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Strategies to Manage Obesity: Lifestyle

REVIEW

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ABSTRACT

The treatment of obesity and cardiovascular disease (CVD) is complex, and a variety of strategies are effective in the lifestyle interventions associated with these disease states. An interdisciplinary approach is the most effective treatment with the best results and outcomes. The lifestyle management of obesity includes interventions in nutrition, exercise, and behavioral health—all key components in managing most chronic illnesses. Effective nutrition interventions include the Mediterranean diet, DASH diet, and incorporation of more plant-based food options. Exercise is tailored to individual needs and emphasizes a gradual progression and incremental change with both aerobic and resistance training to manage weight and cardiovascular disease. Behavioral health focuses on practicing mindfulness, active self-awareness, sleep quality, stress management, and the use of therapy in overcoming barriers to success. These lifestyle factors are key in managing weight and cardiovascular disease.

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INTRODUCTION

Obesity is complex and commonly misunderstood as a disease. The Centers for Disease Control (CDC) defines obesity as having a Body Mass Index (BMI) at or above 30 kg/m^2 but in general, it is defined as being above the weight that is considered healthy for an adult's height.[1] The CDC estimates that as of 2023, in about half of the United States (US), one in three individuals is considered to have obesity.[1] Many interventions exist for the treatment of obesity, but this paper focuses on the lifestyle interventions that are essential in complementing any medical or surgical treatments prescribed by physicians. The treatment of obesity with lifestyle interventions should be interprofessional and include the following components: nutrition education, exercise prescription, and behavioral health interventions.[2]

DIET AND CARDIOVASCULAR HEALTH

Lifestyle choices, including dietary patterns, are the foundation of chronic disease prevention and management.[3] Despite development of new medical treatment strategies, improved access to health care, and increased healthcare spending, the rate of CVD-related mortality reduction has slowed.[4] This may be related to increasing numbers of people with obesity, type 2 diabetes mellitus (T2DM), and younger individuals with multiple health conditions or comorbidities.[5] The link between a low-quality diet, being overweight or obese, and disease state cannot be ignored. Healthy dietary patterns are vital to primary and secondary prevention of hyperlipidemia, hypertension (HTN), T2DM, and CVD.[4,5] Providing science-based lifestyle recommendations may help those at risk for CVD modify their dietary patterns, thereby potentially decreasing the incidence of CVD. Dietary patterns refer to all foods and beverages consumed, whether they are prepared and consumed at home or outside of the home. Healthy dietary patterns encompass food balance, variety, and overall types of foods and beverages consumed.[6] The nutrition recommendations from the American Heart Association (2021) and the 2020-2025 Dietary Guidelines for Americans provide guidance on intake patterns that are beneficial to health (Table 1).[6,7]

Research shows low-nutrient, high-fat, energy-dense diets accompanied by inadequate intake of nutrient-rich foods are proinflammatory and associated with an increased prevalence of heart disease.[3] The dietary patterns with the most evidence of CVD prevention are the Mediterranean diet, the Dietary Approaches to Stop Hypertension (DASH), and the plant-based diet.[8] While the three eating patterns coincide on the benefits of frequent and varied intake of whole grains, fruits, vegetables, and lean proteins, they each have a unique element that sets them apart from the other diets.

The Mediterranean diet highlights intake of poly- and monounsaturated fats from extra virgin olive oil (EVOO), nuts, and fish. This diet promotes a favorable balance between omega-6 and omega-3 polyunsaturated fatty acids (PUFAs).[5] These heart-healthy fats often replace intake of saturated and trans fats found in Western dietary patterns, and research finds that reduced saturated fat intake along with replacement with unsaturated fats provide the greatest cardiovascular (CV) benefit.[5] The phenolic compounds in EVOO improve antioxidant capacity and activate anti-inflammatory pathways. The Mediterranean diet can also improve gut microbiota due to its focus on prebiotic and probiotic foods, as well as high fiber foods that generate short-chain fatty acids

American Heart Association Guidance Statement (2021)	• Variety of fruits and vegetables • Whole-grain foods and products • Healthy protein of plant or low-fat animal source • Liquid plant oils • Minimally processed foods • Beverages free of added sugar • Foods prepared with minimal or no salt • Minimal or no alcohol intake Follow these recommendations regardless of place of preparation or consumption
2020-2025 Dietary Guidelines for Americans	• Vegetables of all kinds, colorful non-starchy vegetables; beans, peas, lentils and other starchy vegetables • Whole fruits • Whole grains • Low-fat or fat-free dairy products • Lean proteins including meats, poultry and eggs, seafood and plant-based foods like beans, peas, lentils, nuts and seeds, and soy products • Vegetable oils and oils in foods from seafood and nuts • Limited intake of added sugars, saturated fat, sodium, and alcohol

