

REVIEW ARTICLE

Update on Office-Based Strategies for the Management of Obesity

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KEYWORDS:

Diet

Obesity

Nutrition

Physical Exercise

Weight Loss

Weight Management

ABSTRACT: Over the last several decades, obesity has become one of the most pervasive issues plaguing the United States. The vast amount of comorbidities associated with obesity, ranging from breathing problems to severe cardiovascular disease, place individuals at further risk of developing adverse effects later in life. Currently, clinicians use tools and indices such as body mass index (BMI), percent body fat (%BF) and waist circumference to classify the obesity level of their patients. In 2018 however, the Obesity Medical Association amended its previous algorithms to include two distinct pathologies that fall within the category of obesity: Fat Mass Disease (FMD) and Adiposopathy. These two diagnoses are now classified under obesity, not otherwise specified ICD-10 Code (E66.9). In this article, we discuss the updated methods to classify, identify and manage patients with these disorders.

OBESITY IN PRIMARY CARE

From 2015–2016, obesity affected 93.3 million adults, with a prevalence rate of 39.8%.^{1,2,3} Current evidence shows a disparity among certain groups, with Hispanics and Non-Hispanic African Americans having the highest prevalence of obesity, followed by Non-Hispanic Whites and Non-Hispanic Asians. Middle-aged adults (40–59 years old) have the highest rates of obesity (42.8%) with young adults (20–39 years old) having the lowest rates (35.7%). Studies have also shown that lower education levels are correlated with a higher prevalence of obesity.⁴

Obesity is linked to numerous causes of morbidity and mortality, as well as increased risk of chronic diseases such as hypertension, dyslipidemia, diabetes, coronary artery disease, breathing problems and limitations in overall normal body functioning. The causes and consequences of obesity are multifactorial and should be examined individually by clinicians. Such factors include behavioral, genetic, family history and drug use.

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QUANTIFYING OBESITY

According to the Centers for Disease Control (CDC), adult obesity is defined as any weight that is higher than the healthy weight outlined by the body mass index (BMI).^{1,2,3} Methods used to assess obesity, known as anthropometric indicators, including BMI, percent body fat (%BF) and waist circumference. Each of these methods has certain benefits and detriments. BMI is a low-cost method but does not consider muscle mass. BMI measurements are less accurate in more muscular individuals. BMI is calculated using the following equation: $BMI = (\text{weight in kg}) / (\text{height in m})^2$.⁵ Therefore, a patient that weighs more due to higher muscle content, but who may have a low body fat percentage, will have a higher BMI. BMI values are further described in Table 1.⁶ Similarly, waist circumference mainly measures abdominal adipose tissue and is not superior to BMI. On the other hand, %BF is more specific, but reproducing consistent results is often difficult.⁷ However, obesity can be classified in different categories (Class I, Class II, Class III) based on the measurements obtained. Acceptable values for percent body fat for women are between 25% – 31%, and between 18% – 24% for men. Patients with a %BF $\geq 32\%$ in women, and $\geq 25\%$ in men, are considered obese.⁸ Waist circumference can measure direct anatomical adipose tissue deposition. Patients with a waist circumference ≥ 35 inches in women and ≥ 40 inches in men are considered obese.⁸

All three measurements correlate with an increased risk of developing metabolic syndrome. BMI, %BF and waist circumference are convenient methods of measurement and

TABLE 1:

BMI Classification⁷

| | |
|-------------------------|-------------------|
| BMI < 18 | Underweight |
| BMI: 18 – 24.9 | Normal Weight |
| BMI: 25.0 – 29.9 | Overweight |
| BMI: 30.0 – 34.9 | Class I Obesity |
| BMI: 35.0 – 39.9 | Class II Obesity |
| BMI > 40 | Class III Obesity |

all have their place in the clinical setting. None of the three methods are necessarily superior to the other two. It is a matter of preference to see which method of measurement is best suited for the patient. Still, it is important to use the same particular method of measurement to assess body fat with subsequent visits of the same patient. This allows clinicians to have consistency with their measurements and track patients' progress more accurately.

