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OHSU HEALTH SYSTEM

OFFICE OF CLINICAL INTEGRATION AND EVIDENCE-BASED PRACTICE

GUIDELINE FOR WEIGHT MANAGEMENT

Background: Obesity is a prevalent, complex, progressive and relapsing chronic disease, characterized by excess adiposity that affects health, increases the risk of long-term medical complications and contributes to reduced lifespan. [1-4] Although typically defined using body mass index (BMI) thresholds, excess adiposity can occur at any BMI when central fat distribution or abnormal intra-organ lipid accumulation occurs. As with other chronic diseases, unwanted weight gain results from a complex interaction of genetic, environmental and behavioral determinants. [3] Expression of overweight and obesity occurs when these determinants converge to cause disruption of normal homeostatic weight regulatory systems that leads to a period of positive energy balance followed by re-establishment energy equilibrium at a new, higher body-weight set point. [5] The goal of the OHSU Health Weight Management Guideline is to improve the management of people living with overweight and obesity through developing guidelines, standards, and policies that promote optimal patient care.

Prevalence: Data from the National Health and Nutrition Examination Surveys show that roughly two out of three adults in the United States is overweight or obese, and more than one out of three adults is obese. [3, 6] Moreover, over the past five decades, rates of childhood obesity have increased almost four-fold. Prevalence rates vary by sex, race and socioeconomic status, with higher rates in women, certain ethnicities, low socioeconomic status groups, and those currently or historically subjected to racial discrimination. [1, 2, 6-8]

Complications: Obesity is directly linked to a number of complications including type 2 diabetes, hypertension, obstructive sleep apnea, non-alcoholic fatty liver disease (NAFLD), heart disease, heart failure, cancer, gallstones, chronic kidney disease, osteoarthritis, and gastroesophageal reflux disease, as well as impaired quality of life, psychological and psychiatric morbidities. [9] Individuals with overweight or obesity frequently experience weight-based stigmatization. [4, 7] Given the health and psychosocial consequences, improving the screening and treatment overweight and obesity throughout the lifespan has important positive health implications. Prevention could be applied to those at risk for developing obesity, or even to those individuals with overweight to prevent development of obesity.

Definitions:

Body Mass Index (BMI): A person's weight in kilograms divided by their height in meters squared. For adults, The National Institutes of Health (NIH) defines normal weight, overweight, and obesity according to ranges of BMI rather than the traditional height/weight charts. In pediatrics where height and weight are continuously changing during growth, percentiles (the relative position of the BMI, weight, or height among a population of the same sex and age) rather than specific BMI ranges are commonly to assign disease severity.

Waist Circumference (WC): Another way to estimate risk of excess adiposity is to obtain a waist circumference. This is typically measured at the level of the posterior, superior iliac crest. It is considered a surrogate for visceral fat accumulation, which contributes to expression of several metabolic diseases including type 2 diabetes, dyslipidemia, NAFLD, and cardiovascular disease.

*Classification of Normal, Overweight, and Obese**

- Healthy weight: Adults with a BMI range between 18.5 and 24.9 kg/m^2; Children up to the 85th percentile.
- Overweight: Adults with a BMI range between 25.0 to 29.9 kg/m^2; Children between the 85th and 95th percentile.
- Obese: Adults with a BMI of 30.0 kg/m^2 or higher; Children in the 95th percentile or greater.
  Adult Obesity Classifications
  - Obesity Class 1: BMI of 30 to <34.9 kg/m^2
  - Obesity Class 2: BMI of 35 to <39.9 kg/m^2
  - Obesity Class 3: BMI of 40 kg/m^2 or higher. Class 3 obesity is sometimes categorized as "extreme" or "severe" obesity
- Thresholds for central obesity use the following criteria for waist circumference:
  - An adult male whose waist circumference is equal to or greater than 40 inches (102 cm)

- An adult non-pregnant woman whose waist circumference is equal to or greater than 35 inches (88 cm)

*Threshold criteria for BMI and waist circumference are generally lower for Asian populations. [10]

Guideline Eligibility Criteria:

- Adult patients with a BMI ≥ 30 kg/m^2
- Adult patients with a BMI ≥ 27 kg/m^2 with co-morbidities
- Pediatric patients in the 85th percentile or greater

- Including patients with co-morbidities (such as heart disease, hypertension, dyslipidemia, type II diabetes, osteoarthritis, sleep apnea, certain malignancies, and all-cause mortality)

Guideline Exclusion Criteria:

- Adult patients with a lifetime maximal BMI < 25 kg/m^2
- Pediatric patients below the 85th percentile
- Patients with anorexia nervosa
- Pregnant women

Clinical Practice Recommendations:

Table 1: 5 Steps for Caring for Patients Living with Unwanted Weight Gain, Overweight, and Obesity [4]

Step 1: Recognition	Recognition of overweight and obesity as chronic diseases by health care providers, who conscientiously raise discussion of these conditions to offer health guidance and treatment advice in an unbiased and non-judgmental manner.
Step 2: Assessment	Assessment of individual living with overweight and obesity, using appropriate measurements, identifying primary causes and secondary contributors to unwanted weight gain, and screening for complications and barriers to weight management.
Step 3: Discussion	Ask patient's permission to discuss weight. Provide patient with information on treatment options including some combination of lifestyle, behavioral, pharmacologic, and surgical interventions.
Step 4: Agreement	Agreement with the person living with overweight and obesity regarding goals of therapy, focusing mainly on the value that the health-based benefits a person derives from interventions.
Step 5: Engagement	Engagement by health care providers with the person with overweight and obesity in continued follow-up and reassessments, with encouragement and advocacy to improve care for these chronic diseases and their complications.

Step 1: Recognition

Recognition of overweight and obesity as chronic diseases by health care providers, who conscientiously raise discussion of these conditions to offer health guidance and treatment advice in an unbiased and non-judgmental manner. [4]

Addressing weight bias in the health care setting

Individuals with overweight or obesity can encounter weight bias. Weight bias is the differential and negative treatment and attitudes experienced by people who have overweight or obesity. Whereas, weight stigma refers to acting on weight-biased beliefs. Those experiencing weight bias from health care professionals are more likely to avoid health screenings, cancel appointments, demonstrate maladaptive eating behaviors, and experience poorer outcomes when receiving treatment for overweight or obesity. Thus, clinicians should work to ensure that health care experiences for individuals with overweight or obesity are free of weight bias. This can be achieved by ensuring clinicians' understanding of the complex etiology of obesity, including the physiological regulators of weight and obesity that are outside of personal control and limit the achievement of significant, sustainable weight loss by diet and exercise (lifestyle) alone, in the majority of cases. Such understanding on the part of the practitioner will increase empathy regarding the challenges of living with overweight and obesity, thus reducing weight bias and enhancing acceptance of all available weight management options **(Consensus based on external guidelines)**. [4, 7, 11, 12]

People with overweight and obesity
Experience weight bias and stigma → Increased complications and mortality independent of weight or BMI

A key to reducing weight bias, stigma and discrimination in health care settings is for the health care providers to be aware of their own attitudes and behaviors toward individuals living with overweight and obesity **(Consensus based on external guideline)**. [4, 13]

Practice Implication:

-Clinicians should attend training annually to develop knowledge, skills, and awareness related to weight bias and stigma.

