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Obesity management in primary care: A joint clinical perspective and expert review from the Obesity Medicine Association (OMA) and the American College of Osteopathic Family Physicians (ACOFP) - 2025

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ABSTRACT

Background: This collaboration from the Obesity Medicine Association (OMA) and the American College of Osteopathic Family Physicians (ACOFP) examines obesity management from a primary care perspective.
Methods: This joint perspective is based upon scientific evidence, clinical experience of the authors, and peer review by the OMA and ACOFP leadership. The goal is to identify and answer sentinel questions about obesity management from a primary care perspective, utilizing evidence-based publications, and guided by expert clinical experience.
Results: Obesity is a disease that contributes to both biomechanical complications and the most common cardiometabolic abnormalities encountered in primary care. Barriers that impede optimal care of patients with obesity in primary care include failure to recognize obesity as a disease, lack of accurate diagnosis, insufficient access to obesity treatment resources, inadequate training, insufficient time, lack of adequate reimbursement and the adverse impact of bias, stigma, and discrimination.
Conclusions: Family physicians are often the first line of treatment in the healthcare setting. This affords early intervention opportunities to prevent and/or treat overweight and/or obesity. Patient care is enhanced when primary care clinicians recognize the risks and benefits of anti-obesity medications and bariatric procedures, as well as long-term follow-up. Practical tools regarding the 4 pillars of nutrition therapy, physical activity, behavior modification, and medical interventions (anti-obesity medications and bariatric surgery) may assist primary care clinicians improve the health and lives of patients living with obesity.

1. Who is the Obesity Medicine Association (OMA)?

The Obesity Medicine Association (OMA) represents a United States based medical society having the greatest number of physicians, nurse practitioners, physician associates, and other clinical experts (i.e., over 5000 members at time of print) engaged in the management of patients with the disease of obesity (https://obesitymedicine.org/).

2. Who is the American College of Osteopathic Family Physicians (ACOFP)?

The American College of Osteopathic Family Physicians (ACOFP) is a professional medical association that represents more than 26,000 practicing osteopathic family physicians, residents, students, and other allied health professionals throughout the US (https://www.acofp.org/).

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3. Is obesity a disease?

According to the OMA, obesity is defined as a: "Serious, chronic, progressive, relapsing, and treatable multi-factorial, neurobehavioral disease, wherein an increase in adiposity promotes adipose tissue dysfunction and abnormal fat mass physical forces, resulting in adverse metabolic, biomechanical, and psychosocial health consequences" [2] (See Table 1). Some of the key attributes that define obesity as a disease include identifiable signs and symptoms of increased adiposity-related metabolic or mass effect dysfunction that reflect disease process impacting adipose tissue and target organs. Like many other diseases, the multifactorial origins of obesity may be genetic, developmental, behavioral, or due to infections or exposure to toxic substances. The morbidity and mortality can be mitigated, or perhaps caused to go into remission in some cases, through lifestyle changes, medical therapy, or interventional procedures. From a primary care perspective, the endocrinopathies, immunopathies, and biomechanical dysfunction of increased adiposity and obesity are among the most clinically relevant modifiable cause of type 2 diabetes mellitus (T2DM) [3], hypertension [4], dyslipidemia [5] cardiovascular disease [6], thrombosis [7], and/or cancer [8].

Table 1
Obesity as a disease checklist. Obesity meets the criteria as a disease. (Adapted from Ref. [1]).

Disease criteria	Obesity
Diagnosed by:	
• Signs and symptoms of illness, sickness, or ailment	✓
• Adverse anatomic changes to an organ or system of the body	✓
• Dysfunction of an organ or system of the body	✓
Contributes to:	
• Increased morbidity	✓
• Increased mortality	✓
Caused by:	
• Genetic or development errors	✓
• Inflammation or infection	✓
• Poisons, toxicity, or adverse side effect of pharmaceuticals	✓
• Nutritional abnormalities	✓
• Unfavorable environmental or behavioral factors	✓
Treated by:	
• Medical nutrition therapy	✓
• Routine physical activity	✓
• Behavior modification	✓
• Medication	✓
• Surgery and endoscopic procedures	✓
• Patient education and training	✓
Managed by:	
• Primary care clinicians	✓
• Specialists	✓
• Multidisciplinary team	✓

4. Why is it important for family physicians and other primary care clinicians to effectively manage patients with obesity?

Obesity is a chronic disease that affects over 40 % of adults in the United States), nearly 2.5 billion adults worldwide, with cardiovascular disease (CVD) being a leading cause of death among patients with obesity [9,10]. In the US, the total direct and indirect annual costs of obesity is estimated to be $400 billion [11]. Genetics, community, behavior, and environmental factors (e.g., cumulative stress) may influence obesity and its complications, with disparities often reported based upon race/ethnicity, sex, gender and sexual identity, and socioeconomic status [12–17].

Based upon clinic visit coding, it is estimated that approximately 8 % of primary care visits involve the management of overweight and obesity [18]. However, this is likely a gross underestimation due to challenges with coding data in the clinic setting. Often, clinicians are not reimbursed for services related to obesity management alone. This may contribute to the variance of the diagnosis of obesity based on coding versus chart review [19]. Estimates suggest that as few as 30.6 % of patients with BMI $\geq$30 kg/m^2 had acknowledgement of the patient's body composition in the patient visit records [20], with as few as 5.6 % of patient records including obesity in the problem list despite meeting objective criteria of obesity [21]. Proper coding alone for obesity may have prognostic implications, in that documentation of an obesity diagnosis may be independently predictive of at least 5 % weight reduction among patients with obesity; thus, acknowledging obesity as a diagnosis may be an important step in managing obesity as a disease [22].

Another challenge in assessing the true impact of increased adiposity on patient management in primary care is that, as previously noted, obesity contributes to the onset and worsening of the most common metabolic diseases encountered in primary care, such as T2DM [3], hypertension [4], dyslipidemia [5], and thrombosis [7], as well as other common complications of obesity such as sleep apnea [23], mental stress [24], cardiovascular disease [25], cancer [8,26], and increased mortality and disability-adjusted life-years [25]. In short, irrespective of what may be reflected by coding alone, many primary care clinicians manage patients with the disease of obesity and its complications as the most common cause of clinician office visits; thus, increased adiposity might best be considered a diagnostic and management priority for many medical encounters [27].

It is estimated that a 2 point increase in body mass index (BMI) may reduce average life expectancy by one year, suggesting that a BMI of 30–35 kg/m^2 may decrease life expectancy by 2–4 years and a BMI of 40–45 kg/m^2 may decrease life expectancy by 8–10 years [28–30]. Conversely, among patients with obesity, reducing body weight can often reduce morbidity and mortality. Specifically in patients with pre-obesity/overweight or obesity and T2DM, the most consistent aspect of healthful dietary intake that contributes to T2DM remission is the degree that a healthful nutrition intervention results in weight reduction, irrespective of the evidenced-base diet type [3]. Similarly, the most consistent factor resulting in T2DM remission with a structured weight management program or bariatric surgery is weight reduction [3].

In a broader sense, among individuals with obesity, 5 % weight reduction may improve risk factors for cardiovascular disease, with

weight reduction of ≥10–15 % contributing most consistently to improvement in sleep apnea, reduction in the new onset T2DM [31], reduction in metabolic dysfunction-associated steatohepatitis (MASH), reduction in cardiovascular disease risk, and reduction in overall mortality [1,32], as well as preventing the progression of T2DM [31]. Unfortunately, some studies estimate that only 40 % of adults with obesity or overweight receive counseling for weight reduction during encounters with clinicians [33].

5. How is obesity diagnosed?

Common BMI criteria for overweight and obesity include [2]:

- BMI ≥25 kg/m^2 = overweight or pre-obesity
- BMI ≥30 kg/m^2 = obesity
- Central obesity = waist circumference ≥40 inches (102 cm) for males and ≥35 inches (88 cm) for females

These diagnostic criteria may not apply to all patients. For example, among Asian individuals [16], criteria may include:

- BMI ≥23–24.9 kg/m^2 = overweight or pre-obesity
- BMI ≥25 kg/m^2 = obesity
- Central obesity = waist circumference ≥35.4 inches (90 cm) for Asian males; ≥31.5 inches (80 cm) for Asian females

BMI and even waist circumference can be misleading especially when considering individuals from different sex, racial, and ethnic subgroups [13–16,35]. Percent body fat is a more accurate measure of adiposity (See Table 2). Even then, percent body fat does not reflect body fat distribution. While percent body fat may be diagnostic, it may not be the best prognostic measure of adiposity-related disease. At least with regard to cardiovascular disease risk, it is the accumulation of visceral fat [34] that best reflects adipose tissue dysfunction (adiposopathy) and best correlates with future cardiovascular disease risk [14,36].

