Obesity Management in Primary Care

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Learning Objectives

▪ Discuss the health impact related to obesity and its associated disease risks

▪ Explain what qualifies as “meaningful” weight loss and its impact on your patients

▪ Review the FDA approved medications to help manage obesity
What is Obesity?

- A state of excess adipose tissue mass (*Harrison's: 21st edition*)
- A chronic, relapsing, multifactorial, 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 (*Obesity Medicine Association*)
- The WHO definition is:
  - BMI ≥ 25 is overweight
  - BMI ≥ 30 is obesity
    - BMI 30-35 CLASS 1 obesity
    - BMI 35-40 CLASS 2 obesity
    - BMI ≥ 40 CLASS 3 obesity (*Avoid the term morbid obesity*)

Table 1. Weight Classifications

<table>
<thead>
<tr>
<th>Classification</th>
<th>Body mass index (kg per m²)</th>
<th>Prevalence (%)</th>
<th>Waist circumference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
<td>NA</td>
<td>—</td>
</tr>
<tr>
<td>Normal weight</td>
<td>18.5 to 24.9</td>
<td>NA</td>
<td>Male &lt; 40 in (102 cm) Female &lt; 35 in (89 cm)</td>
</tr>
<tr>
<td>Overweight</td>
<td>25 to 29.9</td>
<td>33.6</td>
<td>—</td>
</tr>
<tr>
<td>Class 1 obesity</td>
<td>30 to 34.9</td>
<td>20.4</td>
<td>Male ≥ 40 in</td>
</tr>
<tr>
<td>Class 2 obesity</td>
<td>35 to 39.9</td>
<td>8.1</td>
<td>Female ≥ 35 in</td>
</tr>
<tr>
<td>Class 3 obesity</td>
<td>≥ 40</td>
<td>6.4</td>
<td></td>
</tr>
</tbody>
</table>

*NA = not available.*
*Information from references 1 and 3.*
Prevalence† of Self-Reported Obesity Among US Adults by State and Territory, BRFSS, 2011

†Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011. *Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.

Source: https://www.cdc.gov/obesity/data/prevalence-maps.html
Prevalence† of Self-Reported Obesity Among US Adults by State and Territory, BRFSS, 2018

†Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011. *Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.

Source: https://www.cdc.gov/obesity/data/prevalence-maps.html
Prevalence of Self-Reported Obesity Among Hispanic Adults, by State and Territory, BRFSS, 2016-2018

*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.
Source: https://www.cdc.gov/obesity/data/prevalence-maps.html
Prevalence of Self-Reported Obesity Among Non-Hispanic Black Adults, by State and Territory, BRFSS, 2016-2018

*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.
Source: [https://www.cdc.gov/obesity/data/prevalence-maps.html](https://www.cdc.gov/obesity/data/prevalence-maps.html)
Health Impact of Obesity in the United States

- Obesity in mid-life shortens life expectancy by 4-7 years
- Medical spending increased in obesity (2005 values)
  - Men +$1152/year
  - Women $3613/year
- Obesity medical costs in US $190 Billion, 21% of healthcare expenditures

Body Weight

Pressures to Be Less Physically Active

Sedentary workplaces/schools/entertainment
Activity “unfriendly” community design
Drive-through conveniences
Elevators/escalators
Remote controls
Labor-saving devices
Television/computer

Biology

E_{in}

Behavior

E_{out}

Pressures to Eat More

Portion Sizes
High Energy density
High glycemic index
Low Cost

Soft drinks/junk food
in schools
Added Sugar
Easy food access

Variety
Convenience
Great Taste
Ads/marketing
The Biology Behind Eating

- Central Nervous System
  - Homeostatic system: hunger and satiety
  - Reward system: over-rides to produce food intake even in absence of hunger

- Peripheral Signals
  - Leptin from fat
  - GLP-1, GIP, PYY, OXM, from small intestine
  - Pancreatic polypeptide, amylin, insulin from pancreas
  - Ghrelin from stomach