Initiating discussion of weight management

Clinicians should learn to conscientiously, and without bias or judgement, initiate a discussion about weight management when appropriate. Ask patient's permission to discuss weight, if the patient is receptive, proceed to assessment and a conversation involving treatment options **(Consensus based on external guideline).** [4]

Step 2: Assessment

Assessment of individual living with overweight and obesity, using appropriate measurements, identifying primary causes and secondary contributors to unwanted weight gain, and screening for complications and barriers to weight management [4]

Identification of overweight and obesity

Children and adolescents

Body mass index percentile or z-score is the recommended screening test for obesity. Body mass index percentile is plotted on growth charts, such as those developed by the CDC, which is based on US-specific, population-based norms for children 2 years and older **(Strong Recommendation; Moderate Quality Evidence)**. [2, 7, 9, 14]

- Overweight is defined in the 85-94th percentile.
- Obesity is the 95th percentile or greater.
- Severe obesity as ≥120% of the 95th percentile.

Screening Interval: Height and weight, which are necessary for BMI percentile and/or z-score calculation, should be taken at a minimum:

- Every well visit for children over the age of 2.

- Length and weight for children under the age of 2 may be used to help assess growth trajectories. BMI in this age group does not have data supporting its routine use.

Waist circumference and skinfold thickness are not recommended as routine measures. Use waist circumference in selective situations to assess risk for cardiovascular and metabolic factors **(Conditional Recommendation, Low Quality Evidence)**. [9, 15, 16]

Adults

All adults should be screened annually with measurement of body mass index (BMI) measurement. Although BMI has its limitations, it remains a valuable tool for screening and treatment purposes **(Strong Recommendation; Moderate Quality Evidence)**. [3, 4, 16]

- "Overweight" is a BMI of 25 to 29.9 kg/m^2
- "Obesity" is a BMI of 30 kg/m^2 or higher
- Obesity is further categorized as class I (BMI of 30.0 to 34.9 kg/m^2), class 2 (BMI of 35.0 to 39.9 kg/m^2), or class 3 (BMI of >/=40 kg/m^2).

Screening measurements should be used to confirm an excessive degree of adiposity and to classify individuals as having overweight or obesity, after taking into account age, gender, ethnicity, fluid status, and muscularity. Therefore, clinical evaluation and judgment must be used when BMI is employed as the anthropometric indicator of excess adiposity, as for example in populations with higher muscle mass (e.g., athletes) or those with sarcopenia **(Strong Recommendation; Moderate Quality Evidence)**. [3]

An initial waist circumference in patients with BMI <35 kg/m^2 may be helpful for the identification of adiposity-related disease risk. In many populations, a waist circumference cutoff point ≥37 inches (94 cm) in men and ≥35 inches (80 cm) in women should be considered at risk and consistent with abdominal obesity; although in the United States populations of European heritage cutoff points can be increased to ≥40 inches (102 cm) for men and ≥35 inches (88 cm) for women **(Strong Recommendation; Moderate Quality Evidence)**. [3]

BMI cutoff point value of ≥23 kg/m^2 should be used in the screening and confirmation of excess adiposity in adults with heritage from South Asia, Southeast Asia, and East Asia **(Strong Recommendation; Moderate Quality Evidence)**. [3]

Region- and ethnic-specific cutoff point values for waist circumference should be used as measures of abdominal adiposity and disease risk; in adults with heritage from South Asia, Southeast Asia, and East Asia, men with values ≥85 cm and women ≥74 to 80 cm should be considered at risk and consistent with abdominal obesity **(Strong Recommendation; Moderate Quality Evidence)**. [3]

Practice Implication:

To measure waist circumference, locate the upper bone and the top of the right iliac crest (arching bones on both sides of pelvis). Place a measurement tape in a horizontal plane around the abdomen at the level of the iliac crest. Before reading the tape measure, ensure that the tape is snug, but does not compress the skin, and is parallel to the floor. The measurement is made at the end of a normal expiration. The measurement is repeated until two sequential measurements agree to within 0.5 cm. [17]

Use clinical judgement to decide frequency of measuring a person's height and weight beyond screening requirements that are based on age. Before measuring height and weight, ask patient's permission and take weight privately **(Consensus based on external guideline)**. [9]

Medical Assessment of Overweight and Obesity

Clinicians should promote a holistic approach to health with a focus on wellness behaviors in all patients and address the root causes of, and contributors to, weight gain with care to avoid stigmatization **(Consensus based on external guideline).** [4]

- Root causes and contributors (individually and in combination) to unwanted weight gain include biological factors such as genetics, epigenetics, neurohormonal mechanisms, associated chronic diseases and obesogenic medications, current lifestyle practices, sociocultural practices and beliefs, social determinants of health, built environment, individual life experiences like adverse childhood experiences, and psychological factors such as mood, anxiety, self-worth and identity.

Working with people to understand their context and culture, and integrate their root causes, allows for the development of personalized plans **(Consensus based on external guideline).** [4]

Children and adolescents

Assess for specific risk factors including parental obesity, access to low-quality foods, sedentary behaviors and low levels of physical activity (including inaccessibility to safe play areas), food insecurity, inadequate sleep, and low family income. Common obesity-associated complications in children include (but are not limited to) prediabetes and type 2 diabetes, dyslipidemia (high triglyceride, low HDL cholesterol levels), obstructive sleep apnea, psychopathological conditions including low self-esteem and depression, and non-alcoholic fatty liver disease (Appendix A) (**Strong Recommendation; Moderate Quality Evidence**). [14, 18]

Adult

Assess for specific risk factors including access to low-quality foods, sedentary behaviors or low levels of physical activity, food insecurity, inadequate sleep, and low family income. Assess for the presence of obesity-associated conditions among patients who meet criteria for overweight and obesity by BMI and/or increased waist circumference. Common adiposity-associated complications include (but are not limited to) hypertension, prediabetes and type 2 diabetes, dyslipidemia (high triglyceride, low HDL cholesterol levels), atherosclerotic vascular disease, congestive heart failure, polycystic ovarian disease, menstrual irregularities , obstructive sleep apnea, degenerative joint disease, non-alcoholic fatty liver disease, depression and other psychopathological conditions (depression, anxiety, poor self-esteem), impaired activities of daily living, and cancer (Appendix B) (**Strong Recommendation; Moderate Quality Evidence**). [3, 9, 19]

Step 3: Discussion

Ask patient's permission to discuss weight. Provide patient with information on treatment options including some combination of lifestyle, behavioral, pharmacologic, and surgical interventions. [4]

Patients should receive individualized care plans that address their root causes of unwanted weight gain, overweight, and obesity and that provide support for behavioral change and weight loss therapies **(Consensus based on external guideline)**. [4]

Readiness Assessment

Clinicians involved in the screening, assessing and managing of patients with obesity use the 5As framework to initiate the discussion by asking patient's and/or family's permission and assessing their readiness to begin treatment **(Consensus based on external guideline).** [4]

Ask about weight in an unbiased and non-judgmental manner, and explore readiness for change
Assess obesity class and stage; assess drivers, complications and barriers
Advise on obesity risks, explain benefits of modest weight loss and discuss treatment options
Agree on realistic weight-loss expectations, focus on behavioral goals (SMART) and health outcomes
Assist in identifying and addressing drivers and barriers. Provide education and resources. Initiate first line lifestyle and therapeutic treatments. Refer to appropriate providers or multi-disciplinary teams. Arrange for regular, timely follow-up

Clinicians should promote a holistic approach to health with a focus on health behaviors in all patients and address the root causes of weight gain with care to avoid stigmatizing **(Consensus based on external guideline).** [4]

Step 4: Agreement

Agreement with the person living with overweight and obesity regarding goals of therapy, focusing mainly on the value that the health-based benefits a person derives from interventions. [4]

Clinicians should talk with their patients and craft person-centered treatment plans as well as realistic expectations and sustainable goals for behavioral change and health outcomes **(Consensus based on external guideline).** [4]

Suggest that health care providers caring for racial and ethnic minority patients living with obesity: [4]

- Engage with the patient's social realities
- Validate the patient's experience of stress and systematic disadvantage influencing health and obesity, exploring elements of their environment where reduced stress could shift behaviors.
- Expect patient mistrust in health systems; reposition themselves as a helper to the patient instead of as an expert, which may stir resistance and be a barrier to patients' wellness.
- Build patient knowledge and capacity for obesity self-management through longitudinal explorations of co-occurring health, social, environmental and cultural factors. Strive to build relationships that incorporate healing from multigenerational trauma.
- Include in treatment plan potential for patient anticipation of racism or unequal treatment.
- Elicit and incorporate the patient's individual and community-based concepts of health and healthy behaviors in relation to body size, activity and food preference.

