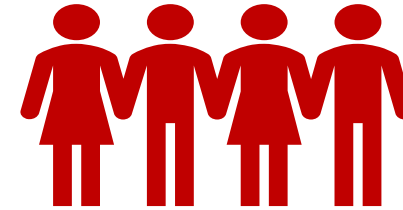
JAMA. 2019;321(14):1349-1350. doi:10.1001/jama.2019.2352

Table. An "ABCDEF" Approach to Guide Weight Counseling in Primary Care

Steps	What to Do
Ask "permission"	<ul style="list-style-type: none"><li>• Assess patient readiness to discuss weight issues. Consider beginning the conversation with questions such as, "Your weight has been increasing over the years, which could lead to diabetes and other health problems. Would it be okay if we started working together on this?"</li></ul>
Be systematic in the clinical workup	<ul style="list-style-type: none"><li>• Elicit weight history, motivations, barriers, and social determinants.</li><li>• Medications that may cause weight gain include some antidepressants, antipsychotics, insulin, sulfonylureas, steroids, and pain medications.</li></ul>
Counseling and support	<ul style="list-style-type: none"><li>• A wide range of dietary patterns can help weight management.</li><li>• Physical activity, even just walking, is essential for health.</li><li>• Use free online tools and resources, such as Dietary Guidelines for Americans, obesity treatment guidelines, and the Diabetes Prevention Program curriculum and handouts.</li></ul>
Determine health status	<ul style="list-style-type: none"><li>• Evaluate for weight-related health conditions (eg, diabetes, sleep apnea), physical limitations, and decreased quality of life.</li></ul>
Escalate treatment when appropriate	<ul style="list-style-type: none"><li>• Consider medication (BMI <math>\geq 27</math>) or bariatric surgery (BMI <math>\geq 35</math>) when weight-related health conditions are present.</li><li>• Medication options for long-term use include orlistat, lorcaserin, phentermine/topiramate-extended release, naltrexone/bupropion-sustained release, and liraglutide.</li></ul>
Follow up regularly and leverage available resources	<ul style="list-style-type: none"><li>• Create a care team by identifying local obesity specialists (eg, obesity medicine physicians, registered dietitians), community programs (eg, YMCA-based diabetes prevention program), and other resources (eg, commercial weight-loss programs, health coaches, digital or telehealth platforms).</li><li>• A few minutes at the end of an unrelated appointment can be used to check in on patients' progress and offer support.</li><li>• Utilize medical assistants and other office staff to save time by assisting with patient education, monitoring, and coordinating care.</li></ul>

# Recommendations in Treatment of Obesity

- ▶ Interdisciplinary Team
  - ▶ Referral to appropriate person
  - ▶ No one practitioner can provide all the skills necessary
  - ▶ Familiarize self with Weight Management programs in area
- ▶ Client Centered Care
  - ▶ Structure to treatment plan
  - ▶ Frequent visits
- ▶ Accountability/ Additional Support
  - ▶ Apps/ Telehealth
  - ▶ Group meetings
- ▶ Obesity treatment is challenging, lifelong commitment to improved health



# Questions?

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