### Patient Presentation

Screen positive for overweight or obesity
BMI $\geq 25$ kg/m$^2$ ($\geq 23$ kg/m$^2$ in some ethnicities)

Presence of weight-related disease or complication that could be improved by weight loss therapy

### Evaluation

- Medical history
- Physical examination
- Clinical laboratory
- Review of systems, emphasizing weight-related complications
- Obesity history: graph weight vs age, lifestyle patterns/preferences, previous interventions

- Confirm that elevated BMI represents excess adiposity
- Measure waist circumference to evaluate cardiometabolic disease risk

### Anthropometric Diagnosis

<table>
<thead>
<tr>
<th>BMI $\text{kg/m}^2$</th>
<th>STAGE 0</th>
<th>STAGE 1</th>
<th>STAGE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>$&lt;25$</td>
<td>None</td>
<td>Mild to Moderate</td>
<td>Severe</td>
</tr>
<tr>
<td>$25–29.9$ overweight</td>
<td>One or more mild-to-moderate complications or may be treated effectively with moderate weight loss</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\geq 30$ obesity</td>
<td>At least one severe complication or requires more aggressive weight loss for effective treatment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Clinical Diagnosis

- Waist circumference below regional/ethnic cutoffs

### Diagnostic Categories

- **NORMAL WEIGHT** (no obesity)
- **OVERWEIGHT** BMI 25–29.9
- **OBESITY** BMI $\geq 30$

### Phases of Chronic Disease Prevention and Treatment Goals

- **PRIMARY** Prevent overweight/obesity
- **SECONDARY** Prevent progressive weight gain or achieve weight loss to prevent complications
- **TERTIARY** Achieve weight loss sufficient to ameliorate the complications and prevent further deterioration

### Treatment Based on Clinical Judgment

- **PRIMARY**
  - Healthy meal plan
  - Physical activity
  - Health education
  - Built environment

- **SECONDARY**
  - Lifestyle/behavioral therapy
  - Consider pharmacotherapy if lifestyle alone not effective

- **TERTIARY**
  - Lifestyle/behavioral therapy
  - Consider pharmacotherapy (BMI $\geq 27$)

- **TERTIARY**
  - Lifestyle/behavioral therapy
  - Add pharmacotherapy (BMI $\geq 27$)
  - Consider bariatric surgery (BMI $\geq 35$)

### Follow-Up

- Once the plateau for weight loss has been achieved, re-evaluate the weight-related complications. If the complications have not been treated to target, then weight loss therapy should be intensified or complication-specific interventions need to be employed.
- Obesity is a chronic disease and the diagnostic categories for obesity may not be static. Therefore, patients require ongoing follow-up, re-evaluation, and long-term treatment.

**Abbreviation:** BMI = body mass index
ANTHROPOMETRIC COMPONENT OF THE MEDICAL DIAGNOSIS OF OBESITY
Evidence-based screening and diagnosis for excess adiposity in clinical settings

1. Clinical interpretation of BMI: Ensure elevated BMI is indicative of excess adiposity by assessing: age, gender, muscularity, hydration status, edema, third space fluid collection, large tumors, sarcopenia
2. Waist circumference if BMI <35: Adds information pertaining to cardiometabolic disease risk; use gender- and ethnicity-specific cut-off values
3. Can consider body composition technologies: eg, bioelectrical impedance, air/water displacement plethysmography, or dual-energy x-ray absorptiometry scan

Clinical Component of Diagnosis

CLINICAL COMPONENT OF THE MEDICAL DIAGNOSIS OF OBESITY
Evaluate for a checklist of weight-related complications. Candidates for weight-loss therapy can present with either excess adiposity (ie, the anthropometric component) or weight-related complications (ie, the clinical component)

Patients Present with Overweight or Obesity (Anthropometric Component)
Patients present with BMI ≥25 kg/m², or ≥23 kg/m² in certain ethnicities, and excess adiposity