6. What barriers exist that impair obesity management (See Fig. 1)?

6.1. Patient factors

Patient experiences with weight stigma and bias negatively affect patient care. Perceived negative judgement based upon patient body weight from primary care providers diminishes patient trust and can adversely impact quality of care. [37]. Patient mental stress associated with weight stigma can trigger counterproductive coping strategies producing unwanted outcomes such as increased caloric consumption [38,39]. People with increased body weight may avoid care or switch clinicians due to stigmatizing experiences and poor communication with treating clinicians [40]. This, in turn, may result in decreased patient satisfaction, less adherence to treatment plans, and maladaptive lifestyle responses which may contribute to worse health outcomes [40]. Weight stigma and bias among health care clinicians is best replaced by advocacy to seek and achieve positive change in policy, environment, and societal attitudes, as well as to "enhance public awareness, promote prevention, advance clinical research, develop safe and effective evidenced-based therapeutic interventions, and facilitate patient access to comprehensive and compassionate treatment of the complex disease of obesity" [41]. Practical examples of individual advocacy is the use of people first language, avoidance of staff jokes and phrases offensive to patients with obesity, and availability of obesity-appropriate office environment and equipment [41].

People with obesity (PwO) may not recognize that they have obesity. In the Awareness, Care and Treatment in Obesity Management (ACTION) study, only 50 % of PwO saw themselves as having obesity [42]. While 60 % acknowledged that obesity was a disease, only 54 % were concerned that it might affect their health. Additionally, PwO might not expect their primary care provider to address their body weight as the same study showed that 82 % of patients felt they were the ones completely responsible for their weight loss reduction [42].

Psychosocial factors can impact the management of obesity. Lifestyle changes command significant patient time, effort, and expense. Long work hours and night shift work are associated with obesity. A National Health and Nutrition Examination Survey (NHANES) analysis found that working >40 h per week increased the risk of obesity by 40 % [43]. Obesity is more prevalent in low-income populations, potentially due to limited access to healthful foods, limited education regarding healthful foods, physical inactivity, mental stress, and other environmental factors (https://www.cdc.gov/obesity/data-and-statistics/adult-obesity-prevalence-maps.html; https://www.cdc.gov/nchs/products/databriefs/db50.htm). [44]. Furthermore, some evidence supports that while low socioeconomic factors may contribute to obesity, obesity may also contribute to lower income (i.e., reverse causality) [45]. Mental health factors like depression, anxiety, or stress may also negatively impact a patient's body weight [24].

6.2. Clinician factors

Several clinician factors may present barriers to optimal treatment of obesity. Some clinicians may have bias and negative stereotypes regarding patients who have obesity. (See Fig. 2). Other clinicians may not have the educational background and/or training [46] to appreciate the breadth of obesity as a disease and how the adiposopathic consequences of obesity contribute to endocrinopathies and immunopathies, often leading to the most common reasons for primary care clinician encounters [47]. Primary care clinicians may also lack sufficient resources for optimal obesity management, including inadequate time for medical visits of patients with obesity who often have multiple medical complications. Finally, primary care clinicians may not be adequately reimbursed for obesity management [48], disincentivizing physicians from spending the time needed for the optimal treatment of obesity.

7. How can a nurse or medical assistant contribute to optimal obesity management?

The OMA has published a series of tables with itemized listings relevant to medical practice obesity management that include: practice summary, business startup, equipment, services, practice priorities and philosophies, policies and procedures, standard operating procedures, patient materials, certifications and ongoing training, as well as discussion of obesity-relevant aspects of tele/video health encounters [2]. Additionally, tasks that may be undertaken by a nurse or medical assistant prior to the clinician encounter include:

- Assessment for accurate and thorough completion of patient intake forms for medical practices using electronic health records, which

Table 2
Obesity Medicine Association percent body fat diagnostic criteria, as assessed by dual X-ray absorptiometry (DXA). (Table copied from Ref. [34]).

Obesity Medicine Association Classifications of Percent Body Fat in Adults as Assessed by DXA		
	Women	Men
Essential fat	<15 %	<10 %
Athlete	15–19 %	10–14 %
Fitness	20–24 %	15–19 %
Acceptable	25–29 %	20–24 %
Pre-obesity	30–34 %	25–29 %
Obesity	≥35 %	≥30 %

Fig. 1. Patient barriers to optimal obesity management. Care of individuals with obesity can be impaired due to lack of access to nutritional and physical activity education and monitoring, behavior modification counseling, anti-obesity pharmacotherapy, and/or bariatric surgery/procedures. Bias, stigma, and discrimination can also contribute to inadequate care of individuals living with obesity.

may be especially important in anticipation of possible future pre-authorization approval for anti-obesity medications [49].

- Administration of obesity-related questionnaires for underlying psychiatric disease or eating disorders [50].
- Accurate assessment of baseline health metrics (e.g., height, weight, waist circumference, blood pressure, and heart rate) [2].
- Unbiased preliminary discussion of body weight goals, lifestyle modification (e.g., dietary guidance, physical activity monitoring), behavior modification, as well as education on the benefits and risks of anti-obesity medications and bariatric surgery.
- Utilization of motivational interviewing techniques which may improve the effectiveness of nursing guidance to patients with obesity [50].
- Provide follow-up contacts to support an obesity treatment plan.

8. Among adults with obesity, what are the specific benefits of weight reduction on patients with "sick fat disease" or adiposopathy (e.g., cardiometabolic disease, cardiovascular disease, and cancer) and "fat mass disease" (e.g., sleep apnea, osteoarthritis)?

8.1. *Sick fat disease (Adiposopathy)*

Adipose tissue is the organ that stores the greatest amount of body energy. However, excessive positive caloric balance may lead to adipocyte hypertrophy and dysfunction, as well as adipose tissue expansion and dysfunction. This adiposopathy) contributes to the development of insulin resistance, elevated blood glucose [3], elevated blood pressure [4], elevated atherogenic blood lipids [5], as well as cardiovascular disease [53] and cancer [8]. Moderate weight loss of 5–10 % improves metabolic disease. Compared to changes in BMI, the reduction of cardiometabolic risk factors and cardiometabolic risk may better correlate to reductions in visceral fat [36,54]. Fig. 3 shows the categories of obesity complications that include "sick fat disease"

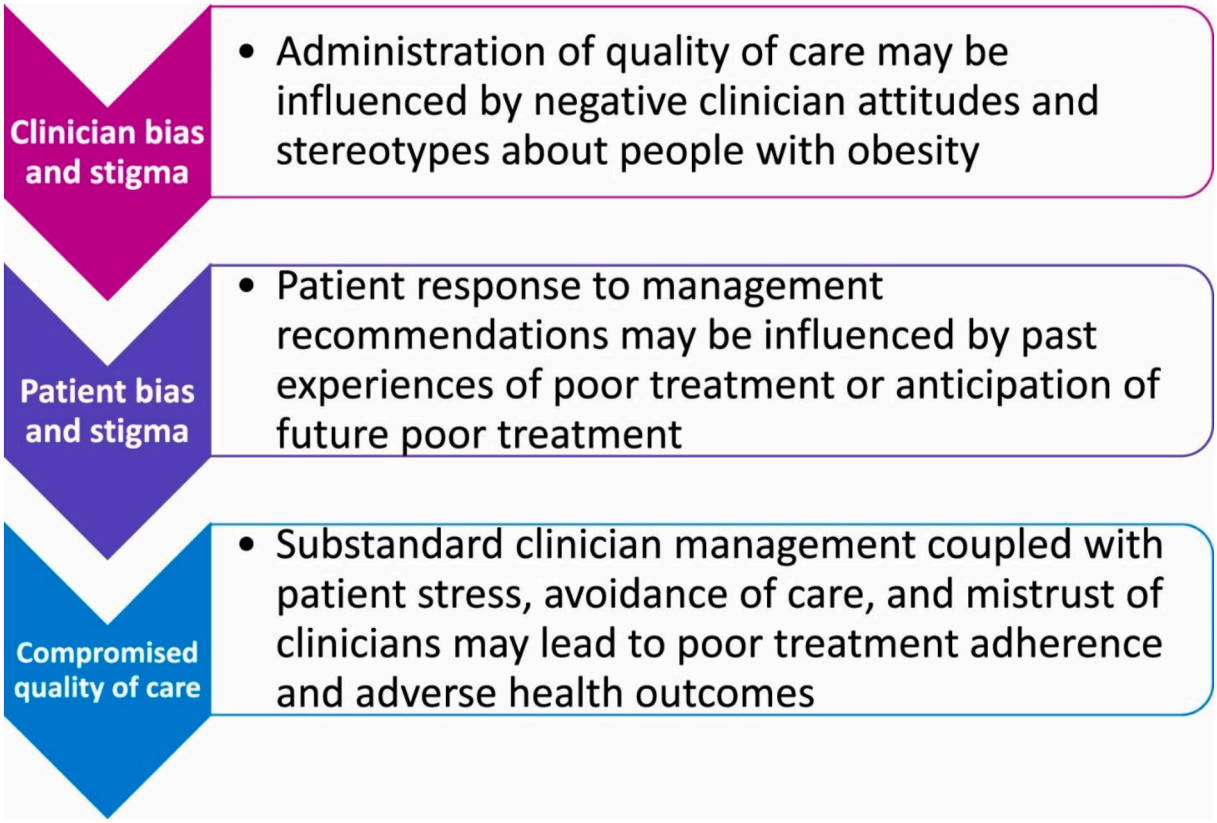

Fig. 2. Adverse health consequences of clinician weight bias and stigma. Many healthcare clinicians hold negative attitudes and stereotypes about people with obesity. Such attitudes affect person-perceptions, judgment, interpersonal behavior, decision-making, and may adversely impact the quality-of-care clinicians provide and patients receive. Past experiences of poor treatment or anticipation of poor treatment may contribute to patient stress, avoidance of care, mistrust of clinicians, poor adherence, and adverse health outcomes among patients with obesity (Copied from Ref. [41]).