Behavioral Interventions

Similar to other chronic diseases (e.g., hypertension, hyperlipidemia, diabetes), achieving healthy lifestyle changes is foundational to the prevention of unwanted weight gain and the management of overweight and obesity. These changes should be lifelong and continued even when weight-loss medications and/or surgery are recommended. The practitioner should use an empathetic, culturally sensitive, and empowering counseling style such as motivational interviewing, and work with patient to create SMART (Specific, Measurable, Achievable, Realistic, Timely) goals. Set realistic expectations for health outcomes from lifestyle changes **(Strong Recommendation, Moderate Quality Evidence)**. [1, 2, 7, 9, 15, 20, 21]

Children and adolescents

Deliver any behavior intervention with the support of an appropriately trained professional. Comprehensive behavioral modification programs to include food and activity monitoring, and development of nutritional and physical activity goals **(Strong Recommendation, Low Quality Evidence)**. [7, 9, 15, 22]

Behavioral modification strategies:

- Goal setting
- Positive behavior change
- Stimulus control
- Rewards for reaching goals
- Problem solving
- Encourage parents to role-model desired behaviors

Adults

Deliver any behavior intervention with the support of an appropriately trained professional. Interventions can include: Self-monitoring of weight, food intake, and physical activity; SMART goal-setting; education pertaining to body weight regulation and the pathophysiology that leads to overweight and obesity, nutrition, and physical activity; face-to-face and group meetings; stimulus control systematic approaches for problem solving; stress reduction; cognitive restructuring [is, cognitive behavioral therapy]; motivational interviewing **(Strong Recommendation, Moderate Quality Evidence)**. [1-3, 9, 23]

Behavioral modification strategies:

- Self-monitoring of behavior and progress
- Stimulus control
- Goal setting
- Slowing rate of eating
- Ensuring social support
- Problem solving
- Assertiveness
- Cognitive restructuring (modifying thoughts)
- Reinforcement of changes
- Relapse prevention
- Strategies for dealing with weight regain.

Lifestyle Interventions

Lifestyle interventions should be recommended for all patients with overweight or obesity. Recommend behavior change strategies to increase physical activity or decrease inactivity and improve quality of patient's diet. Inform patients that there is a modest (on average) dose response with number of lifestyle interventions and improvement in overall health and weight loss. Develop realistic targets of weight loss and health improvements with the patient and provide information that significant clinical benefits, including improvements in cardiometabolic risk and progression to type 2 diabetes, may be achieved even by modest weight loss (i.e. 4-8% of initial body weight) with lifestyle modifications **(Strong Recommendation, Moderate Quality Evidence)**. [9, 12, 17, 19, 23-28]

Use the social-ecological model as a framework on how individuals make lifestyle choices each day to better understand individual choices and motivators and the context that affects them to help identify which strategies are most likely to be effective at promoting healthy choices **(Consensus)**. [29]

Children and adolescents

Family-based multicomponent lifestyle interventions are recommended, with a minimum of 26 contact hours, initiated at the earliest stage possible. Clinicians should support intensive, age-appropriate, culturally sensitive, family-centered lifestyle modifications (nutritional, physical activity, behavioral) (**Strong Recommendation, Moderate Quality Evidence**). [9, 14, 18, 24, 30-33]

Adults

Multicomponent lifestyle interventions are recommended consisting of nutritional, physical activity and behavioral components. Clinicians should support culturally sensitive, patient-centered lifestyle modifications. Intensive lifestyle interventions involve several sessions over weeks to months, recommend at least 12 sessions within 6 months to patients (**Strong Recommendation, Moderate Quality Evidence**). [2, 3, 17]

Nutritional Interventions

Simple and realistic food intake modifications have the highest likelihood of success. Diets that advise extreme macronutrient changes should be avoided because they are ineffective in the long term and can be harmful. For nutritional interventions, the overall treatment goal is to develop an individualized, achievable, long-term plan of care that will help patients successfully improve health outcomes and achieve a healthier weight, which in many cases might be weight stability following a period of weight loss **(Strong Recommendation, Moderate Quality Evidence)**. [2, 9, 15, 34, 35]

Children and adolescents

The following interventions have been shown to be effective for improving health and reducing/maintaining body weight in the family setting **(Strong Recommendation, Moderate Quality Evidence)** [9, 15, 35, 36]

- Increase consumption of whole-foods including vegetables, fruits, nuts, seeds, beans, legumes and whole grains
- Reduce sugar-sweetened beverages (including juices, sports drinks, energy drinks and specialty drinks including coffee drinks)
- Reduce consumption of prepared and processed foods and develop healthy meal & snack schedules
- Encourage family meals
- Reduce meals consumed outside of the home (eating out)

Adults

An appropriate dietary regimen should be individualized and can be achieved in a number of ways. The following is general advice that can be provided to patients: **(Strong Recommendation, Moderate Quality Evidence)** [3, 9, 11, 25, 36]

- Increase consumption of whole-foods including vegetables, fruits, nuts, seeds, beans, legumes and whole grains
- Decrease consumption of energy dense foods (typically ultra-processed foods) and drinks
- Decrease the size of food portions
- If snacking between meals, cannot be avoided, choose healthy snacks and avoid prepared or processed foods
- Encourage family meals
- Reduce meals consumed outside of the home (eating out)

Very low-calorie diets should be used cautiously and requires medical supervision within a specialty center. If recommended, treatment should be part of a multicomponent weight management strategy ensuring that the diet is nutritionally complete and is followed for a maximum of 12 weeks **(Strong Recommendation, Moderate Quality Evidence)**. [3, 9]

Physical Activity

Encourage patient to reduce sedentary behavior and to increase their level of physical activity, even if they do not lose weight as a result because these changes can contribute to the prevention of weight gain and has wider health benefits (e.g. reduced risk of type 2 diabetes and cardiovascular disease). **(Strong Recommendation, Moderate Quality Evidence)** [1, 2, 9, 15, 18, 19]

Exercise alone can result in weight loss, but average reductions are modest. Research studies have shown that exercise alone results in an average body mass reduction of 3-4% in children and adolescents. For adults, the average effect size ranged from 0.04 to 0.36 standard mean difference depending on type of exercise and length of intervention. Therefore, setting realistic expectations with patients regarding how much weight they can expect to lose during counseling is important for long-term adherence. Highlight with patients other health benefits gained from physical activity (prevention of weight gain, reduced risk of type 2 diabetes and cardiovascular disease) **(Strong Recommendation, Moderate Quality Evidence)** [37, 38]

Individualize a program based on physical activities that are appropriate for patient's current abilities, fitness level, health goals, socioeconomic and environmental factors. Increase physical activity, both exercise and non-exercise activity, gradually over time to meet health goals. Inactive patients should start with lower intensity activities and gradually increasing how often and how long activities are done. **(Conditional Recommendation, Low Quality Evidence)** [3, 15, 39, 40]

Children and adolescents

Work with child or adolescent to pick an activity that is appropriate to his/her ability and confidence. **(Conditional Recommendation, Low Quality Evidence)** [15, 39]