Candidates for Weight Loss Therapy
Evaluate for weight-related complications

Patients Present with Weight-Related Disease or Complication (Clinical Component)
Prediabetes
Metabolic Syndrome
Type 2 Diabetes
Dyslipidemia
Hypertension
Cardiovascular Disease
Nonalcoholic Fatty Liver Disease
Polycystic Ovary Syndrome
Female Infertility
Male Hypogonadism
Obstructive Sleep Apnea
Asthma/Reactive Airway Disease
Osteoarthritis
Urinary Stress Incontinence
Gastroesophageal Reflux Disease
Depression

Abbreviation: BMI = body mass index.
# CHECKLIST OF WEIGHT-RELATED COMPLICATIONS: SCREENING AND DIAGNOSES IN PATIENTS WITH OVERWEIGHT/OBESITY

<table>
<thead>
<tr>
<th>Weight-Related Complication</th>
<th>Basis for Screening and/or Diagnosis</th>
<th>Suggested Secondary Testing When Needed To Confirm Diagnosis, Stage Severity, or Guide Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prediabetes</td>
<td>Fasting glucose; A1C; 2-hour OGTT glucose</td>
<td>If fasting glucose is 100-125 mg/dL, a repeat elevated fasting glucose completes diagnosis of IFG; however, 2-hour OGTT should also be performed to exclude diabetes and IGT. Fasting and 2-hour OGTT should be performed if initial fasting glucose is normal and A1C is elevated, or in high-risk patients based on family history or metabolic syndrome.</td>
</tr>
<tr>
<td>Metabolic Syndrome</td>
<td>Waist circumference, blood pressure, fasting glucose, triglycerides, HDL-c</td>
<td>Initial evaluation completes diagnosis; OGTT to test for IGT or diabetes.</td>
</tr>
<tr>
<td>Type 2 Diabetes</td>
<td>Fasting glucose; A1C; 2-hour OGTT glucose; symptoms of hyperglycemia</td>
<td>Overtly elevated (i.e., ≥200 mg/dL) or a repeat fasting glucose ≥126 mg/dL completes diagnosis. If fasting glucose and/or A1C is consistent with prediabetes, 2-hour OGTT should be performed to test for diabetes. A1C should be performed to help guide therapy.</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>Lipid panel (total cholesterol, HDL-c, triglycerides, LDL-c, non-HDL-c)</td>
<td>Lipid panel completes diagnosis; lipoprotein subclasses, Apo B-100 may further define risk.</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Sitting blood pressure</td>
<td>Repeat elevated blood pressure measurements to complete diagnosis; home blood pressure or ambulatory blood pressure monitoring may help complete testing.</td>
</tr>
<tr>
<td>Cardiovascular Disease</td>
<td>Physical exam; ROS; history and medical records</td>
<td>Additional testing based on findings and risk status (eg, ankle-brachial index, stress testing, coronary artery calcium score and the MESA risk score calculator, arteriography, carotid ultrasound)</td>
</tr>
<tr>
<td>NAFLD/NASH</td>
<td>Physical exam; LFTs</td>
<td>Imaging (eg, ultrasound, MRI, elastography) and/or liver biopsy needed to complete diagnosis.</td>
</tr>
<tr>
<td>PCOS and Female Infertility</td>
<td>Physical exam; ROS; menstrual and reproductive history</td>
<td>Hormonal testing (eg, androgen levels, SHBG, LH/FSH, estradiol), ovulation testing, imaging of ovaries, may be needed to complete diagnosis.</td>
</tr>
<tr>
<td>Male Hypogonadism</td>
<td>Physical exam; ROS</td>
<td>Hormonal testing (total and free testosterone, SHBG, LH/FSH, prolactin) as needed to complete diagnosis.</td>
</tr>
<tr>
<td>Obstructive Sleep Apnea</td>
<td>Physical exam; neck circumference; ROS</td>
<td>Polysomnography needed to complete diagnosis.</td>
</tr>
<tr>
<td>Asthma / Respiratory Disease</td>
<td>Physical exam; ROS</td>
<td>Chest x-ray and spirometry study may be needed to complete diagnosis.</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>Physical exam; ROS</td>
<td>Radiographic imaging may be needed to complete diagnosis.</td>
</tr>
<tr>
<td>Urinary Stress Incontinence</td>
<td>Physical exam; ROS</td>
<td>Urine culture, urodynamic testing may be needed to complete diagnosis.</td>
</tr>
<tr>
<td>GERD</td>
<td>Physical exam; ROS</td>
<td>Endoscopy, esophageal motility study may be needed to complete diagnosis.</td>
</tr>
<tr>
<td>Depression, Anxiety, Binge Eating Disorder, Stigmatization</td>
<td>History; ROS</td>
<td>Screening/diagnostic evaluation or questionnaires based on criteria in Diagnostic and Statistical Manual of Mental Disorders; referral to clinical psychologist or psychiatrist.</td>
</tr>
<tr>
<td>Disability</td>
<td>Physical exam; ROS</td>
<td>Functional testing may be helpful.</td>
</tr>
<tr>
<td>Additional Evaluation Relevant to the Differential Diagnosis of Obesity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Interpretation of BMI**  
Physical exam to ensure that BMI value is indicative of excess adiposity  
Assess muscularity, edema, volume status, pregnancy, third space fluid accumulation, sarcopenia, large tumors, lipodystrophy, etc. Bioelectric impedance, air/water displacement plethysmography, or dual-energy absorptiometry scan may be considered.