GLP-1 = Glucogen-like peptide 1; GIP = Gastric inhibitory polypeptide;
PYY = Peptide YY; OXM = oxyntomodulin
## Risk of Associated Disease According to BMI and Waist Size

<table>
<thead>
<tr>
<th>BMI</th>
<th>Weight Classification</th>
<th>Waist ≤ 40” in men or 35” in women</th>
<th>Waist &gt; 40” in men or 35” in women</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.5 or less</td>
<td>Underweight</td>
<td>--</td>
<td>N/A</td>
</tr>
<tr>
<td>18.5 - 24.9</td>
<td>Normal</td>
<td>--</td>
<td>N/A</td>
</tr>
<tr>
<td>25.0 - 29.9</td>
<td>Overweight</td>
<td>Increased</td>
<td>High</td>
</tr>
<tr>
<td>30.0 - 34.9</td>
<td>Obese</td>
<td>High</td>
<td>Very High</td>
</tr>
<tr>
<td>35.0 - 39.9</td>
<td>Obese</td>
<td>Very High</td>
<td>Very High</td>
</tr>
<tr>
<td>40 or greater</td>
<td>Extremely Obese</td>
<td>Extremely High</td>
<td>Extremely High</td>
</tr>
</tbody>
</table>
Abdominal Fat Distribution Increases the Risk of Coronary Heart Disease

The Iowa Women’s Health Study

Body Mass Index Tertile

Relative Risk

Waist-Hip Ratio Tertile

A normal waist to hip ratio >0.95 for men and 0.86 for women

“Apple” vs. “Pear”

Android=Abdominal=
Central=Apple shaped

Gynecoid=Peripheral=
Pear shaped

Above the waist

Below the waist
Obesity-Related Health Problems

Metabolic effects

- **Endocrine**: Prediabetes and type 2 diabetes, dyslipidemia (low HDL and high triglycerides)
- **Cardiovascular**: HT, CAD, stroke, CHF, AF, venous stasis, DVT, PE
- **Cancer**: Multiple types, most commonly colorectal, postmenopausal breast, and endometrial
- **Gastrointestinal**: GERD, cholelithiasis, nonalcoholic fatty liver disease, nonalcoholic steatohepatitis
- **Renal**: Nephrolithiasis, proteinuria, chronic kidney disease
- **Genitourinary**:
  - In women, urinary stress incontinence, polycystic ovarian syndrome, infertility, pregnancy complications
  - In men, benign prostatic hypertrophy, erectile dysfunction
- **Neurologic**: Migraine, pseudotumor cerebri
- **Infections**: Greater severity of influenza with severe obesity, skin and soft tissue infections
Obesity-Related Health Problems

Mechanical effects

▪ Pulmonary: OSA, pulmonary hypertension, restrictive lung disease, chronic hypoxemic respiratory failure
▪ Musculoskeletal: osteoarthritis, low back pain

Psychosocial effects

▪ Depression and anxiety
▪ Social stigmatization
Evaluate for Weight Related Complications at each visit

2013 AHA/ACC/TOS Guidelines and ACE Guidelines

- Measure obesity-associated health risks
  - Glucose, A1c
  - Blood pressure
  - Lipids
  - Biomechanical problems, joint pain
  - Sleep apnea
  - Depression
  - Cancer history

Being overweight can lead to high blood pressure and related complications

- Stroke
- Blood vessel damage (arteriosclerosis)
- Heart attack or heart failure
- Kidney failure


AHA, American Heart Association
ACC, American College of Cardiology
TOS, The Obesity Society
Evaluate and Measure Weight-related Health Risk in Patients

2013 AHA/ACC/TOS Guidelines

- Screen all patients with BMI at least annually and more frequently, depending on risk factors
- Use **waist circumference** measure as a risk factor
- Identify high risk patients who need to lose weight
  - BMI ≥30 kg/m²
  - BMI ≥25 kg/m² with at least one risk factor
    - ↑ waist circumference (≥40 inches in men, ≥35 inches in women)

Case Study - Liz

- 44 year old female 5’2” and 199 lbs with BMI of 36 and 36” waist with hyperlipidemia (total cholesterol 220, LDL 154), fatty liver (AST 45, ALT 48) and prediabetes (Hgb A1c 6.2%)