PATHOPHYSIOLOGY

There are differences between subcutaneous adipose tissue that lies beneath our skin and visceral adipose tissue that lies in our inner abdominal cavity.⁹ Fat can be classified into two categories: visceral and non-visceral. Visceral fat consists of fat tissue located in either the thoracic cavity, intra-abdominal cavity or pelvic cavity.¹⁰ Visceral fat (internal fat) has been demonstrated to be a more sensitive indicator of metabolic disease.^{9,10} On the other hand, non-visceral fat includes fat tissue that is intramuscular and paravertebral. Radiological imaging such as magnetic resonance imaging or dual x-ray absorptiometry are tools used to assess visceral fat. However, these tests can be expensive and may not be covered by insurance if not used for diagnostic purposes.

Similarly, obesity can be further divided into two pathologies: Sick Fat Disease (SFD), also known as Adiposopathy, and Fat Mass Disease (FMD).¹¹ SFD is a disorder in which dysfunctional adipose tissue develops due to deranged endocrine and immune responses. The accumulation of ectopic adipocytes in the viscera is directly related to the development of insulin resistance. These visceral adipocytes can become enlarged and dysfunctional. The patient may present with clinical manifestations such as elevated blood pressure, elevated blood sugar, insulin resistance and dyslipidemia.¹² Currently, SFD is a diagnosis of exclusion. SFD in men can lead to hypoandrogenemia, hyperestrogenism, erectile dysfunction, low sperm count and infertility.¹² In women, SFD can lead to hyperandrogenemia, hirsutism, acne, polycystic ovarian syndrome (PCOS), menstrual disorders, infertility, gestational diabetes mellitus, preeclampsia and thrombosis.¹³

FMD develops as a result of abnormal and pathological physical forces, which may be observed in biomechanical or structural changes. Tissue compression can contribute to clinical manifestations such as hypertension, obstructive sleep apnea or gastroesophageal reflux disease.¹⁴ FMD manifests with biomechanical and structural issues such as stress on weight-bearing joints, immobility, and tissue compression and friction.

TABLE 2:

Five As of Obesity Management: Interviewing Skills²⁵

| | |
|---------------|---|
| ASK | Ask for permission to talk about body weight and determine if there is motivation to change. |
| ASSESS | Asses vitals and baseline measures, including BMI/%BF/Waist Circumference. Assess the reasons for obesity as well as any pathology arising from obesity. |
| ADVISE | Advise about the benefits of weight loss, as well as complications due to obesity. |
| AGREE | Agree on a pathway for the plan to tackle obesity, including weight loss goals, behavioral modification, physical activity, and/or pharmacological intervention, if required. |
| ASSIST | Assist with providing necessary resources including support groups, follow-up appointments with relative specialists, such as a registered dietician, and remove obstacles that hinder weight loss. |

Both disorders have common clinical manifestations that span all organ systems: cardiovascular (congestive heart failure, hypertension, varicose veins, etc.), neurological (stroke, nerve entrapment, carpal tunnel, etc.), pulmonary (dyspnea, obstructive sleep apnea, hypoventilation, etc.), musculoskeletal (immobility, osteoarthritis, etc.), gastrointestinal (hernias, reflux, etc.), integument (striae, pigmentation, etc.), psycho-social (depression, hopelessness, etc.), sleep disorders (snoring, obstructive sleep apnea, etc.), and genitourinary (urinary stress incontinence, buried penis, etc.) diseases. Treatment for SFD involves treating adipocyte and adipose tissue dysfunction, while treatment for FMD involves treating and managing excessive body fat.

EFFECTIVE OFFICE STRATEGIES

Establishing a Baseline

Clinicians should begin their evaluation by taking a complete history and physical exam. Risk factors for obesity should be identified and discussed with patients. If both the patient and physician agree to it, treatment for obesity can commence. The "Five As of Obesity Management" can be used as a guide while interviewing patients, as highlighted in Table 2.¹⁵ Baseline measurements need to be established, including lab tests and body measurements. Table 3 highlights some common lab tests used for establishing a diagnosis. The physician should determine the classification of normal body weight, overweight or obese to make the most appropriate recommendations. In general, dietary and exercise modifications should be pursued as the first line and adjuvant treatment.