**Obesity Secondary to Hormonal Disorder**  
Physical exam; ROS  
TSH for suspected hypothyroidism; salivary/serum/urine cortisol for hypercortisolism if clinical findings or symptoms present.

**Iatrogenic Obesity (e.g., secondary to medications)**  
Review current medications and medication history  
Follow-up following withdrawal of offending medication and/or substitution with weight-neutral alternative may be needed to complete diagnosis.

**Genetic Syndrome**  
Physical exam; ROS; family history  
If clinical findings are suggestive, genetic testing of patient and perhaps family members may be needed to complete diagnosis.

**Abbreviations:** A1C = glycated hemoglobin; BMI = body mass index; FSH = follicle-stimulating hormone; GERD = gastroesophageal reflux disease; HDL-c = high-density lipoprotein cholesterol; IFG = impaired fasting glucose; IGT = impaired glucose tolerance; LFTs = liver function tests; LDL-c = low-density lipoprotein cholesterol; LH = luteinizing hormone; MRI = magnetic resonance imaging; NAFLD = non-alcoholic fatty liver disease; NASH = non-alcoholic steatohepatitis; OGTT = oral glucose tolerance test; PCOS = polycystic ovarian syndrome; ROS = review of symptoms; SHBG = sex hormone binding globulin; TSH = thyroid-stimulating hormone.
### LIFESTYLE THERAPY

Evidence-based lifestyle therapy for treatment of obesity should include three components:

<table>
<thead>
<tr>
<th>MEAL PLAN</th>
<th>PHYSICAL ACTIVITY</th>
<th>BEHAVIOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Reduced-calorie healthy meal plan</td>
<td>* Voluntary aerobic physical activity progressing to &gt;150 minutes/week performed on 3–5 separate days per week</td>
<td>An interventional package that includes any number of the following:</td>
</tr>
<tr>
<td>* ~500–750 kcal daily deficit</td>
<td>* Resistance exercise: single-set repetitions involving major muscle groups, 2–3 times per week</td>
<td>* Self-monitoring (food intake, exercise, weight)</td>
</tr>
<tr>
<td>* Individualize based on personal and cultural preferences</td>
<td>* Reduce sedentary behavior</td>
<td>* Goal setting</td>
</tr>
<tr>
<td>* Meal plans can include: Mediterranean, DASH, low-carb, low-fat, volumetric, high protein, vegetarian</td>
<td>* Individualize program based on preferences and take into account physical limitations</td>
<td>* Education (face-to-face meetings, group sessions, remote technologies)</td>
</tr>
<tr>
<td>* Meal replacements</td>
<td>Team member or expertise: exercise trainer, physical activity coach, physical/occupational therapist</td>
<td>* Problem-solving strategies</td>
</tr>
<tr>
<td>* Very low-calorie diet is an option in selected patients and requires medical supervision</td>
<td></td>
<td>* Stimulus control</td>
</tr>
</tbody>
</table>