Table 1 American Heart Association Guidance Statement (2021) and 2020-2025 Dietary Guidelines for Americans.[6,7]

DIETARY PATTERN	ADVANTAGES	DISADVANTAGES
Keto or low carbohydrate	• Weight, body fat, and BMI reduction • Improved insulin resistance • Glycemic control • Increased satiety and appetite control • Decreased muscle loss • Improved blood pressure	• Increased TC, LDL-C, HDL-C • Increased TG • Potential for increased inflammation and blood pressure • May be difficult to maintain in long term
Intermittent fasting	• Weight and BMI reduction • Reduced waist circumference • Reduced inflammatory biomarkers • Improved blood pressure • Improved TC, LDL-C, TG	• Limited evidence of cardiovascular benefits • May be difficult to maintain in long term
Calorie restricted	• Weight and BMI reduction • Decreased inflammatory biomarkers • Reduced TC, LDL-C, HDL-C and TG • Improved glucose regulation • Improved blood pressure (systolic and diastolic) • Reduced oxidative stress • Increased insulin sensitivity	• Potential for malnutrition • Possible muscle loss • May be difficult to maintain in long term

Table 2 Comparison of benefits and risks of dietary patterns in Keto or low carbohydrate, intermittent fasting, and calorie-restricted diets.[12] BMI: body mass index; TC: total cholesterol; LDL-C: low density lipoprotein cholesterol; HDL-C: high density lipoprotein cholesterol; TG: triglycerides

(SCFAs). Like the phenolic compounds in EVOO, SCFAs have an anti-inflammatory effect, making them beneficial to CV well-being. By design, the intake of refined grains, sugar, saturated fat, and red meat is limited or avoided in the Mediterranean diet.[8] Consumption of red meat is minimized, which may be beneficial to risk of CVD since red meat may lead to production of proatherogenic compounds.[3] The Mediterranean diet has also been shown to benefit genetically susceptible individuals by hindering the development of cardiometabolic pathways.[9]

The DASH diet, created in 1997 by the National Heart, Lung, and Blood Institute, focuses on prevention and treatment of HTN. The DASH diet recommends healthy eating patterns accompanied by reduced sodium intake of between 1,500 and 2,300 mg per day in contrast to the typical American diet, where an individual may consume an average of 3,400 mg of sodium per day.[10,11] Following the DASH diet recommendations may lead to a significant reduction in blood pressure, and there is a potential for weight reduction depending on overall energy consumption and level of physical activity.[10,12] A decrease in total cholesterol (TC) and low-density lipoprotein cholesterol (LDL-C) levels are associated with the DASH diet and may result in improved cardiac function, reduced risk of heart failure, and a reduced atherosclerotic CVD risk score (ASCVD).[3] In addition, the DASH diet has been shown to affect lipid profile with reduced LDL-C and triglyceride levels, which can decrease CV risk.[12]

Plant-based diets focus on the intake of whole grains, fruits, vegetables, nuts, and legumes along with minimal intake of animal-based foods, if any. Subsets of a plant-based diet include vegans, lacto-vegetarians, ovo-vegetarians, lacto-ovo vegetarians, and pesco vegetarians or semi-vegetarians. Emphasis is placed on frequent intake of vegetables, fruits, whole grains, nuts and legumes, resulting in lower calorie and saturated fats intake and increased consumption of fiber. Modifiable cardiometabolic risk factors like blood pressure, LDL-C, blood glucose levels, inflammatory markers, and weight status improve in those following a plant-based diet versus those consuming animal-based foods.[8] Furthermore, avoidance of animal-based foods may reduce atherosclerotic risk and contribute to a diverse gut microbiota.[9] Pulses, beans, and legumes are a highly nutritious, easily accessible, and economic food group found to greatly decrease CVD risk. Intake of pulses, beans, and lentils of any variety may improve the gut microbiome and decrease chronic low-grade inflammation.[9] They are low in omega 6 to omega 3 ratio, contribute to an improved lipid profile, can facilitate achieving a healthy weight, and improve glycemic control.[9] Healthful plant-based diets that focus on increased intake of vegetables, fruits, nuts, and whole grains are associated with lower CVD risk and mortality. However, plant-based diets with frequent intake of refined grains or foods high in fat, sugar, and sodium may have CVD risk comparable to animal-based diets. Highly processed foods may displace the intake of foods that benefit CV health, like fruits and vegetables, which may increase risk factors for developing CVD.[8] Additionally, the frequency of high-processed food consumption may also increase the risk of CVD incidence.[8]