Nutrition and Energy

Successful weight loss includes understanding the role nutrition and energy have in the management of obesity by both the physician and the patient. Finding the right balance between a caloric deficit and maintaining caloric nutritional needs to sustain metabolic function is crucial. The first goal is to calculate each patient's energy expenditure. Energy expenditure is composed of 70% resting metabolic rate, with the remainder consisting of physical activity and dietary thermogenesis.¹⁶ The *Harris-Benedict Equation* from Cornell University can be used to calculate the basal energy expenditure.¹⁷ From this equation, a clinician can calculate a realistic caloric goal while incorporating physical activity. After understanding the basal level of calories each patient needs, physicians can begin to reduce caloric intake in a stepwise manner. One pound is equivalent to 3,500 kilocalories (kcal). Ideally, reducing caloric intake by 500 kcal a day would result in the loss of one pound per week. In addition, if physical activity is increased to expend 500 kcal a day, that would result in an additional loss of one pound per week.¹⁵

Furthermore, insulin plays a vital role in the management of obesity as insulin promotes fatty acid and triglyceride storage and synthesis while inhibiting fat break down. Thus, a diet that ultimately lowers the frequency (insulin spikes) and the amount of insulin being secreted is beneficial for weight loss. Though the ultimate goal of weight-loss boils down to more calories burned than consumed, the quality of the calories consumed is important as well. Ultimately, the most effective nutritional therapy is the one that patients can consistently adhere to while making progress towards their goals. Physician familiarity and awareness about diet and nutrition is key to nutritional modification and behavioral changes. Table 4 lists general dietary plans that physicians should be familiar with in order to discuss appropriate options with their patients. Table 5 highlights some of the most popular dietary plans that physicians can review to gain a better understanding. Going through the listed diets with the patient can help identify what plan is the most suitable for them. Eventually, coming up with a tailored plan that limits insulin spikes and is easy to allow for long-term adherence is the most effective nutritional plan. Consults with a registered dietician may also prove to be effective in helping achieve long-term weight loss goals. Education from a registered dietician can provide the necessary information a patient needs to help decipher nutritional labels, build a diet plan that limits insulin spikes and customize the plan to the patient's needs (food preferences, lifestyle and career).

Exercise Plan

The American Heart Association recommends >150 minutes per week of moderate exercise (like a brisk walk). This breaks down to five days a week of moderate exercise for 30 minutes. This exercise prescription, in conjunction with the proper energy restriction of 1200–1800 kcal per day, is effective for weight loss in obese patients.¹⁸ Note that this number will vary for each individual based on their individual metabolic needs. It is important to explain to patients that although weight loss is the goal, maintaining a healthy lifestyle through nutrition and exercise have invaluable advantages that span further than weight loss alone.

TABLE 3:

Diagnostic Tests & Physical Exam^{26,27,28}

| BASELINE MEASURES | PHYSICAL EXAM |
|---|---------------------|
| Fasting Blood Glucose | Vital signs |
| HbA1C | Height & Weight |
| Lipids (HDL, LDL, Cholesterol, Triglycerides) | BMI |
| Liver Enzymes | Blood pressure |
| Electrolytes | Pulse |
| TSH | Neck circumference |
| Vitamin D | Waist circumference |
| Electrolytes | |
| BF% & BMR assessment | |
| CBC | |
| Urinalysis | |

A comprehensive and realistic exercise program should be prescribed, although there are no specific guidelines and evidence for a screening examination for exercise participation. However, physicians should perform a thorough medical evaluation of their patients and consider factors such as any cardiac, pulmonary, musculoskeletal, metabolic, renal or other barriers to physical activity.¹⁹ However, there are those patients who have certain contraindications to exercise. In the case of musculoskeletal complaints, osteopathic manipulative treatment (OMT) to help treat musculoskeletal somatic dysfunctions that limit exercise participation is beneficial. Modifications to a standard exercise program may need to be adjusted for these patients. More frequent follow-up visits (six weeks, then every three months) is recommended for any patients starting a new exercise plan or in patients with chronic disease. This would allow physicians to assess compliance and screen for any signs or symptoms of disease progression.