- Sedentary lifestyle as medical receptionist with no exercise

- Wants help losing weight

How do you approach this patient and where do you start?
Meaningful Weight Loss is Goal

<table>
<thead>
<tr>
<th>Weight Loss (%)</th>
<th>Improvements in glycemic parameters, reduction of risk for developing diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3.0%</td>
<td>Greater improvements in glycemic parameters; improvement in blood pressure, HDL, and triglycerides Improve markers of NAFLD Urinary incontinence improves</td>
</tr>
<tr>
<td>-5.0%</td>
<td>Greater improvements in above parameters Improve symptoms of sleep apnea</td>
</tr>
<tr>
<td>-10.0%</td>
<td>Even greater improvements in above parameters</td>
</tr>
</tbody>
</table>

NAFLD = Nonalcoholic Fatty Liver Disease

Counsel Patients on Lifestyle Modifications

With or without obesity-related CV factors (NIH, AHA, ACCF, ADA)

Patient success linked to provider suggestions!!!

- Prescribe a diet
  - To achieve reduced caloric intake
  - Refer to professional or evidence-based program
- Increase physical activity
- Lifestyle intervention program

NIH, National Institute of Health; AHA, American Heart Association
ACCF, The American College of Cardiology Foundation; ADA, American Diabetes Association

Components of an Effective Obesity Management Program

How Much Weight Does the State-of-the-Art Lifestyle Intervention Produce?

Mean weight loss (%) from baseline by year

% Weight change

Year 0
0.00

Year 1
-0.63

Year 2
-0.93

Year 3
-0.92

Year 4
-1.01

Mean weight loss (%)

-8.5

-6.35

-5.04

-4.66

Diabetes support and education
ILI, Intensive lifestyle intervention

P<.0001

“Diet” vs “Lifestyle Change”

- Diets are thought of as temporary – lifestyle changes are long term – “forever”
- Reduce caloric intake 500-750 kcal/day – (take into consideration output - if caloric input exceeds output weight gain will occur)
- Commercial programs (eg. Jenny Craig, WW, Nutrisystem) can produce weight loss
- Detox/Cleanses/Weight Loss Supplements – Not FDA vetted/approved – often contain some sort of stimulant (caffeine derivative), effects often short term
- With regards to weight loss – no diet has been proven superior to others
- With regards to health – specific dietary patterns have good evidence for primary and secondary prevention of several chronic diseases
  - Prevention of cardiovascular disease, cancer, type 2 diabetes mellitus, and obesity
  - Mediterranean diet, the Dietary Approaches to Stop Hypertension diet (DASH), the 2015 Dietary Guidelines for Americans, and the Healthy Eating Plate

The Mediterranean Diet

▪ Not a specific diet but rather recommendations based on observations of what people eat that live in the regions surrounding the Mediterranean Sea

▪ The main components of Mediterranean diet include:
  ▪ Daily consumption of vegetables, fruits, whole grains and healthy fats (i.e., olive oil)
  ▪ Weekly intake of fish, poultry, beans and eggs
  ▪ Moderate portions of dairy products (Greek yogurt)
  ▪ Limited intake of red meat
  ▪ Red wine in moderation (risks vs benefits…)

[Image of Mediterranean food]
Intermittent Fasting

- Based on timed periods of little/no caloric intake (without reducing vital nutrients)
- Triggers the body to shift from utilizing glucose in the liver for energy to ketones stored in fat - “ketogenesis”
- Ketogenesis – reduces oxidative/metabolic stress and promotes/enhances cellular repair/healing
- Short term studies demonstrate improvements in obesity, diabetes, cardiovascular disease, cancers and neurological disorders. Long term (longevity outcomes) not known
- Examples:
  - Alternate day fasting, 5:2 intermittent fasting (fasting two days each week)
  - Daily time-restricted feeding (such as eating only during a six-hour window)