#### WHEN TO INITIATE WEIGHT-LOSS MEDICATIONS IN PATIENTS WITH OVERWEIGHT/OBESITY

<table>
<thead>
<tr>
<th>INITIATE LIFESTYLE THERAPY</th>
<th>INITIATE WEIGHT LOSS MEDICATION AS AN ADJUNCT TO LIFESTYLE THERAPY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. No Complications.</strong></td>
<td><strong>1. Failure on Lifestyle Therapy.</strong> Add medication for patients who have progressive weight gain or who have not achieved clinical improvement in weight-related complications on lifestyle therapy alone.</td>
</tr>
<tr>
<td>Patients with overweight or obesity who have no clinically significant weight-related complications (secondary prevention)</td>
<td><strong>2. Weight Regain on Lifestyle Therapy.</strong> Add medication for patients with overweight (BMI 27–29.9 kg/m²) or obesity who are experiencing weight regain following initial success on lifestyle therapy alone.</td>
</tr>
<tr>
<td><strong>2. Mild to Moderate Complications.</strong></td>
<td><strong>3. Presence of Weight-Related Complications.</strong> Initiate medication concurrent with lifestyle therapy for patients with overweight (BMI 27–29.9 kg/m²) or obesity who have weight-related complications, particularly if severe, in order to achieve sufficient weight loss to ameliorate the complication (tertiary prevention).</td>
</tr>
<tr>
<td>* Patient with mild to moderate weight-related complications when lifestyle therapy is anticipated to achieve sufficient weight loss to ameliorate the complication (tertiary prevention)</td>
<td></td>
</tr>
<tr>
<td>* Note: weight loss medications may also be indicated based on clinical judgment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Treatment Goals Based on Diagnosis in the Medical Management of Patients with Obesity

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Anthropometric Component</th>
<th>Clinical Component</th>
<th>Intervention/Weight-Loss Goal</th>
<th>Clinical Goals</th>
</tr>
</thead>
</table>
| **Primary Prevention** | Primordial Prevention | BMI ≤25 (≤23 in certain ethnicities) | Obesogenic environment | - Public education  
- Built environment  
- Access to healthy foods | Decreased incidence of overweight/obesity in populations |
| | Primary Prevention | BMI ≤25 (≤23 in certain ethnicities) | High-risk individuals or subgroups based on individual or cultural behaviors, ethnicity, family history, biomarkers, or genetics | - Annual BMI screening  
- Healthy meal plan  
- Increased physical activity | Decreased incidence of overweight/obesity in high-risk individuals or identifiable subgroups |
| **Secondary Prevention** | Overweight | BMI 25–29.9 (BMI 23–24.9 in certain ethnicities) | No clinically significant or detectable weight-related complications | - Prevent progressive weight gain or weight loss  
- Prevent progression to obesity  
- Prevent the development of weight-related complications |
| | Obesity | BMI ≥30 (≥25 in certain ethnicities) | No clinically significant or detectable weight-related complications | - Weight loss or prevent progressive weight gain | Prevent the development of weight-related complications |
| **Tertiary Prevention** | Overweight or Obesity | BMI ≥25 (≥23 in certain ethnicities) | Metabolic syndrome | Prevention of T2DM |
| | | | Prediabetes | Prevention of T2DM |
| | | | T2DM | 5% to 15% | - Reduction in A1C  
- Reduction in number and/or doses of glucose lowering medications  
- Diabetes remission especially when diabetes duration is short |
| | | | Dyslipidemia | 5% to 15% | - Lower triglycerides  
- Raise HDL-c  
- Lower non-HDL-c |
| | | | Hypertension | 5% to 15% | - Lower systolic and diastolic BP  
- Reductions in number and/or doses of antihypertensive medications |
| | | | Nonalcoholic fatty liver disease | Steatosis | 5% or more | Reduction in intrahepatocellular lipid |
| | | | | Steatohepatitis | 10% to 40% | Reduction in inflammation and fibrosis |
| | | | Polycystic ovary syndrome | 5% to 15% or more | - Ovulation  
- Regularization of menses  
- Reduced hirsuitism  
- Enhanced insulin sensitivity  
- Reduced serum androgen levels |
| | | | Female infertility | 10% or more | - Ovulation  
- Pregnancy and live birth |
| | | | Male hypogonadism | 5% to 10% or more | Increase in serum testosterone |
| | | | Obstructive sleep apnea | 7% to 11% or more | - Improved symptomatology  
- Decreased apnea-hypopnea index |
| | | | Asthma/reactive airway disease | 7% to 8% or more | - Improvement in forced expiratory volume at 1 second  
- Improved symptomatology |
| | | | Osteoarthritis | ≥10%  
5% to 10% or more when coupled with exercise | - Improvement in symptomatology  
- Increased function |
| | | | Urinary stress incontinence | 5% to 10% or more | Reduced frequency of incontinence episodes |
| | | | Gastroesophageal reflux disease | 10% or more | Reduced symptom frequency and severity |
| | | | Depression | Uncertain | - Reduction in depression symptomatology  
- Improvement in depression scores |