IMPLEMENTATION

Additional dietary patterns have been studied to determine their impact on CV health, including keto or low carbohydrate diets, intermittent fasting, and calorie-restricted diets (Table 2). Currently, further research is needed to determine true benefits towards decreasing CV risk or improving its management.[8] These dietary approaches should ideally be implemented after full evaluation by a medical professional and continuous supervision.[12]

There are other factors that serve as barriers to heart-healthy diet implementation or adherence, including the marketing of unhealthy foods, food insecurity, neighborhood segregation, and structural racism.[6] Individuals with low socioeconomic status are likely to have poor access to the foods recommended for CV health due to financial, time scarcity, and environmental reasons.[4] Access to comprehensive and targeted nutrition education also affect a person's ability to make lifestyle modifications and maintain those changes in the long term. Counseling patients on cost-friendly alternatives, or strategies for maintaining healthy food options, may facilitate adherence to a heart-healthy diet.[4] A multidisciplinary team approach on dietary pattern modifications, specifically when the team includes a registered dietitian nutritionist (RDN) who can provide evidence-based nutrition recommendations, can help individuals improve cardiometabolic risk factors.[8,14] Nutrition counseling provided by an RDN or medical nutrition therapy (MNT) may result in reduced systolic and diastolic blood pressure, lower body weight, reduced need for antihypertensive medications, and decreased risk of stroke and the CVD risk score.[13] Individuals receiving MNT may achieve weight loss leading to a decreased risk of CVD, since obesity is an independent risk factor in CVD development and progression.[9]

The increasing prevalence of obesity in many countries is associated with an increasing incidence of T2DM, sleep disturbances, dyslipidemia, HTN, and CVD among other chronic diseases.[15] Obesity is also associated with chronic, low-grade inflammation and increased cytokine production, which may lead to further health complications especially in the presence of CVD.[9] Weight loss resulting from lifestyle changes can improve metabolic syndrome factors, systemic inflammation, and endothelial dysfunction.[15] Research indicates that weight loss of approximately 5% and 10% in a 6-month span may improve glycemic, blood pressure, and cholesterol levels. Individuals in the Look AHEAD (Association of Weight Loss Maintenance and Weight Regain on 4-Year Changes in CVD Risk Factors: the Action for Health in Diabetes) trial with ≥ 10% weight loss were found to significantly reduce CV events.[14,15] A variety of approaches to weight loss exist, including lifestyle changes and surgical or pharmacological approaches. Dietary interventions for weight loss usually include reduced caloric intake and possibly limitation or exclusion of certain macronutrients (low-carbohydrate, low-fat, high-protein) or food groups (vegetarian, vegan, or carnivore diets).[15] Following a time-restricted diet, like a fasting or intermittent fasting eating pattern, may also result in reduced calorie intake.

Among the most researched dietary approaches for weight loss are the keto diet, Atkins diet, paleo diet, intermittent fasting, and the vegetarian and vegan diets.[15] After successful weight loss, individuals face the challenge of maintaining a healthy weight, especially within the first year after weight loss, in part due to metabolic adaptation and shifts in the hunger and satiety hormones.[14] Additionally, lean body mass may decrease during weight loss, which may present an additional challenge to sustained weight management and long-term health.[15] For these reasons, and more that are not discussed in the scope of this article, it is recommended that long-term care and support for weight management are provided for a year at minimum to help individuals maintain weight loss.[15] A person with overweight or obesity wanting to achieve weight loss would benefit from working with a multidisciplinary team of health professionals to receive proper education on weight-loss approaches that will work best for them. In addition to weight-loss education and counseling, blood work to assess potential deficiencies, and primary medical care, follow-up messaging, and visits provide additional support.[15] Depending on the individual's needs, the support system may be set up for both short-term (days to weeks) or long-term (months to years).[15]