- Preschool-aged children (ages 3 through 5 years) should be physically active throughout the day to enhance growth and development. Care givers should encourage at least 120 minutes of activity each day or 15 non-sitting minutes each hour.
- Children and adolescent ages 6 through 17 years should do 60 minutes or more of moderate-to-vigorous physical activity daily (examples included in table 2):
    - *Aerobic*: Most of the 60 minutes or more per day should be moderate- or vigorous-intensity aerobic physical activity and should include vigorous-intensity physical activity on at least 3 days a week.
    - *Muscle-strengthening*: As part of their 60 minutes or more of daily physical activity, children and adolescents should include muscle-strengthening physical activity on at least 3 days a week.
    - *Bone-strengthening*: As part of their 60 minutes of more of daily physical activity, children and adolescents should include bone-strengthening physical activity on at least 3 days a week.
- Recommend working with a qualified trainer or coach when attempting resistance exercise with weights

Table 2: Examples of Moderate- and Vigorous-Intensity Aerobic Physical Activities and Muscle- and Bone-Strengthening Activities for Children and Adolescents [39]

Type of Physical Activity	Age Group Children	Age Group Adolescents
Moderate-Intensity Aerobic	• Active recreation, such as hiking, skateboarding, rollerblading • Bicycle riding • Brisk walking	• Active recreation, such as canoeing, hiking, skateboarding, rollerblading • Brisk walking • Bicycle riding (stationary or road bike) • Housework and yard work, such as sweeping or pushing a lawn mower • Games that require catching and throwing, such as baseball and softball

Vigorous-Intensity Aerobic	• Active games involving running and chasing, such as tag • Bicycle riding • Jumping rope • Martial arts, such as karate • Running • Sports such as soccer, ice or field hockey, basketball, swimming, tennis • Cross-country skiing	• Active games involving running and chasing, such as flag football • Bicycle riding • Jumping rope • Martial arts, such as karate • Running • Sports such as soccer, ice or field hockey, basketball, swimming, tennis • Vigorous dancing • Cross-country skiing
Muscle-Strengthening	• Games such as tug-of-war • Modified push-ups (with knees on the floor) • Resistance exercises using body weight or resistance bands • Rope or tree climbing • Sit-ups (curl-ups or crunches) • Swinging on playground equipment/bars	• Games such as tug-of-war • Push-ups and pull-ups • Resistance exercises with exercise bands, weight machines, hand-held weights • Climbing wall • Sit-ups (curl-ups or crunches)
Bone-Strengthening	• Games such as hopscotch • Hopping, skipping, jumping • Jumping rope • Running • Sports such as gymnastics, basketball, volleyball, tennis	• Hopping, skipping, jumping • Jumping rope • Running • Sports such as gymnastics, basketball, volleyball, tennis

Adults

Adults should move more and sit less throughout the day. Some physical activity is better than none. Adults who sit less and do any amount of moderate-to-vigorous physical activity gain some health benefits. **(Strong Recommendation, Moderate Quality Evidence)** [1, 3, 39]

For more substantial health benefits, adults should do at least 150 minutes (2 hours and 30 minutes) to 300 minutes (5 hours) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) to 150 minutes (2 hours and 30 minutes) a week of vigorous-intensity aerobic activity. Preferably, aerobic should be spread throughout the week. **(Strong Recommendation, Moderate Quality Evidence)** [1, 3, 19, 25, 39]

Table 3: Moderate- vs. Vigorous-intensity Physical Activity

Moderate-intensity Physical Activity [41]	**Vigorous-intensity Physical Activity** [41]
Requires a moderate amount of effort and noticeably accelerates the heart rate.	Requires a large amount of effort and causes rapid breathing and a substantial increase in heart rate

Examples include: • Brisk walking • Dancing • Gardening • Housework • Active involvement in games and sports with children/walking domestic animals • General building tasks (e.g. roofing, thatching, painting) • Carry/moving moderate loads (<45lbs)	Examples include: • Running • Walking/Climbing briskly up a hill • Fast cycling • Aerobics • Fast swimming • Competitive sports and games (e.g. Football, Volleyball, Basketball, Soccer) • Heavy shoveling or digging ditches • Carry/moving heavy loads (>45lbs)

For patients with chronic conditions or symptoms, consult specialist about the types and amounts of activity that appropriate for the individual patient. **(Conditional Recommendation, Low Quality Evidence)** [39]

Community Partnerships

Prevention includes educating and promoting healthy eating and regular exercise within and outside the health care setting. Clinicians should utilize community partnerships that are tailored to the patient, the patient's needs and the resources that are available within the community **(Strong Recommendation, Moderate Quality Evidence)**. [11, 29, 39]

Pharmacologic Therapy

Children and adolescents

For patients older than 12 years, if BMI or weight does not improve after 3-6 months of a comprehensive, multidisciplinary behavioral intervention (including healthy diet, physical activity, and behavioral monitoring), providers may consider adding pharmacologic therapy. Providers should consider family support, emotional readiness, and ability to adhere to pharmacologic regimen as part of a comprehensive intervention, and the benefits and risks of a medication in conjunction with any weight-related comorbidities when assessing patient eligibility **(Strong Recommendation, Moderate Quality Evidence)**. [42]

Two medications are FDA approved for long-term use in adolescents (age ≥12 years) and one is approved for children 6 years and older **(Consensus)**. [43-46]

- When combined with a lifestyle program, liraglutide 1.0 (Saxenda) can be titrated from 0.6 mg subcutaneously daily to 3.0 mg daily as tolerated. Compared to placebo, one year of therapy resulted in body weight loss (estimated difference from placebo) of −4.50 kg for absolute change and of −0.22 (95% confidence interval −0.37 to −0.08, P=0.002) for BMI standard-deviation score). Side effects were most commonly related to gastrointestinal symptoms (nausea, vomiting) and is contra-indicated in patients with a personal or family history of medullary thyroid carcinoma or multiple endocrine neoplasia syndrome type 2.
- Setmelanotide (Incivree) may be used in children 6 years an older with a monogenic obesity due to pro-opiomelanocortin (POMC), proprotein convertase subtilisin/kexin type 1 (PCSK1), or leptin receptor (LEPR) deficiency in individuals ages 6 or older. It is given as a once daily subcutaneous injection starting at 2 mg daily in patients age 12 or older and 1 mg daily in patients age 6 to less than 12 years. Dose may be titrated up to a maximum of 3 mg daily depending on tolerance and efficacy. The most common adverse events were injection site reactions, hyperpigmentation, and nausea. One case of suicidal ideation was reported in a child receiving active drug, but this was thought not to be study drug related.
- The addition of Orlistat (Xenical, Alli) 120 mg capsules three times daily with meals, in conjunction with a reduced-calorie diet, behavioral modification program, and physical activity, resulted in a modest BMI reduction over 1 year (0.55 kg/m^2) in adolescents ages 12 to 16 years. In the intent-to-treat population, 19% of patients lost greater than 5% body weight, while 9.5% lost greater than 10% of their body weight.

- While orlistat is approved for use, there are significant GI side effects. In addition, patients must follow a reduced-fat diet (<30% daily calories from fat) and take a fat-soluble vitamin supplement daily (more than 2 hours before or after orlistat) due to poor absorption of dietary nutrients associated with treatment.

Use of off-label medications should only be considered in consultation with specialists **(Consensus)**. [43, 44]

Practice Implication

For patients requiring more intensive management of obesity, consider referral to a pediatric obesity specialist center for pharmacologic therapy.