Behavioral Modifications

Successful weight loss depends on the patient's adherence to a weight loss program.²⁰ Behavior therapy seeks to identify and help alter potentially self-destructive and unhealthy behaviors. The goal of behavioral therapy in obesity is to promote long-term changes to the patient's eating behavior by modifying and monitoring their food intake, increasing physical activity and controlling cues and stimuli in the environment that trigger eating. The osteopathic tenets of incorporating the patient's mind, body and spirit in the management of obesity are paramount for success. Physicians should counsel and educate patients on behavioral changes that will assist with adherence to a weight-loss strategy. In 2011, the Centers for Medicare and Medicaid Services (CMS) initiated coverage of intensive behavioral therapy (IBT) for obesity, providing obese patients 14–15 brief, individual counseling visits in six months. One study showed, in a cohort of 50 patients, a mean of 5.4% weight loss from their initial weight at week 24; 46% of participants lost \geq 5% of their baseline weight.²¹ Integrating lifestyle modifications including encouraging

healthful eating patterns, reducing energy intake, increasing regular physical activity and developing a support system should be considered in conjunction with other weight-loss strategies.²²

Focused Visits with Spaced Repetition

Personalized plans with a comprehensive nutritional program, physical activity plan and behavioral counseling are the foundation of success in the treatment of obesity. However, this is not a set-it-and-forget-it approach. Patient and clinician involvement is essential for achieving long-term goals. After the initial plan is set forth with diet and exercise prescriptions, a one-month follow-up with a specific goal in mind is beneficial. At this follow-up meeting, an evaluation can be made as to the progress made by the patient and the physician has the opportunity to address any questions or concerns the patient may have. After the one-month follow-up, physicians and patients should schedule follow-up appointments based on the patient's obesity-related diseases and comorbid conditions. Unfortunately, there are no universal recommendations that would apply to all patients. These follow-up visits are dependent on individual patient circumstances but are paramount to keep patients accountable and gives them a realistic goal. The traditional method of following up at the next yearly physical is spread too far apart and is more likely to end in noncompliance. Dividing the goals into manageable expectations makes these major life changes more palatable and realistic.

Role of Medication

According to the United States Preventive Services Task Force (USPSTF) guidelines, adjunct pharmacotherapy has been proven to be successful in individuals with BMI ≥ 30 . Pharmacotherapy highlighted by USPSTF includes orlistat, liraglutide, lorcaserin, naltrexone-bupropion and phentermine-topiramate. Dosage recommendations should be followed as dictated by the U.S. Food and Drug Administration, as well as the manufacturer. Table 6 highlights the most commonly used pharmacotherapy, as well as comprehensive pharmacology treatment options. Orlistat, known as *Alli*[®], available over the counter, is a popular drug to initiate treatment. Phentermine-topiramate can be used if other pharmacotherapies are resistant to weight loss.