When an individual makes modifications to food choices and dietary patterns, any children or other family members in the household may also reap the health benefits of those changes.[4] The impact of referring to an RDN for nutrition counseling can improve CVD prevention and management and has the potential to significantly impact public health.[13]

THE ROLE OF EXERCISE IN OBESITY AND CVD MANAGEMENT

Exercise and physical activity play an important role in obesity management, long-term cardiovascular health, and improvements in a variety of different health markers. The World Health Organization recommends that adults aim to achieve 150 to 300 minutes per week of moderate intensity aerobic activity as well as at least two days a week of ≥ 60 min muscle-strengthening activity.[16] Unfortunately, only 22.7% of US adults meet the aerobic guidelines, and only 24.2% of adults meet both the aerobic and strength guidelines (Figure 1).[17] Low physical activity is associated

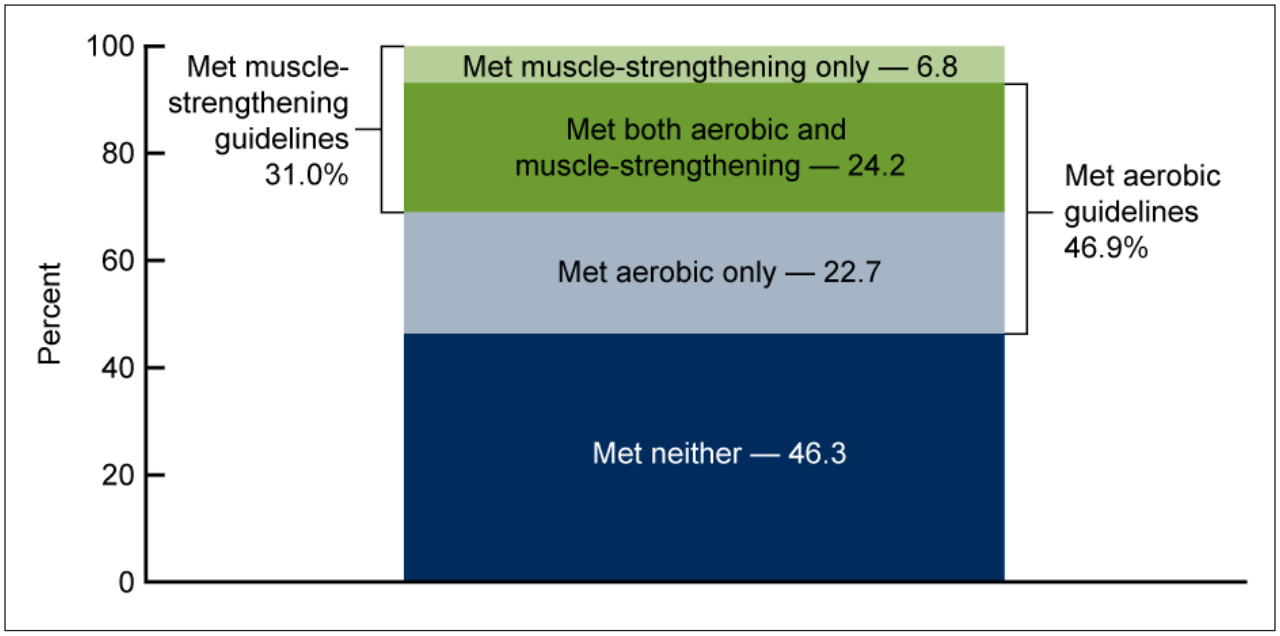

Figure 1 Percent distribution of adults aged 18 and over who met 2018 Physical Activity Guidelines for Americans for aerobic and muscle strengthening activities. Used with permission from Elgaddal et al. and CDC.[17]

with increased cardiovascular risk, obesity, cancer, T2DM, and all-cause mortality.[18] Regular physical activity reduces the risk of cardiovascular disease, improves health outcomes of individuals with pre-existing conditions such as obesity and type 2 diabetes, and can partially reverse chronic conditions and comorbidities related to sedentary lifestyles.[18]