Adults

Candidates for pharmacotherapy include patients with BMI ≥30 kg/m^2 (or 25 kg/m^2 in specific populations including Asians), or BMI 27 kg/m^2 in patients with weight-related comorbidities (i.e., diabetes, hypertension, or hyperlipidemia, other obesity complications including obstructive sleep apnea, NAFLD, and osteoarthritis), who have not lost at least 5% body weight after 3-6 months of a comprehensive lifestyle and behavioral modification intervention a (i.e., DPP, March Wellness) and remain within BMI criteria for consideration of initiating pharmacological weight loss therapy (**Strong Recommendation, Moderate Quality Evidence**). [1-3, 47, 48]

FDA approved pharmacotherapy for long-term treatment of obesity in adults includes semlaglutide 2.4 (Wegovy), setmelanotide (Imcivree), liraglutide 3.0 (Saxenda), orlistat (Xenical), phentermine-topiramate (Qsymia), and naltrexone-bupropion (Contrave). Pharmacotherapy should be initiated as monotherapy where possible, although approved fixed combinations are also available. In general, either semaglutide 2.4 or liraglutide 3.0 may be considered as a first-line option, but based on discussions with patients regarding preference and cost, other approved medications are also acceptable (**Conditional Recommendation, Low Quality Evidence**). [1, 3, 46, 47, 49, 50]

Clinicians and patients should consider the benefits and harms for each patient based on social and clinical contexts (i.e., comorbidities, ability to adhere to lifestyle and behavioral programs, insurance coverage), and clearly present expected health and weight-loss outcomes of treatment (Appendix A) (**Strong Recommendation, Moderate Quality Evidence**). [42]

When treating specific comorbidities, consider effects of medications on weight when determining approach to chronic disease management (i.e., choosing therapies that are weight neutral or result in weight loss rather than weight gain, especially for hypertension, diabetes, depression, and autoimmune disorders) (**Strong Recommendation, Moderate Quality Evidence**). [1]

Use of older sympathomimetics (e.g., dethylpropion) are generally not recommended due to higher side-effect risks (**Conditional Recommendation, Low Quality Evidence**). [1, 3, 47]

Monitor patient's weight and vital signs (BP / HR) for signs and symptoms of side effects every 6 weeks for the first 3 months of treatment. If tolerated and no side effect emerge, follow-up may be extended to every 4 to 6 months at the discretion of the prescribing provider. Baseline and yearly lipid and HA1c levels are also suggested. Consider tapering and discontinuing pharmacologic therapy if no weight loss (defined as < 5% from lifetime maximum weight) or appetite control response occurs within 4 to 6 months of initiation, or switch to another option including combination therapy if patient and physician believe benefits outweigh risks. One exception in which shared decision making might allow continued weight loss medication usage is the patient who had been clearly experiencing yearly unwanted weight gain prior to medication initiation but achieves weight stabilization with < 5% total weight loss **(Consensus)**.

Patients with diabetes on insulin or insulin secretagogues (i.e., glyburide, glipizide, glimepiride, repaglinide, and nateglinde) should check blood glucose daily during initiation and doses of these medications should be downwardly titrated as indicated to avoid hypoglycemia **(Consensus).**

It is recommended that women of child-bearing years who are sexually active engage in some form birth control while taking these medications. They should be stopped in women who are pregnant or are activity attempting to become pregnant and during lactation. Once breast feeding is completed, they may be restarted **(Consensus)**.

Off-Label Use of Medications for Weight Loss

Several medications have been studied in randomized, controlled trials and shown to result in weight loss that is sustained for six months or longer but have not gone through the process of FDA approval for long-term use. These include Phentermine (Lomaira, Adipex-P), which is FDA approved as an individual drug for weight management "for a few weeks," topiramate (Topamax), bupropion (Wellbutrin), metformin (Glucophage), and zonisamide. Because no long-term data is available on their safety and efficacy for this indication, no recommendation can be made regarding their use in weight management. However, if these generic medications are used off-label for the long-term management of weight in either pediatric or adult patients (e.g., phentermine and topiramate instead of Qsymia or buproprion and naltrexone instead of Contrave), it is recommended that the guidelines for eligibility and stopping be the same as for FDA-approved medications, and that practitioners schedule routine follow-up visits every three to six months for monitoring for efficacy and tolerability for the duration of their use **(Consensus)**. [51-58]

Practice Implication

- When prescribing, check what medications are covered on patient's insurance.

Surgical Intervention and Weight-Loss Devices

The evidence for safe and efficacious metabolic and bariatric surgery is based on comprehensive care in multidisciplinary clinics involving experts on surgical obesity management, medical obesity management, mental health, nutrition, and exercise science in addition to surgeons **(Strong Recommendation; Moderate Quality Evidence)**. [3, 19, 59, 60]

Adults

Patients with a BMI of ≥40 kg/m2 without coexisting medical problems and for whom the procedure would not be associated with excessive risk should be eligible for bariatric surgery **(Strong Recommendation; Moderate Quality Evidence).** [1-3, 9, 19, 25, 61]

Patients with a BMI of ≥35 kg/m2 and 1 or more severe obesity-related complications, including type 2 diabetes, hypertension, obstructive sleep apnea, obesity-hypoventilation syndrome, Pickwickian syndrome, nonalcoholic fatty liver disease or nonalcoholic steatohepatitis, pseudotumor cerebri, gastroesophageal reflux disease, asthma, venous stasis disease, severe urinary incontinence, degenerative arthritis, or considerably impaired quality of life may also be considered for a bariatric surgery procedure. Patients with BMI of 30 to 34.9 kg/m2 with diabetes or metabolic syndrome may also be considered for a bariatric procedure, although current evidence is limited by the number of patients studied and lack of long-term data demonstrating net benefit. **(Strong Recommendation; Moderate Quality Evidence).** [1-3, 9, 19, 25, 61]

Endoscopic procedures such as gastric balloon placement can be used in patients with severe obesity as a temporary bridge to traditional bariatric surgery or to allow unrelated interventions that are unable to be performed because of weight limits (ie, orthopedic surgery, organ transplantation) **(Conditional Recommendation; Low Quality Evidence).** [62, 63]

Practice Implication

- Discuss with patients that endoscopic procedures are not currently covered in Oregon

Adolescents

Suggest against bariatric surgery in preadolescent children, pregnant or breast-feeding adolescents (and those planning to become pregnant within 2 years of surgery), and in any patient who has not mastered the principles of healthy dietary and activity habits and/or has an unresolved substance abuse, eating disorder, or untreated psychiatric disorder **(Strong Recommendation; Low Quality Evidence).** [9]

Suggest bariatric surgery only if the patient has reached puberty and has a BMI of > 40 kg/m2 or has a BMI of >35 kg/m2 and significant comorbidities. Bariatric surgery should only be considered when lifestyle interventions have not been effective. Severe obesity places the adolescent at higher risk for liver disease, type 2 diabetes mellitus, dyslipidemias, sleep apnea, orthopedic complications, and mental health conditions **(Conditional Recommendation; Low Quality Evidence)**. [9, 18, 60, 64]

Determination of eligibility for bariatric surgery involves a thoughtful, shared decision-making process between the patient, parent(s) or guardian(s), and medical and surgical providers **(Consensus based on external guideline)**. [60]

- Evaluation of the adolescent for bariatric surgery should involve a thorough mental health evaluation by a mental health professional

Practice Implication

- Discuss with adolescent patients that metabolic and bariatric surgery is not currently covered in Oregon for their age group.