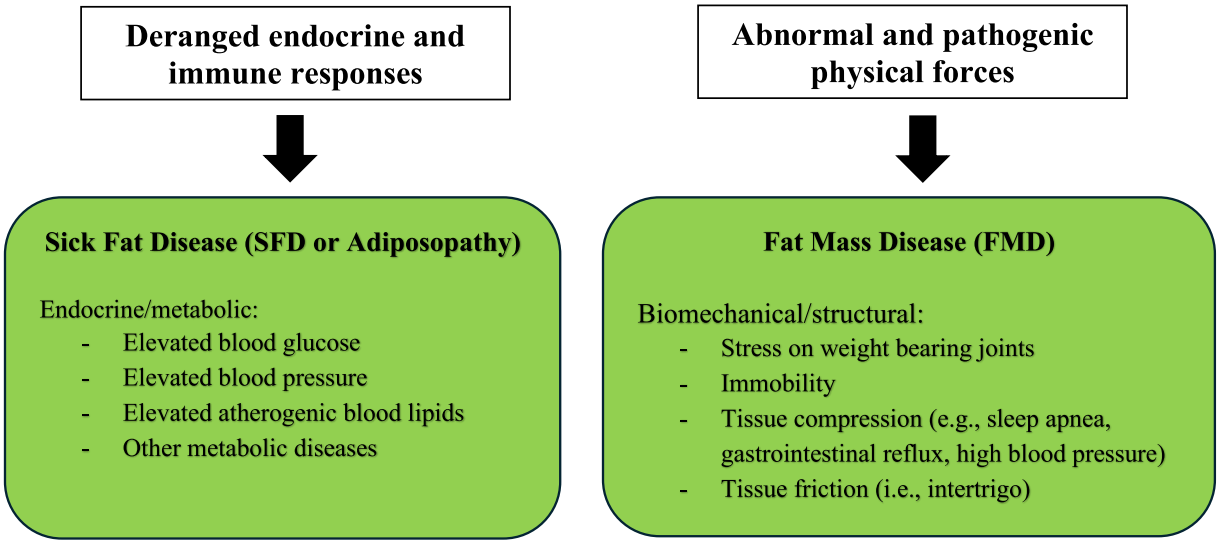

Fig. 3. Metabolic and Fat Mass Complications of Obesity. Obesity can have both metabolic and mechanical adverse consequences, including endocrine/metabolic consequences and pathogenic issues related to biomechanics. (Adapted from Ref. [2]). For example, an important adiposopathic consequence of obesity is metabolic dysfunction-associated steatohepatitis (MASH) [51].

(adiposopathy) and "fat mass disease." Table 3 demonstrates the predicted health benefits of weight reduction in patients with obesity.

8.2. Fat mass disease

Excess weight can increase mechanical forces on joints and compresses tissues affecting respiration, renal perfusion, and skin integrity. The excessive load on knee joints due to obesity may induce stress and malalignment that contributes to osteoarthritis; weight reduction has the potential to reduce knee pain among patients with obesity [55]. Increased visceral adipose tissue and perirenal fat may compress the kidneys, increasing renal tubular absorption of sodium,

Table 3
Estimated degree of mean weight reduction associated with clinically meaningful improvement in illustrative health outcomes [32]. (Copied from [52].

Degree of weight reduction associated with improvement in health condition	Medical conditions
≥2.5 % weight reduction	• Improvement in glucose metabolism • Reduction in triglyceride blood levels • Improvement in polycystic ovary syndrome and infertility
≥5.0 % weight reduction	• Improvement in Impact on Weight on Quality-of-Life score • Improvement in depression • Improvement in mobility • Improvement in knee functionality, as well as improvement in walking speed, distance, and pain among patients with knee osteoarthritis • Reduction in hepatic steatosis • Improvement in urinary incontinence • Improvement in sexual function • Increase in high density lipoprotein cholesterol levels • Improvement in health care costs
≥10 % weight reduction	• Improvement in sleep apnea • Improvement in non-alcoholic steatohepatitis[a]
>15 % weight reduction	• Potential reduction in cardiovascular and overall mortality

[a] The more current term for non-alcoholic steatohepatitis (NASH) is metabolic dysfunction-associated steatohepatitis (MASH).

and thus increasing blood pressure [56]. Adverse integumentary effects of obesity include mechanical friction, infections, and hypertrophic changes [57].

9. Should primary care physicians have separate weight-related visits to help manage obesity?

Among patients with obesity, some data suggests that only about 25 % of patients are offered a weight-management treatment plan [20], possibly because the clinician prioritizes the management of other concomitant diseases. This suggests the potential benefit of dedicated weight-related clinician visits. For patients with obesity, structured weight management in primary care may improve weight reduction [58]. Incorporating group visits and virtual visits to address weight management can be an effective tool to treat obesity in a primary care setting (https://info.primarycare.hms.harvard.edu/perspectives/articles/integrating-weight-management-in-primary-care).

10. What are the effects of physician counseling on lifestyle changes on weight reduction?

While individual patient responses vary, data suggests that overall, primary care clinicians can be successful in assisting patients achieve and maintain weight reduction (i.e., ~5 % weight reduction) through intensive counseling regarding lifestyle modifications on a scheduled timeframe [59]. Greater weight reduction usually requires anti-obesity medications [52,60] and/or bariatric surgery [61].

11. What are the benefits of providing nutritional therapy in patients with obesity?

The objective of nutritional intervention for patients with obesity often depends on the concomitant treatment plan. That said, common principles that apply, irrespective of the concomitant obesity treatment plan include:

- Incorporating dietitians in primary or outpatient care, which improves coordination of care and compliance with attending sessions with the dietitian in the future [62].
- Assessing potential eating behaviors as well as limiting the intake of energy dense foods and portion control
- Increasing the consumption of healthful foods such as fruits and vegetables [63].

Overall, modifying dietary intake is an integral component of obesity management. A healthful dietary routine can improve metabolic health and reduce the risk of inflammation and noncommunicable diseases [62].

The emphasis of dietary recommendations may differ when nutritional intervention is intended to be the primary mode or main driver of weight reduction among patients with overweight or obesity. In this case, the dietary intake must achieve a sufficient amount of negative caloric balance to promote clinically meaningful weight reduction [1, 64]. However, among patients treated with highly effective anti-obesity medications or bariatric surgery, the emphasis of nutrition intervention and physical activity may shift from achieving further weight reduction to maintaining overall health and supporting long-term outcomes. For example, in patients treated with highly effective anti-obesity medications, the emphasis may shift to mitigating the muscle mass loss and macro/micronutrient deficiencies (i.e., protein) commonly associated with substantial weight reduction [65]. This may be especially important in patients with obesity at risk for sarcopenia with weight reduction [66]. Another priority among patients treated with glucagon-like peptide-1 receptor agonists (GLP-1 RA) is adequate hydration to avoid increases in creatine and blood urea nitrogen. The potential for GLP-1 RA related dehydration is increased with nausea, vomiting, decreased food intake (many foods contain water), as well as potential decreased fluid intake with GLP-1 RA [67], with some reports suggesting this is at least partially due to decreased thirst [68].