CARDIOVASCULAR DISEASE

Cardiovascular disease remains the leading cause of death both globally and in the US, taking an estimated 17.9 million lives per year.[19] In the US alone, 702,880 individuals died from CVD in 2022, making up 1 in 5 deaths,[20] costing the US an estimated $251 billion per year, and leading to $156 billion per year in lost productivity.[21] Low physical activity is an independent predictor of cardiovascular risk, and regular physical activity is recommended for cardiovascular risk reduction and treatment for patients with myocardial infarction or heart failure.[22] Cardiovascular benefits of regular physical activity include reductions in resting heart rate and blood pressure, improved autonomic tone, weight loss, and other metabolic changes, resulting in improved lipid profiles and glucose tolerance.[22] It is also effective in reducing visceral adipose tissue deposits, which are associated with the highest cardiometabolic risk. In general, aerobic-based forms of exercise that focus on increasing heart rate and breathing rate proves to be more effective for specifically improving cardiovascular health than strength/resistance forms. From both a health and economic standpoint, the literature is clear on the effectiveness of exercise, specifically aerobic types, for both the improvement and prevention of CVD.

OBESITY

As of 2023, the prevalence of obesity (BMI > 30) in US adults over 20 was 41.9%, and prevalence of severe obesity (BMI > 40) was 9.2%.[23] It is well-established that obesity is correlated with a multitude of diseases (eg, CVD, T2DM, hypertension, metabolic syndrome). Exercise, when used in conjunction with a dietary caloric deficit, has been shown to be the most effective approach to successful weight loss and weight maintenance compared with exercise or diet alone. Regular physical exercise increases energy expenditure and leads to weight loss driven by reduction of adipose tissue, with maintained or increased skeletal muscle mass and bone density. This contrasts with weight loss driven by diet alone, where potential reductions in muscle strength and bone health may mitigate the overall health benefits.[22]

MAINTENANCE AND HEALTH

Although obtaining significant weight loss is achievable, 80% of individuals are unable to maintain it.[24] Physical activity has been shown to promote greater weight maintenance, with 250 to 300 minutes (or energy expenditure greater than or equal to 2000kcal) per week of moderate intensity exercise being shown as an effective dose of exercise to maintain weight.[24] Independent of weight loss, however, there is emerging evidence that exercise can be beneficial in improving a variety of different health markers, including the ones previously mentioned that are linked with obesity.[25] For example, exercise increases insulin sensitivity through several molecular pathways[18] as well as increasing blood glucose utilization, making it an effective tool for managing T2DM. With

significant weight loss, one of the most crucial concerns is loss of lean muscle tissue, which can be preserved by implementing resistance and muscle-strengthening exercise.[26] With these benefits in mind, exercise should not be overlooked as an effective addition to the treatment of obesity as well as related comorbidities.

IMPLEMENTATION

Implementation of an exercise intervention is oftentimes difficult for sedentary individuals. Many barriers exist for adults in the US, including access to a safe place to perform exercise training, equipment access, cost of memberships at facilities, travel, and time required, among other barriers.[27] However, even 10 minutes of physical activity is associated with improved health outcomes.[28] Utilization of smart technology such as wearable devices and smart phones have the ability to implement tailored activity schedules and targets while providing individualized feedback, making them a valuable tool to use in conjunction with an exercise intervention.[22] Even though medical doctors are aware of physical activity guidelines, with many regularly discussing them with patients, most physicians are not trained or knowledgeable regarding exercise plan construction, post-exercise recovery periods, pre- and post-exercise nutrition, or what constitutes "moderate" and "vigorous" exercise.[27] Exercise professionals such as physical therapists, exercise physiologists, and medical exercise specialists are also valuable resources to individuals seeking help with exercise implementation. It is crucial that healthcare professionals continue to encourage physical activity, no matter how small, among their patients, as the literature is clear on the benefits of exercise on health, longevity, and disease improvement and prevention.

BEHAVIORAL HEALTH INTERVENTIONS

Behavioral health interventions in the treatment of obesity and CVD are essential because all the lifestyle interventions previously discussed involve some type of behavior change for the patient. Behavior modification is the most effective way to ensure long-term success for weight loss and other chronic illnesses when it is added in conjunction with diet, exercise, medication, or surgical intervention. Failure to maintain weight through behavior modification will lead to weight regain regardless of intervention including medication and surgery.[5]

This next section focuses on the importance of practicing mindfulness, active self-awareness, educating on the importance of sleep quality, addressing stress management, and the use of therapy in overcoming barriers to success in the treatment of obesity.