Management of co-morbidities

Weight loss and behavior change through multicomponent lifestyle interventions is the cornerstone of managing comorbidities in patients with overweight and obesity. The benefits of weight loss include reduction in risks and rates of weight-related comorbidities, including dyslipidemia, prediabetes and type 2 diabetes, hypertension, cardiovascular disease, non-alcoholic fatty liver disease, polycystic ovary syndrome, depression, and others. Regardless of comorbidity, all patients should be referred to a multicomponent lifestyle intervention to address overweight and obesity as first-line therapy, or in conjunction with management of other diseases **(Consensus)**. [65, 66]

When treating specific comorbidities, consider effects of medications on weight when determining approach to chronic disease management (i.e., choosing therapies that are weight neutral or result in weight loss rather than weight gain, especially for hypertension, diabetes, depression, and autoimmune disorders; see Pharmacologic Therapy section for additional details) **(Consensus)**. [65, 66]

Step 5: Engagement

Engagement by health care providers with the person with overweight and obesity in continued follow-up and reassessments, with encouragement and advocacy to improve care for these chronic diseases and their complications. [4]

Follow-up

The primary goal of treatment is long-term weight reduction and improvement in overall health, as well as minimizing or reducing risks of comorbidities. However, the establishment of permanent healthy lifestyle habits is still considered a good outcome, regardless of weight change, because of the long-term health benefits of these behaviors. Improvement in medical conditions is also an important sign of long-term health benefits **(Consensus)**. [18]

Obesity is a chronic disease requiring lifelong commitment to treatment and long-term maintenance. Strategies for weight maintenance after successful loss may require different strategies, flexibility and willingness to try different approaches is recommended. Ongoing frequent contact in person or by telephone can improve successful weight maintenance. Strategies should include assessing effect on co-morbidities, regular monitoring of weight, reinforce lifestyle modification, and address other risk factors **(Strong Recommendation; Moderate Quality Evidence)**. [1, 19, 25]

Post-bariatric surgery

Adolescents

Coordinate pre- and post-operative care with the patient, family, and multidisciplinary, anesthesia and surgical teams **(Consensus)**. [60, 64]

Monitor patients postoperatively for micronutrient deficiencies and consider providing iron, folate, and vitamin B12 supplementation as needed **(Strong Recommendation; Moderate Quality Evidence)**. [60, 64]

Monitor patients postoperatively for risk-taking behavior and mental health problems **(Consensus)**. [60]

It is important that adolescents with preoperative depression be monitored for recurrence of depression postoperatively **(Consensus)**. [64]

Adults
The frequency of follow-up depends on the bariatric procedure performed and the severity of co-morbidities **(Conditional Recommendation; Very Low Quality Evidence)**. [59]

Following LAGB, frequent nutritional follow-up and/or band adjustments are important for maximal weight loss **(Conditional Recommendation; Low Quality Evidence)**. [59]

Significant weight regain or failure to lose weight should prompt evaluation for (a) decreased patient adherence with lifestyle modification, (b) evaluation of medications associated with weight gain or impairment of weight loss, (c) development of maladaptive eating behaviors, (d) psychological complications, and (e) radiographic or endoscopic evaluation to assess pouch enlargement, anastomotic dilation, formation of a gastrogastric fistula among patients who underwent a RYGB, or inadequate band restriction among patients who underwent a LAGB **(Conditional Recommendation; Low Quality Evidence)**. [59]

Interventions should first include a multidisciplinary approach, including dietary change, physical activity, behavioral modification with frequent follow up; and then if appropriate, pharmacologic therapy and/or surgical revision **(Conditional Recommendation; Low Quality Evidence)**. [5]

In patients with or without complete resolution of their T2D, dyslipidemia or hypertension, continued surveillance and management should be guided by current clinical practice guidelines for those conditions **(Conditional Recommendation; Very Low Quality Evidence)**. [59]

Routine metabolic and nutritional monitoring is recommended after all bariatric surgical procedures **(Strong Recommendation; Moderate Quality Evidence)**. [59]

Patients should be advised to incorporate moderate aerobic physical activity to include a minimum of 150 minutes per week and goal of 300 minutes per week, including strength training 2 to 3 times per week **(Strong Recommendation; Moderate Quality Evidence)**. [59]

All patients should be encouraged to participate in ongoing support groups after discharge from the hospital **(Strong Recommendation; Moderate Quality Evidence)**. [59]

Obesity Management Clinical Framework		
Level of Intervention	Goals	Methods
Prevention *Who:* Appropriate for all patients	Prevent overweight or obesity from occurring	*What:* **Educate and promote healthy eating and regular physical activity** *Where:* Primary Care; Community Partners - Sustainable partnership with community resources to address health inequities such as schools, city planning, parks and recreation, nutritional programs, etc.
Initial Practice Management *Who:* Patients having overweight or obesity who would benefit from initial practice interventions.	Halt the progression of disease from its early stage prior to complications to a more severe stage	*What:* **Team-based structured lifestyle intervention** following the chronic care model. Interventions for patients with overweight and obesity include: First steps for pediatric and adult patients • Behavioral counseling • Nutrition • Physical Activity Additional options for consideration depending on patient age and disease severity: • Initial pharmacologic therapy for adult patients with obesity. For pediatrics, consider referral to Multidisciplinary Clinic. • Counseling on bariatric surgery options for adolescent and adult patients with severe obesity or type 2 diabetes *Where:* Primary Care for Screening; Lifestyle counseling; Determine appropriate medication therapy for use in primary care; Referral to bariatric surgery for appropriate patients.
Comprehensive Multi-disciplinary Intervention *Who:* Patients with severe obesity and obese patients with one or more obesity-related complications, or patients who were unresponsive to initial practice management interventions or are refractory.	Treat with combination weight-loss therapy to eliminate or ameliorate obesity-related complications and prevent disease progression	*What:* **Comprehensive multi-disciplinary intervention** treating patients with lifestyle interventions plus combination weight-loss medications, and consideration for referral to bariatric surgery. *Where:* Multidisciplinary Clinic. Comprehensive approach including additional specialties to collaborative with for harmonized treatment plans – Additional specificities include Pulmonology; Gastroenterology; Nephrology; Cardiology; Physical Therapy; Psychology

Quality Measures:

Process

- Number of times vitals are entered (exercise/nutrition):
  - *Change in exercise or daily services of fruits and vegetables*
- Number of times patients are referred to:
  - *Bariatric surgery*
  - *Rx*
  - *Provided educational resources (e.g AVS)*
  - *Integrated team based treatment (doc, nutritionist, BH etc.)*

Outcome

- Adult BMI assessment (NQF 421)
- Weight assessment and counseling for nutrition and physical activity for children and adolescents (NQF 0024)
- A1C and/or HTN control
- Decreased utilization of medication
  - *E.g Metformin*
- Utilization
  - *ED*
  - *Hospitalization*
- Screen time

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Guideline Preparation

This guideline was prepared by the Office of Clinical Integration (CI) and Evidence-Based Practice (EBP) in collaboration with content experts across OHSU Healthcare.

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Development Process

This guideline was developed using the process outlined in the CI and EBP Manual (2016). The review summary documents the following steps:

1. Review Preparation
   - PICO questions established
   - Evidence search confirmed with content experts
2. Review of Existing Internal and External Guidelines
   - Literature Review of Relevant Evidence
3. Critically Analyze the Evidence
4. Summarize the Evidence by preparing the guideline, and order sets

Evaluating the Quality of the Evidence

Published clinical guidelines were evaluated for this review using the **University of Pennsylvania's Trustworthy Guideline Rating Scale**. The summary of these guidelines are included in the evidence summary. The rating scale is based on the Institute of Medicine's "Standards for Developing Trustworthy Clinical Practice Guidelines" (IOM), as well as a review of the AGREE Enterprise and Guidelines International Network domains. This scale evaluates a guideline's transparency, conflict of interest, development group, systematic review, supporting evidence, recommendations, external review and currency and updates. The purpose of this scale is to focus on the weaknesses of a guideline that may reduce the trust a clinical user can have in the guideline, and distinguish weaknesses in documentation (e.g. guideline does not have a documented updating process) from weaknesses in the guidance itself (e.g. recommendations are outdated).