12. Is it feasible for family physicians to provide nutritional counseling during a patient encounter?

Primary care clinicians face practical challenges when engaging in nutritional intervention for patients with obesity, which include [69]:

- Inadequate training in nutritional therapy
- Insufficient time to implement and monitor nutritional therapy
- Lack of interest in providing nutritional therapy
- Lack of reimbursement of nutritional therapy

That said, many primary care clinicians can incorporate nutritional and physical activity recommendations through a commitment to education, and by focusing on essential principles. Examples of simple ways for primary care clinicians to assess and make recommendations regarding nutritional and physical activity include:

- Recommend the patient keep a dietary diary, recording everything they eat and drink for a week. Schedule a follow-up weight-specific visit to review the diary and discuss any dietary concerns.
- Convey basic nutritional principles to the patient with obesity who may also be at risk for cardiovascular disease and cancer, that include [70]:
  - o Prioritize
    - Vegetables, fruits, legumes, nuts, whole grains, seeds, and fish
    - Foods rich in monounsaturated and polyunsaturated fats such as fish, nuts, and non-tropical vegetable oils
    - Soluble fiber
  - o Limit
    - Saturated fat
    - Excessive sodium

- Cholesterol in patients at high risk for CVD with a known increase in serum cholesterol
- Ultra-processed carbohydrates
- Sugar-sweetened beverages
- Alcoholic beverages
- Avoid all *trans* fats

- Provide more granular nutritional advice. For example, the two meal plans having the most evidence in reduction of cardiovascular risk and other health benefits are the Mediterranean Diet and the "Dietary Approaches to Stop Hypertension" (DASH) diets [64].
- Refer to a registered dietician for more in-depth nutritional counseling.

13. What type of impact and how much impact do behavioral modifications have on patients with obesity?

Intensive behavioral therapy has varying definitions. Irrespective of the specific behavior therapy plan, the overall intent is to provide nutritional and physical activity guidance at increased effort, frequency, and duration compared to conventional nutritional and physical activity guidance. Intensive behavior therapy may result in 8 %–10 % mean weight reduction compared to the patient's initial weight [71], with evidence supporting a reduction in the risk of cardiovascular disease and T2DM [31], as well as less weight regain after initial weight reduction among those with obesity [72]. Patients with obesity who have higher adherence rates to visits and behavior changes (in reference to their weight management) are more likely to experience greater weight reduction after bariatric surgery [73].

14. Is it feasible for family physicians to counsel patients on behavioral modification during an encounter?

Primary care clinicians face practical challenges when engaging in nutritional intervention for patients with obesity, which include [74]:

- Lack of adequate training in behavioral therapy
- Lack of adequate time to provide behavioral therapy
- Lack of interest in providing behavioral therapy to patients with obesity
- Lack of reimbursement for behavioral therapy

That said, most primary care clinicians do have a reasonable opportunity to implement rudimentary approaches, such as [50,75,76]:

- Include eating disorder questionnaires in the intake forms in electronic health records
- Utilize basic motivational interviewing techniques
- Apply basic cognitive behavioral therapy and/or acceptance-based therapy techniques
- Employ SMART goals (**S**pecific, **M**easurable, **A**chievable, **R**elevant, and **T**ime-related)
- Refer to a behavioral therapist

15. What are the benefits of physical activity in patients with obesity?

Fig. 4 describes the OMA goals for physical activity, which are similar to the physical activity goals of other medical societies. The major difference is the explicit inclusion of over 5000 steps per day [64]. That is because for many, walking is the most common form of routine physical activity, with less than 5000 steps per day considered sedentary. A greater number of steps per day (i.e., ≥10,000 steps per day) is associated with greater weight reduction [78] among patients with obesity.

It is estimated that the average number of steps per day for US adults is less than 4000 steps per day [64]. While a higher number of steps per day helps achieve improved health outcomes, even minimal to modest physical activity is more healthful than no physical activity. A meta-analysis suggests that above 4000 steps per day is the threshold for detectable reduction in all-cause mortality and only slightly over 2000 steps per day is the threshold for a detectable reduction in cardiovascular mortality [79]. Given that patients with obesity often have physical inactivity and/or physical or other limitations that make achieving 10,000 steps per day a challenge, the OMA chose an initial recommendation of 5000 steps per day as a reasonable balance between evidenced-based health benefits, and achievability. Furthermore, this is only an initial recommendation, with hopes that following effective and sustained obesity management, the number of steps per day can be increased.

For those able and willing to increase their physical activity, combining aerobic training alone and/or resistance training during a weight-reduction nutritional plan may modestly enhance fat weight reduction [80]. Equally important, physical activity or moderate-intensity aerobic exercise (≥250 min/week) after weight reduction allows for greater success in weight reduction maintenance [80]. Beyond the modest improvement in weight reduction, (and/or weight maintenance following weight loss), exercise training programs

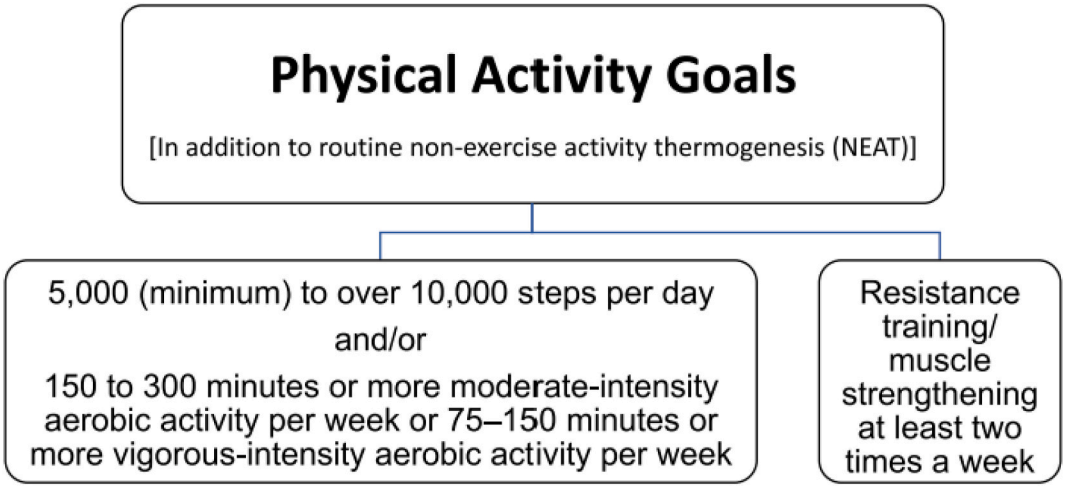

Fig. 4. Obesity Medicine Association (OMA) Physical Activity Goals. OMA physical activity goals include steps per day, specified exercise intensities and durations, and recommended resistance training sessions per week. The OMA physical activity goals specifically include steps to achieve daily, dynamic physical activity goals, with even greater aerobic activity providing additional health benefits. (Copied from [77]).

will also improve insulin sensitivity, hypertension, and intrahepatic fat in adults with obesity, with or without accompanying T2DM [80].

It is often noted that, in the treatment of obesity, the primary benefit of routine physical activity is maintaining weight reduction rather than substantially contributing to initial reduction in weight. Additionally, Table 4 highlights other health benefits of routine physical activity that extend beyond maintenance of body weight. Furthermore, routine physical activity incorporating resistance exercise is an important intervention that may limit the loss of lean body mass during weight reduction, thus helping to mitigate sarcopenia [66].

16. Is it feasible for family physicians to counsel patients on physical activity in the clinical setting?

Primary care clinicians face practical challenges when recommending physical activity for patients with obesity, which include [81]:

- Lack of adequate training in physical activity recommendations
- Lack of adequate time to provide physical activity recommendations
- Lack of interest in providing physical activity recommendations
- Lack of reimbursement for physical activity recommendations

That said, most primary care clinicians do have a reasonable opportunity to implement rudimentary approaches to physical activity advice, such as.

- Write an "exercise prescription", such as FITTE [46,77].
  - o Frequency
  - o Intensity
  - o Time spent
  - o Type of activity
  - o Enjoyment
- Use a patient-centered approach to recommend a specific number of steps per day
- Monitor the number of steps per day, in hopes to escalate when appropriate
- Provide alternative physical activity recommendations for patients with mobility limitations due to their physical conditions; these recommendations may include using a hand bike for patients with lower extremity amputations
- Refer to physical therapy or exercise physiologist

Table 4
Beyond its favorable effects on body weight and body composition, routine physical activity has multiple health benefits applicable to the patient with obesity (Copied from Ref. [1]).

Body weight and composition:	**Metabolic benefits:**
• Facilitates weight reduction • Helps maintain weight reduction • May increase muscle mass • May reduce percent body fat	• Improve insulin sensitivity • Reduce hyperglycemia • Improve blood lipids
Cardiovascular benefits:	**Cancer benefits:** [5]
• Decrease sympathetic tone • Decrease blood pressure • Reduce heart rate • Reduce risk for cardiac dysrhythmias • Improve autonomic balance • Enhance fibrolysis • Enhance coronary dilation capacity • Facilitate myocardial cellular regeneration • Increase myocardial oxygen utilization • Improve endothelial function • Reduce myocardial and plaque inflammation	• Reduce risk of cancer onset • Reduce risk of cancer recurrence • Inhibits cancer cell proliferation • Increase cancer cell apoptosis • Reduce inflammation • Enhance effectiveness of cancer treatment • Counteract cancer and cancer treatment complications
Sleep benefits:	**Neuromusculoskeletal benefits**:
• Reduce time to sleep • Reduce wake time during nighttime • Reduce daytime sleepiness • Possible reduction in sleep medications	• Improve muscle strength • Improve bond strength • Improve balance and coordination • Reduce risk of dementia • Reduce depression • Reduced anxiety & improved mood

17. What are the benefits for primary care clinicians to prescribe anti-obesity medications compared to immediate referral to an obesity medicine specialist?