**Abbreviations:** A1C = hemoglobin A1c; BMI = body mass index; BP = blood pressure; HDL-c = high-density lipoprotein cholesterol; T2DM = type 2 diabetes mellitus.
### PREFERRED WEIGHT-LOSS MEDICATIONS: INDIVIDUALIZATION OF THERAPY

<table>
<thead>
<tr>
<th>CLINICAL CHARACTERISTICS OR COEXISTING DISEASES</th>
<th>MEDICATIONS FOR CHRONIC WEIGHT MANAGEMENT</th>
</tr>
</thead>
</table>
| **Diabetes Prevention** (metabolic syndrome, prediabetes) | Orlistat: Insufficient data for T2DM prevention  
Lorcaserin: Insufficient data for T2DM prevention  
Phentermine/topiramate ER: Insufficient data for T2DM prevention  
Naltrexone ER/bupropion ER: Insufficient data  
Liraglutide 3 mg: Insufficient data  |
| **Type 2 Diabetes Mellitus** |  |
| **Hypertension** | Monitor heart rate: Monitor heart rate  
Monitor BP and heart rate: Monitor heart rate  
Contraindicated in uncontrolled HTN: Monitor heart rate |
| **Cardiovascular Disease** | CAD: Monitor heart rate  
Arrhythmia: Monitor for bradycardia  
CHF: Insufficient data  |
| **Chronic Kidney Disease** | Mild (<50–79 mL/min): Insufficient data  
Moderate (30–49 mL/min): Insufficient data  
Severe (<30 mL/min): Insufficient data  |
| **Nephrolithiasis** | Calcium oxalate stones  
Calcium phosphate stones |
| **Hepatic Impairment** | Mild-Moderate (Child-Pugh 5–9): Insufficient data  
Severe (Child-Pugh >9): Insufficient data  |
| **Depression** | Insufficient safety data  
Avoid maximum dose: 15 mg/92 mg per day  
Insufficient safety data  
Avoid in adolescents and young adults |
| **Anxiety** | Insufficient data  
Avoid max dose: 15 mg/92 mg per day |
| **Psychoses** | Insufficient data  
Insufficient data  
Insufficient data  
Insufficient data |
| **Binge Eating Disorder** | Insufficient data. Possible benefit based on reduction in food cravings: Insufficient data. Possible benefit based on studies with topiramate  
Insufficient data. Possible benefit based on studies with bupropion  
Insufficient data  |
| **Glaucoma** | Contraindicated, may trigger angle closure  
May trigger angle closure |
| **Seizure Disorder** | If discontinue at dose of 15 mg/92 mg, taper slowly  
Bupropion lowers seizure threshold |
| **Pancreatitis** | Monitor for symptoms |
| **Opioid Use** | Will antagonize opioids and opiates  
Avoid if prior or current disease |
| **Women of Reproductive Potential** | Pregnancy: Use contraception and discontinue orlistat should pregnancy occur  
Lorcaserin: Use contraception and discontinue lorcaserin should pregnancy occur  
Phentermine/topiramate should pregnancy occur (perform monthly pregnancy checks to identify early pregnancy)  
Naltrexone ER/bupropion ER should pregnancy occur  
Liraglutide 3 mg should pregnancy occur |
| **Breast-feeding** | Not recommended  
Not recommended  
Not recommended  
Not recommended  
Not recommended |
| **Age ≥65 years** | Limited data available  
Limited data available  
Limited data available  
Limited data available  
Limited data available |
| **Alcoholism/Addiction** | Might have abuse potential due to euphoria at high doses  
Topiramate might exert therapeutic benefits  
Avoid due to seizure risk and lower seizure threshold on bupropion |
| **Post-Bariatric Surgery** | Insufficient data  
Insufficient data  
Limited data available  
Insufficient data  
Data available at 1.8 – 3.0 mg/day |