The **GRADE (Grading of Recommendations, Assessment, Development and Evaluation)** criteria

were utilized to evaluate the body of evidence used to make clinical recommendations. The table below defines how the quality of the evidence is rated and how a strong versus conditional recommendation is established. The evidence summary reflects the critical points of evidence.

Recommendation	
STRONG	Desirable effects clearly outweigh undesirable effects or vice versa
WEAK	Desirable effects closely balanced with undesirable effects
Quality	**Type of Evidence**
High	Consistent evidence from well-performed RCTs or exceptionally strong evidence from unbiased observational studies
Moderate	Evidence from RCTs with important limitations (e.g., inconsistent results, methodological flaws, indirect evidence, or imprecise results) or unusually strong evidence from unbiased observational studies
Low	Evidence for at least 1 critical outcome from observational studies, from RCTs with serious flaws or indirect evidence
Very Low	Evidence for at least 1 critical outcome from unsystematic clinical observations or very indirect evidence

Recommendations

Recommendations for the guidelines were directed by the existing evidence, content experts, and consensus. Patient and family preference were included when possible. When evidence is lacking, options in care are provided in the guideline and the order sets that accompany the guideline.

Approval Process

Guidelines are reviewed and approved by the Content Expert Team, Office of CI and EBP, Knowledge Management and Therapeutics Committee, Professional Board, and other appropriate hospital committees as deemed appropriate for the guideline's intended use. Guidelines are reviewed and updated as necessary every 2 to 3 years within the Office of CI and EBP at OHSU. Content Expert Teams will be involved with every review and update.

Disclaimer

Guideline recommendations are made from the best evidence, clinical expertise and consensus, in addition to thoughtful consideration for the patients and families cared for within the Integrated Delivery System. When evidence was lacking or inconclusive, content experts made recommendations based on consensus. Expert consensus is implied when a reference is not otherwise indicated.

The guideline is not intended to impose standards of care preventing selective variation in practice that is necessary to meet the unique needs of individual patients. The physician must consider each patient and family's circumstance to make the ultimate judgment regarding best care.

Appendix A: Pediatric Patients Medical Assessments

For pediatric patients with severe obesity, consider assessing co-morbidity risk with the following (Consensus):

- Hemoglobin A1C
- Lipid panel (Non-fasting okay. Repeat fasting if triglyceride levels increased)
- ALT/AST
- Sleep Study

Appendix B: Elements of Adult Medical Assessment of Overweight and Obesity

Adult Medical Assessment of Overweight and Obesity:

- Weight history with attention to life transitions (puberty, pregnancy, menopause for women), weight maximum (outside or pregnancy), and previous weight loss attempts
- Current lifestyle practices (diet, activity levels), including medical conditions or circumstances that limit food choices or exercise
- Presence of medical conditions or prescription medications that are complications of or contribute to overweight and obesity
- Current motivation for, and barriers to, weight loss
- Current and past psychiatric history, especially use of psychiatric meds that cause weight gain
- History of eating disorder
- Over-the-counter and prescription medication use
- Alternative and complementary therapy use
- Substance use
- Family history and obesity in family members
- Social history including support systems

Physical examinations of patients with overweight or obesity include:

- Height and weight
- Calculated BMI
- Measurement of waist circumference
- Blood pressure, pulse rate

Laboratory tests may be obtained as clinically appropriate based on medical history and physical examination. These may include:

- Renal function (creatinine, eGFR)
- AST/ALT
- Lipid panel (Non-fasting okay. Repeat fasting if triglyceride levels increased)
- Hemoglobin A1C
- TSH
- Urinalysis (e.g proteinuria)

DATE: October 2021

Appendix C: Adult pharmacologic management of obesity, in conjunction with diet, exercise, and behavior modification [1, 3, 47]

Name MOA Population	Dosing and Monitoring	AEs	Precautions and Notes
Semaglutide 2.4 • GLP-1 agonist BMI ≥30 kg/m^2, or BMI ≥27 kg/m^2 with ≥1 weight-related comorbidity	• Initial: 0.25 mg subQ qwk • Titrate: increase dose at monthly intervals (0.5, 1.0, 1.7) until 2.4mg qwk • Re-evaluate after 16 weeks; if weight loss ≤4% after 16 weeks, or 2.4 mg/week is not tolerated, discontinue use • May need to reduce dosage of insulin or oral hypoglycemics	• Common: Nausea, vomiting, diarrhea, constipation, hypoglycemia (in T2D patients using sulphonylureas or insulin), headache, dyspepsia, injection site reactions, increased lipase, increased heart rate • Less common: Gallbladder disease, renal impairment, hypoglycemia, suicidal behavioral and ideation	• Contraindicated during pregnancy, patients with personal/family history of medullary thyroid cancer, multiple endocrine neoplasia 2A or 2B, patients using other GLP-1 agonists or insulin • Monitor for signs of medullary thyroid cancer, pancreatitis, gall bladder disease, hypersensitivity reactions, suicidal behavior and ideation • Delays gastric emptying; may impact absorption of other oral meds

Setmelanotide
• Melanocortin 4 receptor (MC4R) agonist
  • Monogenetic obesity disorders resulting from mutations in pro-opiomelanocortin (POMC), proprotein convertase subtilisin/kexin type 1 (PCSK1), or leptin receptor (LEPR) deficiency
  • ages 6 or older
	Pediatric - ages ≥6 years to <12 years:
	
	• Initial: 1 mg subQ daily for 2 weeks then adjust dose based on efficacy and safety
	• Up-titration: If receiving 0.5 mg dosage, increase to 1 mg once daily; if receiving 1 mg dosage, increase to 2 mg once daily; if receiving 2 mg dose, increase to 3 mg once daily.
	• Down-titration: If receiving the 1 mg dosage, reduce to 0.5 mg once daily; if receiving the 2 mg dosage, reduce to 1 mg once daily; if receiving the
		• Common: injection site reactions, hyperpigmentation, gastrointestinal symptoms (eg, abdominal pain, nausea, vomiting, constipation, diarrhea), dizziness, vertigo, flu-like symptoms, pain syndrome, alopecia
		• Less common: disturbances in sexual arousal (eg, spontaneous penile erection, priapism, labial hypersensitivity), suicidal behavioral and ideation
			• Avoid use in renal impairment (eGFR <60 mL/min)
			• Avoid in pregnancy and lactation

	3 mg dosage, reduce to 2 mg once daily. Pediatric – ages ≥12 years: refer to adult dosing Adult • Initial: 2 mg subQ daily for 2 weeks then adjust dose based on efficacy and safety • Up-titration: If receiving if receiving 2 mg dose, increase to 3 mg once daily; if receiving the 1 mg dosage, increase to 2 mg once daily. • Down-titration: if receiving the 2 mg dosage, reduce to 1 mg once daily; if receiving the 3 mg dosage, reduce to 2 mg once daily. Discontinue therapy if 5% weight loss (based on baseline body weight or BMI) has not been achieved after 12 to 16 weeks of therapy		
Liraglutide 3.0 • GLP-1 agonist • BMI ≥30 kg/m^2, or BMI ≥27 kg/m^2 with ≥1 weight-related comorbidity	• Initial: 0.6 mg subQ qd • Titrate: increase dose at weekly intervals (1.2, 1.8, 2.4 mg) until 3 mg qd • Re-evaluate after 16 weeks; if weight loss ≤4% after 16 weeks, or 3 mg/week is not tolerated, discontinue use • May need to reduce dosage of insulin or oral hypoglycemics	• Common: Nausea, vomiting, diarrhea, constipation, hypoglycemia (in T2D patients using sulphonylureas or insulin), headache, dyspepsia, injection site reactions, increased lipase, increased heart rate • Less common: Gallbladder disease, renal impairment, suicidal behavioral and ideation	• Contraindicated during pregnancy, patients with personal/family history of medullary thyroid cancer, multiple endocrine neoplasia 2A or 2B, patients using other GLP-1 agonists or insulin • Monitor for signs of medullary thyroid cancer, pancreatitis, gall bladder disease, hypersensitivity reactions, suicidal behavior and ideation • Delays gastric emptying; may impact