TABLE 4:
Types of Diets^{29,30,31,32}

| DIET | DESCRIPTION | EFFECTS & RISKS | DESCRIPTION |
|-------------------------------|--|-------------------|--|
| Restricted Carbohydrate Diets | 50–150 g carbohydrates per day | Metabolic Effects | <ul style="list-style-type: none"> Reduces fasting glucose, insulin, triglycerides Modestly increases HDL levels and could moderately reduce BP May increase LDL levels |
| | | Risks | <ul style="list-style-type: none"> Carbohydrate cravings for the first few days If history of gout can cause a flare-up |
| Restricted Fat Diets | 10–30% of total calories come from fat | Metabolic Effects | <ul style="list-style-type: none"> May reduce fasting glucose and insulin levels Modestly decreases LDL and HDL May modestly reduce BP |
| | | Risks | <ul style="list-style-type: none"> Hunger control may present challenges, which may be mitigated with weight management pharmacotherapy Fat restriction could lead to a substantial increase in carbohydrate consumption, which may contribute to hyperglycemia, hyperinsulinemia, hypertriglyceridemia, and reduced HDL |
| Very Low-Calorie Diets | less than 800 kcal/day | Metabolic Effects | <ul style="list-style-type: none"> Reduced fasting glucose, insulin, triglycerides and BP May modestly increase HDL May modestly decrease LDL Reduces BP |
| | | Risks | <ul style="list-style-type: none"> Fatigue, nausea, constipation, diarrhea, hair loss, brittle nails Cold intolerance Small increases in gallstones, kidney stones, gout flare-ups Insufficient mineral intake may predispose to palpitations, cardiac dysrhythmias and muscle cramps Weight regain will occur if patients do not maintain healthy eating |

Surgery

Surgery can be considered as an option if conservative treatment plans show limited progress. Surgery can be used as an adjunct with other treatment plans. It is not necessarily utilized as a final resort if other treatment plans have failed. Individuals can be referred to a bariatric surgeon to see if they are an appropriate candidate for intervention. The interventional plan can be as extensive as involving the disciplines of lifestyle, medication, low-calorie diet and surgery. They can start off gradually, by working on lifestyle changes starting with physical activity and nutritional changes. To maximize treatment, medications and a low-calorie diet can be added, with surgery reserved as an option if the previous treatment proves to be refractory. However, risks with bariatric surgery include micronutrient deficiencies, gallstones, dumping syndrome, band obstruction and strictures, hernias, infection and perforation. There are currently four popular procedures for bariatric surgery.

TABLE 5:

Dietary Patterns Description^{33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44}

| DIET | DESCRIPTION | ENCOURAGES | AVOID |
|------------------------------|---|--|--|
| Mediterranean | This diet has been found to be most successful in reducing the risk of atherosclerotic cardiovascular disease. Emphasizes eating primarily plant-based foods, replacing butter with healthy fats, using herbs and spices instead of salt to flavor foods | The use of olive oil Vegetables, fruit, legumes, whole grains, nuts and seeds Moderate intake of red wine Moderate consumption of seafood, poultry, eggs and fermented dairy products. | Limit large amounts of red meat, meat products, sweets, refined oils, trans fat, processed meat and excessive sugars |
| Therapeutic Lifestyle | A low-fat meal-plan variant. It is most often used by patients with high lipid levels. | Total fat should be 25–35% of daily calories Carbohydrates should be 50–60% of total calories Soluble fiber should be at least 5–10 grams/day 2 grams per day of plant sterols through food | Limit saturated fat to under 7% of total calories Limit cholesterol to under 200 mg a day Avoid foods with trans fatty acids |
| Atkins | This is a carbohydrate-restricted diet that promotes the utilization of fat for energy and generates ketosis. | A. <i>Induction phase</i> : allows no more than 20 grams of carbohydrates per day. Encourages adequate protein intake to reduce insulin levels & generate ketosis. B. <i>Ongoing weight loss phase</i> : allows for a wider variety of vegetables, seeds and nuts, and low-glycemic fruits C. <i>Pre-maintenance phase</i> : once the goal weight is achieved, allows carbohydrate intake to be slowly increased D. <i>Maintenance phase</i> : allows 60-90 grams of carbohydrates per day including legumes, whole grains and fruits All phases encourage a balance of saturated, monounsaturated and polyunsaturated fatty acids | Processed and refined foods Foods with a high glycemic index Foods rich in trans fatty acids In all but the maintenance phase, limit: - cereals, breads, grains - dairy products, except cheese - starchy vegetables - most fruits |
| Ornish | Fat-restrictive diet | Foods in their natural form Vegetables, fruits, whole grains and legumes One serving of soy products per day Limited amounts of green tea Fish oil 3–4 grams per day Small meals eaten frequently throughout the day | Limit dietary fat to > 10% of total daily calories Limit dietary cholesterol to > 10 mg per day Limit sugar, sodium, and alcohol Avoid animal products and caffeine Avoid foods with trans fatty acids Avoid refined carbohydrates and oils |
| DASH | Dietary approaches to stop hypertension (DASH) | Vegetables, fruits and whole grains Fat-free or low-fat dairy products Fish, poultry and lean meats Nuts, seeds and legumes Fiber, calcium, potassium and magnesium | Limit sodium to 1500–2300 mg per day Limit total fat to 27% of total daily calories Limit saturated fat to less than 6% of total caloric intake Limit cholesterol to less than 150 mg per day Avoid red and processed meats Avoid sugar-sweetened beverages Avoid foods with added sugar |
| Paleolithic | Based on a diet pattern presumed to exist during the Paleolithic period | Fresh vegetables, fruits and root vegetables Grass-fed red-lean meats Fish/seafood & eggs Nuts & seeds Healthful oils | Cereals Legumes (including peanuts) Dairy products Potatoes Processed foods Refined sugar, vegetable oils and salt |