## Implementing Intermittent Fasting

<table>
<thead>
<tr>
<th>Month</th>
<th>Time-Restricted Feeding</th>
<th>5:2 Intermittent Fasting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month 1</td>
<td>10 hour feeding period 5 days/week</td>
<td>1000 calories 1 day/week</td>
</tr>
<tr>
<td>Month 2</td>
<td>8 hour feeding period 5 days/week</td>
<td>1000 calories 2 days/week</td>
</tr>
<tr>
<td>Month 3</td>
<td>6 hour feeding period 5 days/week</td>
<td>750 calories 2 days/week</td>
</tr>
<tr>
<td>Month 4 (goal)</td>
<td>6 hour feeding period 7 days/week</td>
<td>500 calories 2 days/week</td>
</tr>
</tbody>
</table>

Diet Composition Comparison: Weight Change From Baseline

Exercise – Move your body!

- The best form of exercise . . . Is the one you will do!!
- Exercise can help with weight loss as well as help maintain weight loss
- Increases metabolism = more calories burned per day
- Increases muscle/lean body mass
- Increases insulin sensitivity
- Releases endorphins
- Combined with diet – more effective for weight loss then either independently
Exercise Recommendations

▪ For General Health
  ▪ Moderate intensity physical activity or equivalent*
    ▪ 150 minutes/week
  ▪ Resistance training
    ▪ Moderate or high intensity
    ▪ 2 or more days a week

▪ Weight Loss and Maintenance
  ▪ 150 to 250 minutes per week moderate intensity
  ▪ 250 minutes or more per week for maintenance

*Defined as activities that are strenuous enough to burn three to six times as much energy per minute as an individual would burn when sitting quietly, or 3 to 6 METs (metabolic equivalents). Vigorous-intensity activities burn more than 6 METs.
Case Study - Liz

- 44 year old female with BMI of 36 and 36” waist with hyperlipidemia, fatty liver, and prediabetes
- Sedentary lifestyle as medical receptionist with no exercise
- Wants help losing weight
- After 6 months with Jenny Craig and walking 2 miles 4 x per week:
  - 8 lb weight loss now 191 and BMI of 35, waist 35”
  - Total Cholesterol 202, LDL 138, AST/ALT now normal, hgb A1c 5.9%

She feels frustrated, was hoping for more weight loss.

Additional history: Has 2 children (s/p BTL), told she has gallstones, takes Tramadol 50mg BID for chronic spinal stenosis of lumbar spine.

What is your next step?
Efficacy and Safety of Currently Available Treatments


Perioperative DVT, thromboembolism or death
1% for gastric band
5% for bypass

Weight loss at 3 years
16% for gastric band
33% for bypass

Lifestyle
Gastric Band
Gastric Bypass
Meds + Lifestyle
VLCD
0% 5% 10% 15% 20% 25% 30% 35% Weight Loss
Meds Don’t Work on Their Own
Important to Use Medication as an Adjunct to Lifestyle Counseling

- Lifestyle-modification alone
- Combined therapy

Mean weight loss, kg
N=224
- Sibutramine alone: 5.0 ± 7.4
- Lifestyle-modification alone: 6.7 ± 7.9
- Sibutramine + brief therapy: 7.5 ± 8.0
- Combined therapy: 12.1 ± 9.8

Why Do We Need Medication for Weight Loss?

Address some pathophysiological problems

- Adherence to healthy eating plan
- Achieve meaningful weight loss
- Produce more weight loss – greater health benefits
- Early weight loss = more success
- Sustain weight loss
What can weight loss medications do?

- Help struggling patients achieve health benefits
- Serve as adjunct to lifestyle modifications
- Achieve greater meaningful weight loss
- Achieve weight loss early to promote long-term success
# Pharmacotherapies

<table>
<thead>
<tr>
<th>Agents</th>
<th>Action</th>
<th>Approval, Availability</th>
</tr>
</thead>
</table>
| Phentermine (Adipex-P) | • Central noradrenergic agent  
  • Schedule II–IV | • Approved, 1959  
  • #1 seller in US  
  • 3-month prescribing limit |
| Orlistat (Xenical; Alli) | • Peripheral pancreatic lipase inhibitor  
  • Blocks fat absorption  
  • Not scheduled | • Approved, 1999  
  • Available in US, EU  
  • Available OTC or prescription |