*Use medications only with clear health-related goals in mind; assess patient for osteoporosis and sarcopenia.

**Abbreviations:** BP = blood pressure; CAD = coronary artery disease; CHF = congestive heart failure; HTN = hypertension; T2DM = Type 2 Diabetes Mellitus.
## Diagnosis and Medical Management of Obesity

<table>
<thead>
<tr>
<th>Anthropometric Component (BMI kg/m²)</th>
<th>Clinical Component</th>
<th>Disease Stage</th>
<th>Chronic Disease Phase of Prevention</th>
<th>Suggested Therapy (based on clinical judgment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25</td>
<td>Normal weight</td>
<td>Primary</td>
<td></td>
<td>Healthy lifestyle: healthy meal plan/physical activity</td>
</tr>
<tr>
<td>&lt;23 in certain ethnicities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>waist circumference below regional/ ethnic cutoffs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25–29.9</td>
<td>Overweight stage 0</td>
<td>Secondary</td>
<td></td>
<td>Lifestyle therapy: Reduced-calorie healthy meal plan/physical activity/behavioral interventions</td>
</tr>
<tr>
<td>23–24.9 in certain ethnicities</td>
<td>(no complications)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥30</td>
<td>Obesity stage 0</td>
<td>Secondary</td>
<td></td>
<td>Lifestyle therapy: Reduced-calorie healthy meal plan/physical activity/behavioral interventions</td>
</tr>
<tr>
<td>≥25 in certain ethnicities</td>
<td>(no complications)</td>
<td></td>
<td></td>
<td>Weight-loss medications: Consider after lifestyle therapy fails to prevent progressive weight gain. (BMI ≥27)</td>
</tr>
<tr>
<td>≥30</td>
<td>Obesity stage 1</td>
<td>Tertiary</td>
<td></td>
<td>Lifestyle therapy: Reduced-calorie healthy meal plan/physical activity/behavioral interventions</td>
</tr>
<tr>
<td>≥35 in certain ethnicities</td>
<td>(1 or more mild-moderate complications)</td>
<td></td>
<td></td>
<td>Weight-loss medications: Consider after lifestyle therapy fails to achieve therapeutic target or initiate concurrent with lifestyle therapy. (BMI ≥27)</td>
</tr>
<tr>
<td>≥25</td>
<td>Obesity stage 2</td>
<td>Tertiary</td>
<td></td>
<td>Lifestyle therapy: Reduced-calorie healthy meal plan/physical activity/behavioral interventions</td>
</tr>
<tr>
<td>≥23 in certain ethnicities</td>
<td>(at least 1 severe complication)</td>
<td></td>
<td></td>
<td>Add weight-loss medication: Initiate concurrent with lifestyle therapy. (BMI ≥27)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Consider bariatric surgery: (BMI ≥35)</td>
</tr>
</tbody>
</table>

### Notes:
- All patients with BMI ≥25 have either overweight stage 0, obesity stage 0, obesity stage 1, or obesity stage 2, depending on the initial clinical evaluation for presence and severity of complications. These patients should be followed over time and evaluated for changes in both anthropometric and clinical diagnostic components. The diagnoses of overweight/obesity stage 0, obesity stage 1, and obesity stage 2 are not static, and disease progression may warrant more aggressive weight-loss therapy in the future. BMI values ≥25 have been clinically confirmed to represent excess adiposity after evaluation for muscularity, edema, sarcopenia, etc.
- Stages are determined using criteria specific to each obesity-related complication; stage 0 = no complication; stage 1 = mild-to-moderate; stage 2 = severe.
- Treatment plans should be individualized; suggested interventions are appropriate for obtaining the sufficient degree of weight loss generally required to treat the obesity-related complication(s) at the specified stage of severity.
- BMI ≥27 is consistent with the prescribing information mandated by the US Food and Drug Administration for weight-loss medications.