Obesity Medicine Specialists are available to assist in the management of patients with obesity [46]. Obesity medicine specialists represent less than 1 % of the physician workforce in the United States (https://www.abom.org/stats-data-2/). Given this limitation and given the vast number of patients with overweight and obesity, it is the clinical reality that most patients with obesity will need to be managed by primary care clinicians. Additionally, when managing health risk factors, the greatest lifetime benefit occurs with early management compared to implementing treatment in the late stages of a disease [82]. Studies support that patients who maintain an ongoing relationships with primary care providers reduce their cardiovascular risk and lower all-cause mortality [83–85].

Different weight management models are available that may help improve health outcomes for patients with obesity [58]. Fig. 5 suggests an approach where, in the absence of acute illness, the treatment paradigm should focus on addressing the "cause" of the complications of obesity (i.e., complication such as elevated glucose levels in patients with prediabetes or T2DM), which in most cases, is the result of the adiposopathic endocrinopathies and immunopathies of obesity.

Anti-obesity medications are one of the 4 pillars of obesity management [52,86] (See Table 5 and Fig. 6). Phentermine is a sympathomimetic approved in 1959 for short-term use in the treatment of obesity. This short-term indication reflects prior limited understanding of obesity as a chronic disease and is due to the lack of longer-term data regarding potential health benefits and risks. Nonetheless, given its low cost, the manner in which phentermine is utilized (including duration of treatment) is variable among clinicians [87]. Electronic health record reviews suggest that the use of phentermine beyond the 12-week FDA recommendation is safe and effective [88]. However, some US states restrict its long-term use and prescribers should be knowledgeable of their state's restrictions. The average weight reduction with phentermine depends on dose, duration of treatment, and accompanying behavior modification, but is approximately 7 % [89].

An extended-release version of phentermine plus topiramate is approved for long-term use with an average weight loss of 10 % [89]. Bupropion plus naltrexone extended release is also approved for long-term use with an average weight loss of 5–7 % [90,91].

Advances in the incretin-based class of anti-obesity medications has substantially affected the treatment landscape for obesity. Both semaglutide and liraglutide are glucagon like peptide – 1 receptor agonists (GLP-1 RA), which mimic the glucagon-like peptide-1 (GLP-1) hormone that is released in the gastrointestinal tract in response to eating. GLP-1 RA act on satiety centers in the hypothalamus, slow gastric emptying, and stimulate glucose mediated insulin response. Semaglutide and liraglutide are approved/indicated at lower doses to treat T2DM and approved/indicated at higher doses to treat obesity.

Liraglutide 3.0 mg per day injection was approved as an anti-obesity medication in 2014 and achieves a weight reduction of ≥5 % [52]. As reported in a double-blind clinical trial of nearly 2000 adults with obesity from 2021, once-weekly 2.4 mg semaglutide injection achieved an average weight reduction of 15 % of their body weight over 68 weeks, compared to a 2 % weight reduction in the placebo group [92]. This was followed by the Semaglutide and Cardiovascular Outcomes in Obesity without Diabetes trial (SELECT trial), which demonstrated that in

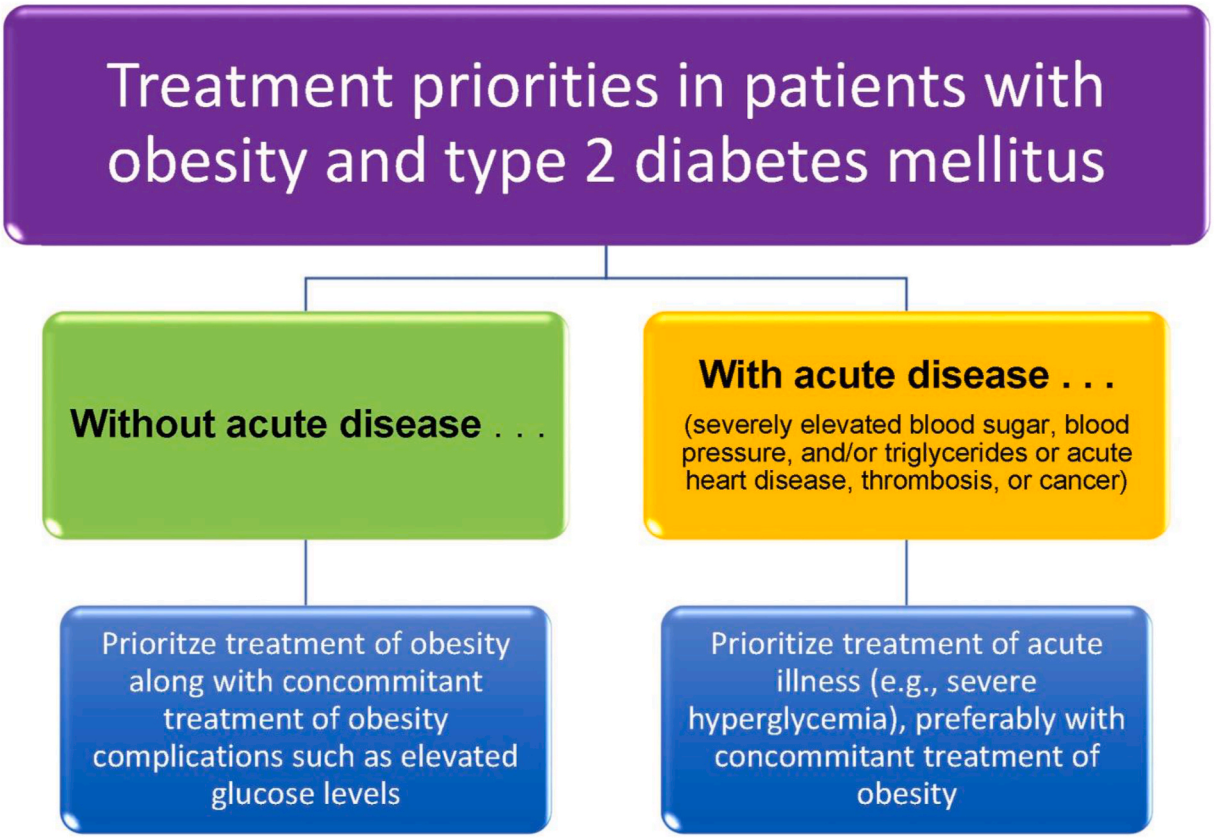

Fig. 5. "Treat obesity first" prioritization for patients with obesity and type 2 diabetes mellitus (T2DM) without acute disease. Treatment of obesity is the priority for most patients without acute illness, especially if the therapies chosen for treatment of obesity are also expected to improve the complications of obesity. Conversely, patients with marked increases in glucose and/or blood pressure, severe dyslipidemia (e.g., severe hypertriglyceridemia), acute thrombosis, cardiovascular disease (CVD), or cancer should have these acute metabolic abnormalities urgently assessed, managed, and treated – preferably with concomitant interventions that may also improve obesity (Copied from Ref. [3]).

patients with preexisting cardiovascular disease and with overweight or obesity but without T2DM, semaglutide 2.4 mg weekly subcutaneous injection was superior to placebo in reducing the incidence of death from cardiovascular causes, nonfatal myocardial infarction, or nonfatal stroke at a mean follow-up of 39.8 months – with an overall 20 % relative risk reduction in cardiovascular endpoints [93]. Semaglutide has the following indicated uses (https://www.novo-pi.com/wegovy.pdf):

- To reduce the risk of major adverse cardiovascular events (cardiovascular death, non-fatal myocardial infarction, or non-fatal stroke) in adults with established cardiovascular disease and either obesity or overweight
- To reduce excess body weight and maintain weight reduction long term in:
  - o Adults and pediatric patients aged 12 years and older with obesity
  - o Adults with overweight in the presence of at least one weight-related comorbid condition

Tirzepatide is also an FDA approved anti-obesity medication that is both a GLP-1 RA and a glucose-dependent insulinotropic polypeptide (GIP) receptor agonist. Tirzepatide may reduce body weight approximately 20 % at 72 weeks on a maximum dose of 15 mg injection weekly [52,94]. In 2024, two phase 3, double-blind, randomized, controlled trials were reported involving adults with moderate-to-severe obstructive sleep apnea and obesity who were not receiving treatment with positive airway pressure (PAP) at baseline. Tirzepatide not only reduced body weight, but also reduced the apnea–hypopnea index, hypoxic burden, improved sleep-related patient-reported outcomes, and reduced highly sensitive C-reactive protein and systolic blood pressure [95]. Tirzepatide has the following indicated uses (https://pi.lilly.com/us/zepbound-uspi.pdf):

- To reduce excess body weight and maintain weight reduction long term in adults with obesity or adults with overweight in the presence of at least one weight-related comorbid condition.
- To treat moderate to severe obstructive sleep apnea (OSA) in adults with obesity

18. What challenges do primary care clinicians encounter regarding use of anti-obesity medications?

Anti-obesity medications (AOM) are effective as part of a comprehensive plan to treat obesity. However, medication cost, limited insurance coverage, supply shortages, and side effects often complicate their use. Beyond generic AOMs and less expensive AOMs (which are generally less effective), the higher cost of AOMs often prohibits out-of-pocket payment. Compounded versions of the incretin therapies are commonly available but may pose safety concerns regarding quality and purity [96,97]. AOMs, including semaglutide and tirzepatide, are intended to be taken long-term, as weight regain often occurs after ceasing the medication [98,99]. For patients experiencing excessive weight reduction, additional diagnostic procedures may be indicated to evaluate for other potential causes of weight reduction, as well as to inform on potential adjustment in AOM dose if weight reduction continues after weight goal is achieved [60].