**Agents** | **Action** | **Approval, Availability**
--- | --- | ---
Lorcaserin (Belviq, Belviq XR) | • 5-HT\(_{2C}\) serotonin agonist  
• Little affinity for other serotonergic receptors | • Approved, summer 2012  
• Recalled February 2020 – due to increased cancer risk (pancreatic, colorectal, and lung)

Phentermine/Topiramate ER (Qsymia) | • Sympathomimetic  
• Anticonvulsant (GABA receptor modulation, carbonic anhydrase inhibition, glutamate antagonism) | • Approved, summer 2012

### Pharmacotherapies

**continued**

<table>
<thead>
<tr>
<th>Agents</th>
<th>Action</th>
<th>Approval, Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naltrexone HCl/ Bupropion HCl</td>
<td>• Opioid antagonist&lt;br&gt;• Neuronal reuptake inhibitor of dopamine and norepinephrine</td>
<td>• Approved, September 2014</td>
</tr>
<tr>
<td>(Contrave)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liraglutide 3 mg (Saxenda)</td>
<td>• GLP-1 Receptor agonist&lt;br&gt;• Augments insulin secretion during hyperglycemia, suppresses appetite, and delays gastric emptying</td>
<td>• FDA-approved in 2010 for diabetes (1.8 mg/day)&lt;br&gt;• FDA AdCom voted 14-1 in favor of approval of high-dose (3.0 mg/day) for obesity on September 11, 2014&lt;br&gt;• Approved, December 2014</td>
</tr>
</tbody>
</table>
Phentermine/Topiramate ER

- Initially titrate: 3.75/23 mg → 7.5/46 mg
  - Option to escalate to 15/92 mg with low weight loss response
- Contraindications
  - Pregnancy
  - Glaucoma
  - Hyperthyroidism
  - Monoamine oxidase inhibitors
Effect of Phentermine/Topiramate Extended Release on Weight Loss in Obese Adults Over 2 Years: SEQUEL


Results are for the completer population; presented as least-squares mean (95% CI). Data to the right are for the ITT LOCF population.

PHEN/TPM ER = phentermine/topiramate combination therapy
ITT = intent to treat
LOCF = last observation carried forward
Orlistat

Indications and Dose
Approved by FDA, 1999
- Approved in adolescents
- Dosing:
  - Rx: 120 mg TID with each meal
  - OTC: 60 mg TID with each meal
- Advise patients:
  - Nutritionally balanced, reduced-calorie diet; approximately 30% of calories from fat
  - Take a multivitamin containing fat-soluble vitamins at bedtime

Contraindications and Warnings
- Contraindications:
  - Pregnancy, chronic malabsorption syndrome, cholestasis
- Warnings:
  - Decrease cyclosporine exposure, rare cases of severe liver injury, increased levels of urinary oxalate
  - GI AEs: oily spotting, flatus with discharge, fecal urgency, fatty/oily stool, oily evacuation, increased defecation and fecal incontinence

Naltrexone HCL/Bupropion HCL

Use

- Dose escalation required up to 4 week period
- Bupropion, antidepressant (Wellbutrin), requires monitoring for worsening and emergence of suicidal thoughts
- Contraindicated in uncontrolled HTN, seizures, chronic opioid use, and pregnancy

Light Study

- Nearly 9,000 overweight/obese patients with CVD risk factors
- Rule out excess cardiovascular risk in overweight and obese receiving NB
- Interim analysis found no differences in SBP, DBP, Heart rate
Naltrexone SR/Bupropion SR
Body Weight Change

**Liraglutide**

- Daily injectable
- 3 mg dose (1.8 mg used in type 2 diabetes)
- Potential risk of medullary thyroid carcinoma (MTC)
- Pancreatitis risk
- Gallbladder risk
- Main side effects: nausea, vomiting
Scale Liraglutide Maintenance Study