TABLE 6:

Pharmacology Management of Obesity^{45, 46, 47, 48, 49, 50}

| MEDICATION NAME | MECHANISM OF ACTION | COMMON SIDE EFFECTS | WARNINGS | DOSING |
|--|--|--|---|--|
| <p>Orlistat (Xenical)*</p> <p>Available in lower dose without prescription (Alli©)</p> | <p>Pancreatic lipase inhibitor; alters fat digestion by inhibiting pancreatic lipases</p> | <p>Diarrhea, gas, leakage of oily stools, stomach pain</p> <p>Levels of fat-soluble vitamins (A, D, E, K) and beta carotene were lowered</p> | <p>Rare cases of severe liver injury have been reported.</p> <p>Avoid taking with cyclosporine.</p> <p>Take a multivitamin pill daily to make sure you get enough of certain vitamins that your body may not absorb from the food you eat.</p> | <p>120 mg TID</p> |
| <p>Liraglutide (Saxenda)*</p> <p>Available by injection only</p> | <p>Long-acting human GLP-1 agonist (an incretin hormone); increases glucose-dependent insulin secretion, decreases inappropriate glucagon secretion, increases B-cell growth/replication, slows gastric emptying and decreases food intake</p> | <p>Nausea, hypoglycemia, diarrhea, constipation, vomiting, abdominal pain, headache, raised pulse, decreased appetite, dyspepsia, fatigue, dizziness</p> | <p>May increase the chance of developing pancreatitis</p> <p>Has been found to cause a rare type of thyroid tumor in animals</p> <p>Contraindicated with personal or family history of medullary thyroid cancer or Type 2 Multiple Endocrine Neoplasia syndrome</p> <p>Discontinue suspected pancreatitis, gall bladder disease or suicidal behavior and ideation</p> <p>May slow gastric emptying, which may impact the absorption of concomitantly administered oral medication</p> | <p>Week 1 = 0.6 mg per day</p> <p>Week 2 = 1.2 mg per day</p> <p>Week 3 = 1.8 mg per day</p> <p>Week 4 = 2.4 mg per day</p> <p>Week 5 and onward = 3.0 mg per day</p> |
| <p>Lorcaserin (Belviq)*</p> | <p>Serotonin-2C receptor agonist. Acts on the serotonin receptors in the brain. May help to feel full after eating smaller amounts of food</p> | <p>Constipation, cough, dizziness, dry mouth, feeling tired, headaches, nausea, weight loss</p> | <p>Serotonin syndrome, heart failure, psychiatric disorder, and priapism</p> <p>Can interact with: serotonergic or anti-dopaminergic medications, St. John's Wort, triptans, bupropion, dextromethorphan, CYP 2D6 substrates</p> | <p>10 mg twice per day for immediate-release formulation</p> <p>20 mg once per day for the extended-release formulation</p> |
| <p>Phentermine-topiramate (Qsymia)*</p> | <p>A mix of two medications: phentermine, which lessens the appetite, and topiramate, which is used to treat seizures or migraine headaches. May make patients less hungry or feel full sooner</p> | <p>High blood pressure, rapid/irregular heart rate, overstimulation tremor, insomnia, constipation, dizziness, dry mouth, taste changes, especially with carbonated beverages, tingling of your hands and feet, trouble sleeping</p> | <p>Not used with glaucoma or hyperthyroidism</p> <p>Not used with pregnancy or before pregnancy or lactation</p> | <p>Once-daily in the morning with or without food</p> <p>Starting dose = 3.75 mg/23 mg (phentermine/topiramate extended-release)</p> <p>After 14-day intervals, and as clinically indicated, escalate doses to:</p> <ul style="list-style-type: none"> • Recommended dose = 7.5 mg/46 mg • Titration dose = 11.25 mg/69 mg • Top dose = 15 mg/92 mg |
| <p>Naltrexone-bupropion (Contrave)*</p> | <p>A mix of two medications: naltrexone, which is used to treat alcohol and drug dependence, and bupropion, which is used to treat depression or help people quit smoking</p> | <p>Constipation, diarrhea, dizziness, dry mouth, headache, increased blood pressure, increased heart rate, insomnia, liver damage, nausea, vomiting</p> | <p>Not used with uncontrolled high blood pressure, seizures, or a history of anorexia or bulimia nervosa</p> <p>Not used with bupropion (Wellbutrin, Zyban)</p> <p>MAY INCREASE SUICIDAL THOUGHTS OR ACTIONS.</p> | <p>Week 1 = 1 tablet in AM, no tablets in PM</p> <p>Week 2 = 1 tablet in AM, 1 tablet in PM</p> <p>Week 3 = 2 tablets in AM, 1 tablet in PM</p> <p>Week 4 and beyond = two tablets in AM, two tablets in PM</p> |
| <p>Other medications that curb your desire to eat include:</p> <ul style="list-style-type: none"> • phentermine • benzphetamine • diethylpropion • phendimetrazine | <p>Centrally acting on the satiety center of the brain</p> <p>Note: FDA-approved only for short-term use—up to 12 weeks</p> | <p>Dry mouth, constipation, difficulty sleeping, dizziness, feeling nervous feeling restless, headache, raised blood pressure, raised pulse</p> | <p>Not used with heart disease, uncontrolled high blood pressure, hyperthyroidism, or glaucoma</p> <p>Can cause anxiety</p> | <p>Standard dosing regimen</p> |