Patients with higher BMIs may avoid seeking health care due to anxiety around being weighed or being told to lose weight [100].

Table 5
Anti-obesity medications indicated for long-term use. Anti-obesity medications should be avoided with pregnancy, during lactation, or if there is a known hypersensitivity to any of the components. Orlistat is rarely used in clinical practice and was omitted from this table. For a summary of orlistat, see Ref. [52].

Medication	Phentermine/Topiramate ER 3.75/23 → 15/92 mg	Bupropion/Naltrexone 90/8 mg 1 qD→2BID	Liraglutide 0.6 mg→3.0 mg	Semaglutide 0.25 mg→2.4 mg	Tirzepatide 2.5 mg→15 mg
Dosing Route	Daily Oral Scheduled IV Controlled Agent	Twice daily Oral	Daily Injectable	Weekly Injectable	Weekly Injectable
Minimum Age	12 years	18 years	12 years	12 years	18 years
Contra-indications	Glaucoma Hyperthyroidism Taking or within 14 days of stopping monoamine oxidase inhibitors	Uncontrolled hypertension, seizure disorders, anorexia nervosa or bulimia, abrupt discontinuation of alcohol, benzodiazepines, barbiturates, and antiepileptic drugs, opioid use, during or within 14 days of taking monoamine oxidase inhibitors	Personal or family history of medullary thyroid carcinoma (MTC) or Multiple Endocrine Neoplasia (MEN) syndrome type 2	Personal or family history of MTC or in patients with MEN 2	Personal or family history of medullary thyroid carcinoma or in patients with Multiple Endocrine Neoplasia syndrome type 2
Side Effects	Glaucoma, change in mood, cognitive impairment, metabolic acidosis, decrease in renal function, paraesthesia, dizziness, dysgeusia, insomnia, constipation, and dry mouth	Nausea, constipation, headache, vomiting, dizziness, insomnia, dry mouth and diarrhea	Nausea, diarrhea, constipation, vomiting, injection site reactions, headache, hypoglycemia, dyspepsia, fatigue, dizziness, abdominal pain, increased lipase, upper abdominal pain, pyrexia, and gastroenteritis	Nausea, diarrhea, vomiting, constipation, abdominal pain, headache, fatigue, dyspepsia, dizziness, abdominal distension, eructation, hypoglycemia in patients with type 2 diabetes, flatulence, gastroenteritis, gastroesophageal reflux disease, and nasopharyngitis	Nausea, diarrhea, vomiting, constipation, abdominal pain, dyspepsia, injection site reactions, fatigue, hypersensitivity reactions, eructation, hair loss, gastroesophageal reflux disease
Reported weight loss	10 %	7 %	7–8 %	15 %	20 %

BID - twice a day.
ER - extended-release.
https://qsymia.com/patient/include/media/pdf/prescribing-information.pdf (accessed 2024).
https://www.curraxpharma.com/PI/Contrave-label-current.pdf/(accessed 2024).
https://www.novo-pi.com/saxenda.pdf (accessed 2024).
https://www.novo-pi.com/wegovy.pdf (accessed 2024).
https://pi.lilly.com/us/zepbound-uspi.pdf (accessed 2024).

Osteopathic family medicine physicians can address these barriers. The tenets of osteopathic medicine make osteopathic family physicians an effective bridge to overcome these barriers by developing personalized obesity care for patients. Effective obesity management requires comprehensive management practices that include counseling patients about the importance of lifestyle modifications as a complement to pharmacotherapy [86]. General recommendations regarding AOM's and primary care include:

- Anti-obesity medication should be prescribed as an adjunct to healthful nutrition, physical activity, and behavioral modification.
- Staff training is often required to navigate the prior authorizations process from insurances that do cover anti-obesity medications.

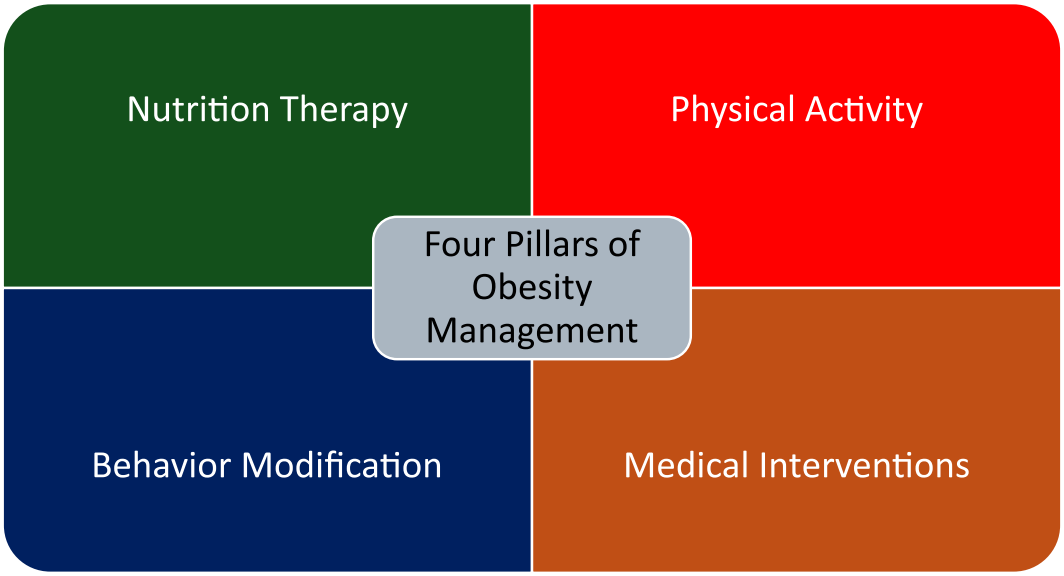

Fig. 6. Four Pillars of Obesity Management. Medical Interventions include anti-obesity medications, and bariatric procedures.

- Common side effects such as nausea, vomiting, diarrhea, constipation, and gastroesophageal reflux can often be managed by slowing dose titration, short-term use of antiemetic medications for symptom relief, and potential dose de-escalation or "drug holiday" when applicable situations arise.

19. How should family physicians decide which patients to send for bariatric surgery consultation?

Primary care clinicians often play an essential role in the initial discussion and referral for bariatric surgery [102]. Patient referrals for bariatric surgery involves shared decision-making based on medical indications and patient goals. The indications commonly approved by health insurance for adults include BMI $\geq$40 kg/m^2, or BMI $\geq$35 kg/m^2 with weight-related co-morbidities, with lower thresholds for Asian populations. Indications for adolescents include BMI >120 % of the 95th percentile and major co-morbidity, or a BMI >140 % of the 95th percentile. Applicable health insurance websites at the time of this writing include:

- United Healthcare: https://www.uhcprovider.com/content/dam/provider/docs/public/policies/comm-medical-drug/bariatric-surgery.pdf (Accessed 12/14/24)
- Aetna: https://www.aetna.com/cpb/medical/data/100_199/0157.html (Accessed 12/14/24)
- Cigna: https://static.cigna.com/assets/chcp/pdf/coveragePolicies/medical/mm_0051_coveragepositioncriteria_bariatric_surgery.pdf (Accessed 12/14/24)

Bariatric surgery in adolescents in their teenage years is generally effective with sustained weight reduction a decade after their procedures [103]. In 2022, the American Society for Metabolic and Bariatric Surgery (ASMBS) and the International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) recommended bariatric surgery for BMI $\geq$35 kg/m^2 regardless of co-morbidities and for those with BMI $\geq$30 kg/m^2 and T2DM or other weight related co-morbidities that have not responded to non-surgical methods [104]. For Asian populations the ASMBS/IFSO recommends bariatric surgery for a BMI $\geq$27.5 kg/m^2 [104].