Liraglutide with Diet/Exercise at 2 years

<table>
<thead>
<tr>
<th>Adverse Events, %</th>
<th>Placebo (n=98)</th>
<th>Liraglutide 3.0 (n=93)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constipation</td>
<td>12.2</td>
<td>18.3</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>10.2</td>
<td>15.1</td>
</tr>
<tr>
<td>Dyspepsia</td>
<td>3.1</td>
<td>8.6</td>
</tr>
<tr>
<td>Nausea</td>
<td>7.1</td>
<td>48.4</td>
</tr>
<tr>
<td>Vomiting</td>
<td>2.0</td>
<td>12.9</td>
</tr>
<tr>
<td>Psychiatric</td>
<td>5.1</td>
<td>12.9</td>
</tr>
</tbody>
</table>

Liraglutide 2.4/3.0, liraglutide 2.4 mg and 3.0 mg pooled

Reducing Body Weight by % Categories at 1 Year with Adjunctive Medication Among those who Complete Treatment*

*Combined with lifestyle modification; data are from largest Phase III trial
# Medications: Side Effects and Considerations

<table>
<thead>
<tr>
<th>Trial</th>
<th>Most Common Side Effects</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phentermine-Topiramate ER</strong></td>
<td>Dry mouth 13.5%</td>
<td>MAOIs: Acute Myopia and Secondary Angle Closure Glaucoma, hyperthyroidism, oxalate kidney stones, teratogenic</td>
</tr>
<tr>
<td></td>
<td>Tingling 13.7%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Constipation 15.1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Altered taste 7.4%</td>
<td></td>
</tr>
<tr>
<td><strong>Orlistat</strong></td>
<td>Oily Spotting Yr 1: 26.6% Yr 2: 4.4%</td>
<td>Pregnancy, chronic malabsorption, cholestasis, known hypersensitivity reaction</td>
</tr>
<tr>
<td></td>
<td>Flatus with Discharge 23.9%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fecal Urgency 22.1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fatty/Oily Stool 20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oily Evacuation 11.9%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increased Defecation 10.8%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fecal Incontinence 7.7%</td>
<td></td>
</tr>
<tr>
<td><strong>Bupropion-Naltrexone</strong></td>
<td>Nausea 32.5%</td>
<td>MAOIs; Seizure disorders, chronic opioid use, suicidal thinking, anorexia nervosa or bulimia, other bupropion-containing products</td>
</tr>
<tr>
<td></td>
<td>Constipation 19.2%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Headache 17.6%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vomiting 10.7%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dizziness 9.9%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Insomnia 9.2%</td>
<td></td>
</tr>
<tr>
<td><strong>Liraglutide</strong></td>
<td>Nausea 39.3%</td>
<td>Potential risk of medullary thyroid carcinoma (MTC), pancreatitis, gall bladder disease</td>
</tr>
<tr>
<td></td>
<td>Diarrhea 20.9%</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Headache 13.6%</td>
<td></td>
</tr>
</tbody>
</table>

Case Study - Liz

- **Diet:** Continue with current membership with Jenny Craig or consider intermittent fasting?
  - Depending on intake may need to increase?

- **Exercise:** 2 miles 4x/week on average = 120-160 min/week

- **Medication:**
  - Orlistat Y/N
  - Naltrexone/Bupropion Y/N
  - Phentermine/Topiramate Y/N
  - Liraglutide Y/N

*Surgery???*
Role of Bariatric Surgery in Obesity and Associated Metabolic Conditions

- Studies show that bariatric surgery causes significant weight loss and is more effective at improving diabetes in the short term (up to 2 years) than nonsurgical interventions (diet, exercise, other behavioral interventions, and medications).

- Diabetes improvement starts rapidly after surgery, before significant weight loss has occurred.

- The mechanism for postoperative metabolic improvements has not been fully elucidated and may be, in part, independent of weight loss.

Indications are consensus based and vary between organizations. All agree to consider surgery on patients with a BMI ≥ 40 or more than 100 pounds to lose or a BMI ≥ 35 and other significant co-morbidities.

Other possible indications include:

- Patients who have failed other attempts to maintain a healthy weight
- Lower weight patients with uncontrolled T2D
Is the Patient a Surgical Candidate?