			absorption of other oral meds
Orlistat • Pancreatic lipase inhibitor • BMI ≥30 kg/m^2, or BMI ≥27 kg/m^2 with ≥1 weight-related comorbidity	• Prescription and OTC • 120 mg tid with fat-containing meals • 60 mg tid for those not tolerating 120 mg dose • Should take daily multivitamin with A, D, E, K, and beta-carotene 2 hours before/after orlistat • May need to reduce dosage of insulin or oral hypoglycemics	• Common: cramps, flatulence, oily spotting, fecal incontinence • Less common: hepatic or renal injury	• Contraindicated during pregnancy, in patients with chronic malabsorption syndrome or cholestatis • May reduce absorption of fat-soluble vitamins, cyclosporine • Monitor patients on levothyroxine for changes in thyroid function (take 4 hrs apart), warfarin for coagulation (3 hrs apart), and anti-epileptics for convulsions
Phentermine • Centrally-acting adrenergic agonist • BMI ≥30 kg/m^2, or BMI ≥27 kg/m^2 with ≥1 weight-related comorbidity	• Immediate release: 8 mg tablets (Lomaira) up to TID, 37.5 mg tablets (Adipex-P) qd or divided 18.75 mg BID; 15 mg and 30 mg capsules • Orally disintegrating tablets: 15, 30, or 37.5 mg qd in morning • May need to reduce dosage of insulin or oral hypoglycemics	• Increase in heart rate or blood pressure, insomnia, dry mouth, constipation, nervousness, impaired ability to engage in operating machinery or drive • Potential for addiction	• Contraindicated during pregnancy or nursing; in patients with history of CVD (CAD, stroke, arrhythmia, CHF, un- or poorly controlled HTN), untreated hyperthyroidism, MAOI use, glaucoma, agitation • Current FDA approval limited to short term use, although approved for longer-term use in combination tablet with topiramate (see below) • Avoid in patients <16 years and >65, and patients with pulmonary HTN, history of substance addiction or abuse, renal impairment • May counteract efficacy of BP medications

			• DEA schedule C-IV, low abuse potential as amphetamine derivative
Phentermine-topiramate • 5HT-2C receptor agonist • BMI ≥30 kg/m^2, or BMI ≥27 kg/m^2 with ≥1 weight-related comorbidity	• Initial 3.75 mg phentermine / 23 mg topiramate qd in am for 2 weeks, then increase to 7.5mg/46 mg T qd for 12 weeks • If ≤3% weight loss after 12 weeks on 7.5 mg/46 mg, escalate dose to 11.25 mg/69 mg for 14 days, followed by 15mg/92mg for 12 weeks, or discontinue • If ≤5% weight loss after 12 weeks on maximum dose of 15 mg/95 mg qd, discontinue • To discontinue: taper dose over minimum 1 week, every other day dosing, to reduce risk of seizure • If moderate hepatic (C-P score 7-9) or moderate to severe renal impairment (CrCl <50 mL/min), max dose 7.5 mg/46 mg • May need to reduce dosage of insulin or oral hypoglycemics	• Dry mouth, constipation, paraesthesias, depression, anxiety, taste disturbance, elevated heart rate or blood pressure, cognitive disturbances, insomnia (at higher doses) • Potential for metabolic acidosis and kidney stones from renal bicarbonate loss (topiramate) • Teratogenic (increased risk of oral cleft defects) (topiramate) • Potential for addiction	• Contraindicated in pregnancy or during nursing, patients using ergot derivatives or MAOIs, patients with hyperthyroidism, severe hepatic impairment, glaucoma • Women of childbearing potential: negative pregnancy test prior to/during treatment and 2 forms of contraception required • Monitor for increased heart rate, suicidal behavior and ideation, glaucoma, mood or sleep disorders, metabolic acidosis, elevated creatinine • Caution with CNS depressants, non-potassium sparing diruetics • DEA schedule C-IV, low abuse potential of phentermine as amphetamine derivative
Bupropion-naltrexone • Opioid antagonist + aminoketone antidepressant (POMC neuron activator) • BMI ≥30 kg/m^2, or BMI ≥27 kg/m^2 with ≥1 weight-related comorbidity	• Week 1: 8 mg naltrexone / 90 mg bupropion qd in am • Week 2: 8 mg/90 mg in am and pm • Week 3: 2x 8 mg/90 mg in am, 1x in pm • Week 4 and beyond: 2x in am, 2x in pm • Do not take with high-fat meal • In mod to severe renal impairment, max dose 1	• Nausea, constipation, headache, vomiting, insomnia, dry mouth, dizziness, diarrhea, elevated heart rate or blood pressure • Siezures in those with a history of these • Renders narcotics ineffective	• Contraindicated in pregnancy, uncontrolled HTN, chronic opioid use, seizure disorders, anorexia or bulimia, MAOI use, using other products with bupropion, abrupt withdrawal of alcohol, benzos, or antiepileptics • If patient in smoking cessation, caution re:

	tablet 2x daily; not recommended in ESRD • In hepatic impairment, max dose is 1 tab daily. • May need to reduce dosage of insulin or oral hypoglycemics		neuropsychiatric events • Monitor for suicidal ideation or behavior, BP and HR, hepatotoxicity, glaucoma, hypoglycemia in patients taking antidiabetics • May increase effects of SSRIs, TCAs, antipsychotics, beta-blockers, antiarrhythmics • May decrease effects of digoxin • Efficacy of B-N may be reduced by CYP2B6 inducers (e.g., ritonavir, lopinavir, efavirenz, phenobarbital) • Concentration of B-N may be increased by CYP2B6 inhibitors (e.g., ticlopidine, clopidogrel) • Consider avoiding in patients using drugs to lower seizure threshold, dopaminergic drugs, or in patients taking drug tests for amphetamines

Notes: Weight-related comorbidities include hypertension, dyslipidemia, type 2 diabetes; serotoninergic agents include SSRIs, SNRIs, MAOIs, triptans, bupropion, tramadol, TCAs, lithium, dextromethorphan, St. John's Wort; orlistat 60 mg (Alli) available OTC.

Appendix D: Gaps in Evidence and Future Research Needs

The Content Expert Panel identified gaps in evidence supporting the steps in this document. Content Expert Panel recommendations for future research are summarized below.

Current literature does not specifically evaluate the superiority of any one approach for discussing overweight or obesity with patients to assess provider or patient satisfaction with the care being provided, or the patients' mental or physical health outcomes. Likewise, there

is no literature that evaluate the effect of weight bias training among clinicians and other health care staff on provider or patient satisfaction. Finally, more information is needed to address the extent to which weight stigma contributes to the health outcomes associated with obesity.

Given the present evidence review, future research in this area should address the following issues:

1. How are health outcomes impacted by different approaches to health and well-being? Studies should specifically compare patient-centered outcomes associated with weight-normative care (emphasizing weight and weight loss when defining health and well-being) versus weight-inclusive care (emphasizing health and well-being as multifaceted while directing efforts toward improving health access and reducing weight stigma)?
2. Does weight bias training improve provider or patient satisfaction with care? If so, are there differences in these outcomes among various types of training?
3. What are the effects of weight stigma, racism, poverty, gender discrimination, and other socioeconomic stressors on patient outcomes when controlling for factors including obesity and vice-versa? Clearer understanding of these separate variables will guide development of health and public policy to better address issues pertaining to public health.