**Abbreviation:** BMI = body mass index.
AACE OBESITY CARE MODEL

HEALTHY BUILT ENVIRONMENT
- Obesity care legislation
- Health public policy
- Health messaging
- Promotes healthy lifestyle

REFORMED HEALTH CARE SYSTEM
- Payment reform
- Preventive care paradigm
- Optimize drug pipeline
- Education/research
- Patient access to therapy

ACTIVATED PATIENT
- Decision support
- Delivery system design
- Informatics/registries
- Leadership/behaviors
- Continuity of care
- Enhanced access to care
- Coordinated care

PREPARED OBESITY PRACTICE
- Clinical research design
- Relevant metrics
- Improved overall health
- Economic outcomes
- Feedback to revise Clinical Care Model

IMPROVED POPULATION-BASED OUTCOMES
- Technology-driven
- Outcome-driven

FUTURE INNOVATIONS
- Education/research
- Patient access to therapy
- Enhanced access to care
- Coordinated care

Self-management
- Empanelment
- Patient-team partner
- Activated community
- Access to information
## Weight-Loss Medications Approved by the FDA for Long-Term Treatment of Obesity

<table>
<thead>
<tr>
<th>Anti-obesity Medication (Trade Name)</th>
<th>Mechanism of Action, Study Name, Study Duration: % TBWL Greater Than Placebo</th>
<th>Dose</th>
<th>Common Side Effects</th>
<th>Contraindications, Cautions, and Safety Concerns</th>
<th>Monitoring and Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Orlistat</strong> (Xenical™) (Alli™ – OTC)</td>
<td>Lipase inhibitor XENDOS 1 yr: 4.0% 4 yr: 2.6%</td>
<td>120 mg PO TID (before meals) OTC: 60 mg POTID (before meals)</td>
<td>- Steatorrhea - Fecal urgency - Incontinence - Flatulence - oily spotting - frequent bowel movements - abdominal pain - headache</td>
<td>✓ Pregnancy and breastfeeding ✓ Chronic malabsorption syndrome ✓ Cholelithiasis ✓ Oxalate nephrolithiasis ✓ Rare severe liver injury ✓ Cholelithiasis ✓ Malabsorption of fat-soluble vitamins ✓ Effects on other medications: - warfarin (enhance) - antiepileptics (decrease) - levothyroxine (decrease) - cyclopurine (decrease)</td>
<td>Monitor for: - Cholelithiasis - Nephrolithiasis - Recommend standard multivitamin (to include vitamins A, D, E, and K) at bedtime or 2 hours after orlistat dose - Eating &gt;30% kcal from fat results in greater GI side effects - FDA-approved for children ≥12 years old - Administer levothyroxine and orlistat 4 hours apart</td>
</tr>
<tr>
<td><strong>Lorcaserin</strong> (Belviq™)</td>
<td>Serotonin (5HT2c) receptor agonist BLOSSOM BLOOM 1 yr: 3.0%-3.6% 2 yr: 3.1%</td>
<td>10 mg PO BID</td>
<td>- Headache - Nausea - Dizziness - Fatigue - Xerostomia - Dry eye - Constipation - Diarrhea - Back pain - Nasopharyngitis - Hyperprolactinemia</td>
<td>✓ Pregnancy and breastfeeding ✓ Serotonin syndrome or neuroleptic malignant syndrome ✓ Safety data lacking in patients who have depression ✓ Concomitant use of SSRI, SNRI, MAOI, bupropion, St. John's wort as may increase risk of developing serotonin syndrome ✓ Uncontrolled mood disorder ✓ Cognitive impairment ✓ Avoid in patients with severe liver injury or renal insufficiency ✓ Caution with patients with bradycardia, heart block, or heart failure ✓ Unproven concern for potential cardiac valvulopathy ✓ Leukopenia</td>
<td>Monitor for: - Symptoms of cardiac valve disease - Bradycardia - Serotonin syndrome - Neuroleptic malignant syndrome - Depression - Severe mood alteration, euphoria, dissociative state - Confusion/somnolence - Priapism - Leukopenia - Euphoria at high doses could predispose to abuse - Hypoglycemia in patients having T2DM treated with insulin and/or sulfonylureas</td>
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<tr>
<td><strong>Phentermine/Topiramate ER</strong> (Qsymia™)</td>
<td>NE-releasing agent (phentermine) GABA receptor modulation (topiramate) EQUIP CONQUER SEQUEL 1 yr: 8.6%-9.3% on high dose; 6.6% on treatment dose 2 yr: 8.7% on high dose; 7.5% on treatment dose</td>
<td>Starting dose: 3.75/23 mg PO QD for 2 weeks Recommended dose: 7.5/46 mg PO QD Escalation dose: 11.25/69 mg PO QD Maximum dose: 15/92 mg PO QD</td>
<td>- Headache - Paresthesia - Insomnia - Decreased bicarbonate - Xerostomia - Constipation - Nasopharyngitis - Anxiety - Depression - Cognitive impairment (concentration and memory) - Dizziness - Nausea - Dysgeusia</td>
<td>✓ Pregnancy and breastfeeding (topiramate teratogenicity) ✓ Hyperthyroidism ✓ Acute angle-closure glaucoma ✓ Concomitant MAOI use (within 14 days) ✓ Tachyarrhythmias ✓ Decreased cognition ✓ Seizure disorder ✓ Anxiety and panic attacks ✓ Nephrolithiasis ✓ Hyperchloremic metabolic acidosis ✓ Dose adjustment with hepatic and renal impairment ✓ Concern for abuse potential ✓ Combined use with alcohol or depressant drugs can worsen cognitive impairment</td>
<td>Monitor for: - Increased heart rate - Depressive symptomatology or worsening depression especially on maximum dose - Hypokalemia (especially with HCTZ or furosemide) - Acute myopia and/or ocular pain - Acute kidney stone formation - Hypoglycemia in patients having T2DM treated with insulin and/or sulfonylureas - Potential for lactic acidosis (hyperchloremic non-anion gap) in combination with metformin - MAOI (allow ≥14 days between discontinuation) - 15 mg/92 mg dose should not be discontinued abruptly (increased risk of seizure); taper over at least 1 week - Health care professional should check HbA1C before initiating, followed by monthly self-testing at home - Monitor electrolytes and creatinine before and during treatment - Can cause menstrual spotting in women taking birth control pills due to altered metabolism of estrogen and progesterons</td>
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Naltrexone ER/Bupropion ER