Beyond meeting NIH/insurance criteria, is the patient...

- Motivated to change?
- Demonstrating change, already?
- Aware of the post-surgical requirements *(diet/exercise/vitamins)*?
- Able to keep post-bariatric visits?
- Capable of understanding the process?
- Able to afford the required food & vitamins?
Improvement of Comorbidities

- Weight loss surgery reliably induces rapid, marked, and durable weight loss among obese patients.
- Reduces the burden of multiple obesity-associated comorbidities including diabetes, OSA, cardiovascular disease including hypertension, stroke, coronary artery disease and heart failure.
- May protect against malignancy.
Improved Survival with
Weight Loss Surgery

- Weight loss surgery patients were prospectively matched to a control group of 2,037 patients who underwent standard medical therapy, the risk-adjusted hazard ratio for mortality was 0.71 after a mean follow up of 10.9 years.

- A retrospective analysis that matched 2,500 weight loss surgery patients to 7,462 matched controls in the United States Veterans Affairs system found that surgical patients had significantly decreased mortality after one year of follow up, with a hazard ratio of 0.47 after 5 years.


Common Bariatric or Weight Loss Surgeries (WLS)

- Adjustable Gastric Band (AGB)
- Roux-en-Y Gastric Bypass (RYGB)
- Vertical Sleeve Gastrectomy (VSG)

Adapted from an illustration by Walter Pories, MD, FACS
Follow Up on WLS Patients

- At 6 months post expect
  - ~30-40% Excess Body Weight (EBW) loss
- At 12 months post expect
  - RYGB: 55-70%
  - Sleeve: 45-60%
Follow Up on WLS Patients

- **Diet: General composition guidelines**
  - 70 - 80 gm of protein

- **Protein > vegetables > fruit > carbs**
  - 64 oz of water/equivalents
  - No carbonation
  - Avoid: bread/rice/pasta
  - Avoid sweetened beverages
Obesity in Children

- Growing global health issue (especially in US and other developed countries)
- No clear cut recommendations on approach to treatment
- Societal barriers (socioeconomics, cultural, environmental)
- No FDA approved medications for children
- Pediatric Obesity Algorithm originally sponsored by Obesity Medical Association in 2016 to try to address this care gap and uncertainty. Available online at: www.Pediatricobesityalgorithm.org
- Identifying and classifying these children as early as possible is important, as is identifying comorbid conditions
Non-Hispanic blacks (49.6%) had the highest age-adjusted prevalence of obesity, followed by Hispanics (44.8%), non-Hispanic whites (42.2%) and non-Hispanic Asians (17.4%)

1Significantly different from all other race and Hispanic-origin groups.
2Significantly different from men for same race and Hispanic-origin group.
NOTES: Estimates were age adjusted by the direct method to the 2000 U.S. Census population using the age groups 20–39, 40–59, and 60 and over.

https://www.cdc.gov/nchs/data/databriefs/db360_tables-508.pdf#page=2
Obesity in Pregnancy

- Increased risk for:
  - Miscarriage
  - Gestational Diabetes
  - Macrosomia
  - Preeclampsia
  - Birth defects - babies born to obese women have an increased risk of having birth defects, such as heart defects and neural tube defects
  - Stillbirth - the higher the woman’s BMI, the greater the risk of stillbirth

Source: https://www.acog.org/patient-resources/faqs/pregnancy/obesity-and-pregnancy
Summary

- Obesity is endemic in the US & the world, and the prevalence is growing.
- It is easy to diagnose, easy to stigmatize, and difficult to treat.
- Obesity is a chronic medical condition requiring ongoing care.
- Associated with multiple serious health risks.
- Multi-disciplinary approach of diet, exercise, and lifestyle changes remain the backbone of therapy. Close follow-up improves outcomes.
Summary

- Consider implementing medications earlier as indicated
- More serious cases need more serious intervention
- Even modest weight loss can significantly affect morbidity and impact on medical outcomes

Early Intervention! Don’t wait until BMI of 30 to start the discussion with your patients.