*Most common pharmacological therapy as per the United States Preventive Services Task Force (USPSTF) Guidelines 2019

The greatest expected weight loss is from the *Biliopancreatic Diversion with Duodenal Switch* procedure with weight loss predicted as high as 70–80%. It is optimal for patients with Type II Diabetes Mellitus but is considered to be the most challenging bariatric surgery.²³ Other bariatric procedures include *Roux-en-Y Gastric Bypass*, the *Vertical Sleeve Gastrectomy* and the *Laparoscopic Adjustable Gastric Banding*.^{23,24} Even after bariatric surgery, the patient's treatment plan continues, including lifestyle management as well as obesity-related pharmacotherapy.

CONCLUSION

Obesity is a complicated, multifactorial disease, and so is the treatment plan. Preventative medicine in these patients is the name of the game. The goals of obesity management are to assist patients during their weight loss journey, prevent obesity-related diseases and prevent weight regain. If the patient already has obesity-related comorbidity, an additional treatment goal would be to decrease or eliminate these clinical manifestations. However, there are certain protocols, tools and medications that clinicians may employ with all patients along the obesity spectrum. Establishing appropriate baseline measurements, implementing diet/exercise changes, incorporating osteopathic principles and treatment and using appropriate medications and surgeries, where necessary, are the foundation of success in managing patients with obesity. With the tools we have outlined above, clinicians will be well prepared to recognize and treat patients with obesity.

AUTHOR DISCLOSURES:

The author(s) declare no relevant financial affiliations or conflicts of interest.

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