Once the primary care physician has determined a patient is best referred for bariatric surgery, they should collaborate with the bariatric surgery team to understand and facilitate the pre-surgical plan. Common presurgical evaluations include a nutritional consultation, upper endoscopy, cardiac evaluations, sleep study, psychiatric evaluation, and laboratory testing including screening for common vitamin deficiencies [61,101,105,106].

20. How effective is bariatric surgery for improving cardiovascular outcomes?

Bariatric surgery is effective in improving obesity-related metabolic, cardiovascular, and cancer outcomes [61,107–109]. Comparison of diabetes outcomes in patients treated with bariatric surgery versus medical/lifestyle reported a 37.5 % remission rate in bariatric surgery patients compared to 2 % with medication/lifestyle. Additionally, greater reductions are reported for HbA1c and fasting glucose in the surgery group [61,110]. A 2021 population-based cohort study of patients with known ischemic heart disease or heart failure examined the incidence of MACE (Major Adverse Cardiovascular Events) including all-cause mortality, myocardial infarction, cerebrovascular events, and heart failure, after bariatric surgery. Compared to matched controls, the surgical group showed a 42 % reduction in MACE with a 65 % reduction in cardiovascular mortality [107]. Several studies have identified a decrease in the risk of hormone-related cancers such as breast, endometrial, and prostate cancer, while the effects on colon cancer are less clear [61].

21. What is the role of the family physician after bariatric surgery?

Equally important is the role of primary care clinicians after patients undergo bariatric surgery. Longitudinally, it is critical that the post bariatric surgery patient undergo monitoring for macro and micronutrient deficiencies, long-term surgical complications, psychiatric conditions, and prevention of weight regain. Multiple studies have demonstrated that long-term follow up with the surgical team reduces drastically to 30 % in two years and less than 10 % in 10 years [111]. In cases where this follow up monitoring is not adequately being done elsewhere, it is important that the primary care clinician have a working knowledge of nutritional deficiencies that may occur after bariatric surgery, and how to treat such nutritional deficiencies [61,112]. (See Tables 6 and 7).

After bariatric surgery, it is important that nutritional and vitamin deficiencies be monitored. Although studies have shown mixed statistical results on specific vitamin deficiency seen after bariatric surgery, clinical guidelines recommend vitamin and mineral supplementation (as noted in Table 7). Periodic laboratory evaluation, including vitamin B12, folate, and iron should be monitored to prevent these vitamin deficiencies before and after surgery. Bone loss as well as changes in sex hormones can also occur within 24 months after bariatric surgery [113]. Bone mineral density testing is recommended two years after surgery [114]. Also, patients with obesity and infertility before bariatric surgery may experience improved fertility with weight reduction [115]. This should prompt discussions on appropriate contraception both before and after surgery. After bariatric surgery, the multispecialty team should continue to focus on healthful nutrition and regular physical activity to optimize weight reduction maintenance, minimize nutritional deficiencies, and preserve lean body mass. Psychologically, patients undergoing bariatric surgery may benefit from support groups and individual therapy as they adjust to their new lifestyle after surgery.

While it is often recommended that patients have long-term follow-up by bariatric surgeons after surgery, some patients may discontinue their regular clinic and laboratory follow-up. In a 10-year follow-up study of patients receiving bariatric surgery, only 40 % of patients had sufficient follow-up data at 10 years [116]. Monitoring for nutritional complications of bariatric surgery and use of nutritional supplements is a life-long process. Family physicians should identify patients with a history of bariatric surgery and ensure that those patients are taking the appropriate bariatric nutritional supplements and remain up-to-date with follow-up testing. Testing for nutritional deficiencies is typically done at 3, 6, 9 and 12 months after surgery and annually thereafter [114].

22. How should family physicians code for obesity?

Updated International Classification of Disease (ICD) codes for obesity in adult and pediatric patients became effective October 1, 2024. Applicable references include:

1. https://www.cdc.gov/obesity/media/pdfs/2024/12/adult-partner-promotion-materials-icd-10-codes-508.pdf (Accessed January 2, 2025)
2. https://www.cdc.gov/obesity/media/pdfs/2024/12/child-partner-promotion-materials-icd-10-codes-508.pdf (Accessed January 2, 2025)
3. https://obesitymedicine.org/blog/new-icd-10-codes-for-obesity-treatment-advancements-in-accurate-diagnosis-and-care/?form=MG0AV3 (Accessed January 14, 2025)
4. https://www.cdc.gov/growthcharts/extended-bmi.htm(Accessed January 9, 2025)

The current codes are based on BMI classification of obesity, distinguishing between class 1, class 2, and class 3 obesity (Table 8),

providing more precise clinical information than the previous classifications. Recognizing obesity as a complex, chronic disease, the updated codes improve the quality of data on the disease of obesity in relation to health consequences and disease burden in adults and children. The previous ICD-10 codes used stigmatizing language with explicit language and outdated perspectives implying that obesity is solely due to excess calories. The current ICD-10 codes remove the stigmatizing and biased language that was used in the previous codes and shift the focus to categorizing obesity according to the current scientific classifications. The updated codes replace the older ICD-10 codes E66.01, E66.09, E66.8, and E66.0. Utilization of older codes may result in claim rejection.

The updated adult E66.XXX codes should be used in conjunction with the Z-codes for BMI (See Table 9). The Z-codes for BMI's ranging from 20.0 to 39.9 are determined by combining the Z-code, Z68, with the specific BMI value. When the BMI is below 20 or above 39.9 the Z-code reflects a range of BMI's. For example, if a patient had a BMI of 36.7 kg/m^2, the appropriate codes would be E66.812 for class 2 obesity and Z68.36 reflecting a BMI of 36.

It is the judgement of the authors that the E66 code should reflect the patient's initial or highest BMI, and that this code should remain with the patient, even if the patient experiences subsequent weight reduction that might otherwise reduce the BMI to a lower classification. The rationale for this approach is to reflect that the patient will forever have a past history of the disease of obesity, as well as recognize the patient is at high risk for weight regain. This approach also helps mitigate the unreasonable notion that, if a patient achieves successful weight reduction with an anti-obesity medication, then the successful effective anti-obesity medication should be discontinued. To suggest that effective treatment for obesity should be discontinued once goals are achieved represents a failure to recognize obesity as a disease, in the same way that clinicians readily accept diabetes mellitus, hypertension, and dyslipidemia as diseases. In these analogous cases, it would be unusual for a clinician to recommend that once successful treatment of diabetes mellitus, hypertension, or dyslipidemia is achieved, then treatment of these metabolic diseases should be discontinued.

That said, as weight loss declines, then the Z-code should change to reflect the current BMI. This approach is commonly used for other chronic health conditions. For example, if a patient is being treated for hypertension, the diagnosis is maintained even if the blood pressure is normal with treatment.

Table 6
Recommended baseline laboratory assessment by metabolic bariatric surgery type (Copied from Ref. [101]).

Nutrient	Preferred test	Baseline prior to SG, RYGB	Baseline prior to SADI-S, BPD/DS
Vitamin A (retinol)	Retinol serum		X
Vitamin Bl (thiamin)	Whole blood thiamin	X	X
Vitamin B9 (folate)	Red blood cell folate	X	X
Vitamin B12 (cyanocobalamin)	B12 serum, methylmalonic acid (MMA) serum (provides early sign of B12 deficiency)	X	X
Vitamin D (D2, (ergocalciferol) or D3, (cholecalciferol))	25-OH Vit D	X	X
Vitamin E (A-Tocopherol)	Vit E serum		X
Vitamin K	Vit K serum		X
Calcium (citrate)	Calcium, ionized, serum	X	X
Copper	Copper, serum		X
Iron	Iron and iron binding capacity	X	X
Zinc	Zinc, serum		X

SG: sleeve gastrectomy; RYGB: roux-en-Y gastric bypass; BPD-DS: biliopancreatic diversion with duodenal switch; SADI-S: single anastomosis duodenal-ileostomy with sleeve gastrectomy; OH: hydroxy.

Table 7
Minimum recommended micronutrient intake for metabolic bariatric surgery procedures (Copied from Ref. [101]).