**Medication (Trade Name)**: Naltrexone ER/Bupropion ER (Contrave®)

**Year of FDA Approval**: 2014

**Trade Name**: Naltrexone ER/Bupropion ER

**Common Side Effects**
- Nausea
- Headache
- Insomnia
- Dizziness
- Anxiety
- Constipation
- Diarrhea
- Vomiting

**Contraindications**
- Pregnancy and breastfeeding
- Personal or family history of medullary thyroid cancer or MEN2
- Seizure disorder
- Uncontrolled hypertension
- Severe renal impairment
- Uncontrolled migraine disorder
- Generalized anxiety disorder
- Bipolar disorder
- Drug or alcohol withdrawal
- Uncontrolled diabetes mellitus
- Acute gallbladder disease
- Narrow-angle glaucoma

**Warnings**
- Pancreatitis
- Cholelithiasis and Cholecystitis
- Hypoglycemia in patients having T2DM treated with insulin and/or sulfonylureas

**Dose**
- Titrate dose: Week 1: 1 tab (8/90 mg) PO QAM
- Week 2: 1 tab (8/90 mg) PO BID
- Week 3: 2 tabs (total 16/180 mg) PO QHS
- Week 4: 2 tabs (total 16/180 mg) PO QHS

**Monitoring and Comments**
- If the patient has not lost at least 4% of body weight 16 weeks after initiation, the medication should be discontinued.
- If the patient has not lost at least 5% of body weight at 12 weeks on the maintenance dose, the medication should be discontinued.

**References**