MINDFULNESS AND SELF-AWARENESS

The American Psychological Association defines mindfulness as the ability to be aware of one's own internal psychological state and one's surroundings.[29] Self-awareness is defined as the ability to see oneself clearly and objectively through introspection and self-reflection.[29] In the treatment of obesity, both work together to connect an individual to their internal cues and help them become more connected to the environment around them, which can affect their mood, dietary intake, and motivation for exercise and other activities.[30] Using mindfulness and self-awareness, a clinician may work with a patient to educate on the importance of enjoying food and the experience of eating if the patient is accustomed to ignoring the ways their environment can affect how and what they eat.[30] Individuals who struggle with their weight may also have poor self-awareness of their unhealthy eating habits and the inability to distinguish between physical and emotional hunger. Through the clinician-guided practice of mindfulness and self-awareness, the patient will learn behavioral strategies to increase their self-awareness as it relates to their diet, eating, and behaviors related to lifestyle changes.[30]

SLEEP AND STRESS MANAGEMENT

The connection between weight management and sleep quality is often not discussed with patients who struggle with weight despite the awareness that diseases like sleep apnea are prevalent in those with obesity and cardiovascular disease.[31,32] Education on developing healthier sleep habits has a positive relationship with sleep quality; subsequently, having good quality sleep is essential in managing weight and treating obesity because quality sleep affects hormones that contribute to better mood throughout the day and less overall fatigue.[33,34] It is also essential that people who struggle with weight loss learn to manage stress by using coping strategies that do not rely on food for comfort or reward. Everyone experiences stress, but there are factors about living with obesity that uniquely increase stress levels for those living with the condition. For example, rumination about body image, weight stigma within healthcare providers, intrusive thoughts about societal perceptions of weight, the discussion and negative portrayal of weight and obesity in the mainstream and social media, and rumination about shopping for clothes, romantic relationships, and everyday furniture not being made for people living in larger bodies can all be sources of stress for a patient who struggles with weight loss.[35,41] Working with a behavioral health clinician can help patients improve how they manage stress by teaching them healthy coping mechanisms and techniques to help them respond better to those stress cues that affect their

mood and self-perception while they work through their treatment plan.[36-38]

IMPLEMENTATION

Integrating a behavioral health practitioner into an obesity practice is essential in the interprofessional approach to treating obesity. A behavior health practitioner may be a licensed psychologist, licensed clinical social worker, mental health counselor or licensed professional counselor, and some may also benefit from a licensed chemical dependency counselor or addiction counseling in general.[43] Within their scope, the behavioral health practitioner can meet with the patient for therapy sessions to help overcome barriers to success. These conversations with a therapist involve the use of various therapy techniques to explore the psychological reasons why a person has not been successful in their attempt to lose weight.[39] A trained therapist can also help a patient explore their family of origin—which speaks to the way an individual was raised to think about food, meals, eating, and the relationship of those topics to oneself.[40] That exploration can lead patients to understand why they engage in the behaviors that may not always be helpful to their weight-loss goals. Therapy can also help patients explore any trauma or events that may be impacting their progress and treatment; it can help a patient be aware of many triggers that cause relapse and loss of motivation.[40] Body image and self-perception are also topics a therapist can help someone navigate to improve both body image and its relationship with self-perception; working through those barriers can help someone embrace the body they have while working to achieve their desired health goals.[41,42] The use of therapy in the treatment of obesity is one of the most important treatment components in successful management of this disease and other chronic illnesses. Integrating therapy into a patient's treatment plan can help a person make more progress and sustain their weight loss when compared to others who do not engage with this treatment.[36,39]

CONCLUSION

The inclusion of lifestyle interventions is central to the successful treatment of obesity and CVD. Implementation of nutrition, exercise, and behavioral health interventions provide the foundation for sustained weight management and CVD health. The interprofessional approach to lifestyle factors works well in conjunction with any medical and surgical treatments. There is no one way to use these interventions; therefore, a patient-centered, custom-tailored approach is best to achieve results. By using a well-rounded approach, clinicians can help overcome barriers to success in the treatment of those who have obesity, cardiovascular disease, and other chronic illnesses.

KEY POINTS

- Effective nutrition interventions for obesity include the Mediterranean diet, DASH diet, and incorporation of more plant-based food options.
- Exercise with emphasis on aerobic and resistance training may help manage weight and cardiovascular disease.
- Patients seeking long-term weight loss would benefit from therapy sessions to explore many aspects of behavioral and mental health that contribute to obesity.

COMPETING INTERESTS

The authors have no competing interests to declare.

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