Nutrient	Recommended supplementation SG or RYGB	Recommended supplementation BPD-DS, or SADI-S
Vitamin Bl (thiamin)	At least 12 mg oral daily	At least 12 mg oral daily
Vitamin B9 (folate, folic acid)	400 mcg oral daily (800 mcg oral daily for child-bearing women)	400 mcg oral daily (800 mcg oral daily for child-bearing women)
Vitamin Bl2 (cobalamin; cyanocobalamin synthetic form)	350 mcg oral daily	500 mcg oral daily
Vitamin A (retinol)	5000 IU (1500 mcg)/oral daily	10,000 IU (3000 mcg)/oral daily
Vitamin D (D3, cholecalciferol)	3000 IU (75 mcg)/oral daily	3000 IU (75 mcg)/oral daily
Vitamin E (alpha-tocopherol)	15 mg oral daily	15 mg oral daily
Vitamin K (phylloquinone)	90 mcg oral daily	300 mcg oral daily
Calcium (citrate)	1200 mg oral daily	1800 mg oral daily
Copper	2 mg oral daily	2 mg oral daily
Iron	45 mg oral daily	45 mg oral daily
Zinc'	16–22 mg oral daily	16–22 mg oral daily
Vitamin B2 (riboflavin)	200 % DV, (2.6 mg)	200 % DV, (2.6 mg)
Vitamin B3 (niacin)	20 mg daily (125 % DV)	200 % DV, (F: 28 mg; M: 32 mg)
Vitamin B5 (pantothenic acid)	200 % DV, (10 mg)	200 % DV, (10 mg)
Vitamin B6 (pyridoxine)	4 mg daily	4 mg daily
Vitamin B7 (biotin)	200 *% DV, (*60 mcg)	200 % DV, (60 mcg)
Vitamin C	120 mg daily	180 mg daily

RYGB: roux-en-Y gastric bypass; SG: sleeve gastrectomy, BPD-DS: biliopancreatic diversion with duodenal switch, SADI-S: single anastomosis duodeno-ileostomy with sleeve gastrectomy; DV: daily value; mg: milligrams; mcg: micrograms; IU: international units: F: female: M: male.

The ICD-10 code update also includes current codes for obesity in pediatric patients (See Table 10). The E66 codes identify obesity class according to age- and gender-specific BMI in relation to pediatric patients in the 95th percentile based on BMI-for-age growth charts [117]. For pediatric patients, there is a separate set of Z-codes corresponding to each of the three classes of obesity. As with the adult changes, the current obesity codes for pediatric patients provide greater clinical detail with respect to the child's obesity classification.

Some key steps that family physicians can take to implement the current codes include:

1. Utilize the current obesity ICD-10 codes for all relevant encounters.
2. Update electronic health record by removing the old codes and replacing them with the current ICD-10 codes for obesity plus associated descriptions
3. Educate clinical and billing staff on the current ICD-10 obesity codes and how to use them
4. Communicate with patients utilizing clinically relevant terms avoiding bias language that stigmatizes the patient with obesity

23. Conclusion

Obesity is a chronic, relapsing, and treatable disease. Obesity and its complications are the most common cause of non-traumatic office visits in primary care. The treatment of obesity can improve cardiometabolic risk factors and other metabolic complications (e.g., MASH), reduce the risk of cardiovascular disease, cancer, and potentially reduce all-cause mortality. Family physicians are often the first line of treatment and

Table 8
Adult obesity codes and body mass index (BMI) categories. E-codes are part of the International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) which classifies obesity based on severity. Adult Z-codes are also part of the ICD-10-CM system. E-codes are intended to reflect external causes and Z-codes are intended to reflect factors that may influence health. In the case of obesity, both E-codes and Z-codes are reflected by BMI categories.

Obesity Classification	Updated E-Codes	Adult Z-Code	Adult BMI Categories
Class 1 Obesity	E66.811	z68.30–34	30–34.9
Class 2 Obesity	E66.812	z68.35–39	35–39.9
Class 3 Obesity	E66.813	Z68.41–45	≥40

are well positioned to provide obesity care by either implementing a treatment plan or referring the patient to qualified health professionals for nutritional therapy, physical activity, behavioral modification, pharmacotherapy, or bariatric procedures. The advent of newer, highly effective anti-obesity medications provides obesity treatment options for family physicians, but medical therapy must be combined with the appropriate lifestyle changes to optimize favorable obesity treatment outcomes.

Takeaway messages regarding primary care management of obesity:

- Obesity is a disease that, beyond its fat mass complications, is a major contributor to the most common cardiometabolic abnormalities encountered in primary care (e.g., high blood glucose, high blood pressure, high atherogenic lipids, and cardiovascular disease.)
- Family physicians are often the first line of treatment in the healthcare setting, affording the opportunity early intervention to prevent and/or treat overweight and/or obesity.
- Barriers that impair optimal care of patient with obesity in primary care include failure to recognize obesity as a disease, lack of accurate diagnosis, insufficient access to obesity treatment resources, and the adverse impact of bias, stigma, and discrimination.
- Beyond the importance of the primary care clinician, the clinician office staff can often play an important role in optimizing the management of patients with obesity.
- Among patients living with obesity, body fat reduction can improve cardiovascular disease risk factors, reduce the risk of cardiovascular disease, and improve quality of life.
- Optimal management of patients with obesity includes the 4 pillars of nutrition therapy, physical activity, behavior modification, and medical interventions (anti-obesity medications and bariatric procedures).
- Despite the challenges of inadequate training, insufficient time, and lack of reimbursement, practical tools and approaches are available regarding these 4 pillars, which may better allow primary care clinicians to improve the health and lives of patients with obesity.
- Towards the goal of optimal care of patients with obesity, primary care clinicians should have a working knowledge of the risks and benefits of anti-obesity medications – especially those with proven health outcomes benefits.
- Primary care clinicians should also have a working knowledge of the risks and benefits of bariatric procedures, especially regarding long-term clinical and laboratory follow-up.

Table 9
Adult BMI and corresponding Z-code. Z codes are a non-procedural category of International Classification of Diseases-10 (ICD-10) codes that reflect social, economic, and environmental determinants that affect patient health. Z codes are typically accompanied by a corresponding procedure code, such as a Current Procedural Terminology (CPT) office visit code (e.g., 99213, 99214, 99215).

Adult BMI kg/m^2	Adult Z-code
<20	Z68.1
20.0–24.9	Z68.20-Z68.24
25.0–29.9	Z68.25-Z68.29
30.0–34.5	Z68.30-Z68.34
35.0–39.9	Z68.35-Z68.39
40.0–44.9	Z68.41
45.0–49.9	Z68.42
50.0–59.9	Z68.43
60.0–69.9	Z68.44
≥70	Z68.45

Transparency and group composition [118]

The authors reflect a mixed group of experts in obesity science and primary care. NP, HP, SH, and CV are members of both the OMA and ACOFP. BR, and SP are members of the ACOFP. HEB is a member of OMA.

Author contributions

NP was responsible for drafting the topics of the initial draft. All the authors engaged in review and editing. HEB served as medical writer. All authors approved the final draft.

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Dr. Nicholas Pennings has served as a consultant for Abbott, speaker for Novo Nordisk, and an independent contractor with Medifast.

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Table 10
Pediatric E and Z obesity codes and corresponding body mass index (BMI) categories.

Obesity Classification	Updated E-Codes	Pediatric Z-code	Pediatric BMI Categories
Class 1 Obesity	E66.811	Z68.54	95th percentile to <120 % of the 95th percentile.
Class 2 Obesity	E66.812	Z68.55	≥120 % of the 95th percentile to <140 % of the 95th percentile.
Class 3 Obesity	E66.813	Z68.56	≥140 % of the 95th percentile.

Evidence

The content of this manuscript is supported by citations, which are listed in the References section, as well as the practical clinical experiences of the authors.

Ethics review

This submission did not involve experimentation of human test subjects or volunteers. Authors who concomitantly served as journal Editors for Obesity Pillars or Osteopathic Family Physician Journal were not involved in editorial decisions or the peer review process. Journal editorial decisions and peer review management was delegated to non-author society members or non-author journal Editors.

Peer review

This joint expert review underwent peer review according to the policies of the participating organizations (e.g., journal reviewers and societal leadership). Additionally, this manuscript was reviewed by the leadership of both the ACOFP and OMA.

Declaration of artificial intelligence (AI) and AI-assisted technologies in the writing process

AI was used for suggestions regarding topic headings and word phrasing, but not used in the writing of the text nor creation of its figures.

Additional conclusions and recommendations

This joint expert review is intended to be an educational tool that incorporates the current medical science and the clinical experiences of obesity specialists, primary care clinicians, and/or those engaged in obesity management. The intent is to better facilitate and improve the clinical care and management of patients with obesity. This joint expert review should not be interpreted as “rules” and/or directives regarding the medical care of an individual patient. The decision regarding the optimal care of the patient with overweight/pre-obesity and obesity is best reliant upon a patient-centered approach, managed by the clinician tasked with directing an individual treatment plan that is in the best interest of the individual patient.

Updating

This joint expert review may require future updates. The timing of such an update will be determined by the respective societies authoring this document.

Disclaimer and limitations

This joint expert review was developed to assist health care professionals in providing care for patients with pre-obesity and obesity based upon the best available evidence. In areas regarding inconclusive or insufficient scientific evidence, the authors used their professional judgment. This joint expert review is intended to represent the state of obesity medicine at the time of publication. Thus, this joint expert review is not a substitute for maintaining awareness of emerging new science. Finally, decisions by clinicians and healthcare professionals to apply the principles in this joint expert review are best made by considering local resources, individual patient circumstances, patient agreement, and knowledge of federal, state, and local laws and guidance.

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