Screening, Diagnosis, Evaluation, and Staging of Obesity in Adults: Standards of Care in Overweight and Obesity—2026

*American Diabetes Association Professional Practice Committee for Obesity**

https://doi.org/10.2337/doci26-0003

Obesity is a heterogeneous chronic disease in which excess adiposity increases the risk of morbidity and mortality. The Obesity Association, a division of the American Diabetes Association (ADA), developed comprehensive, evidence-based guidelines on screening, diagnosis, evaluation, and staging of overweight and obesity in adults. Monitoring for consistent increases in weight over time may facilitate early intervention to prevent obesity and its complications, and screening for excess adiposity should be performed at least annually using BMI. The recommended diagnostic criteria for overweight and obesity include race- and ethnicity-specific BMI thresholds supplemented with waist circumference–based measures for certain individuals to reduce the risk of underdiagnosis. Health care professionals should perform a comprehensive clinical evaluation, including risk stratification and staging, of all adults diagnosed with overweight or obesity, which will inform the management plan and follow-up care. The ADA's Obesity Association encourages health care professionals to adopt these guidelines for evaluating obesity in adults.

Obesity is a heterogeneous chronic disease in which excess adiposity increases an individual's morbidity and mortality risk. Complex interactions between genetic, neurobiologic, physiologic, behavioral, and environmental factors contribute to the development of obesity (1), which may manifest as central or visceral adiposity, that is, excessive accumulation of metabolically active fat around the abdominal organs. Secondary causes of weight gain may also influence clinical presentation (2). Health care professionals should be aware that obesity is distinct from subcutaneous adipose tissue disorders (e.g., lipedema) (3), although individuals with these disorders may also have obesity. Rare genetic obesity syndromes have been identified (4) and may need to be evaluated as a cause of obesity in select individuals.

In research and clinical practice, obesity has often been identified by BMI, which was initially derived for the study of human growth patterns ("Quetelet index") in 1832 (5). Initial research by Keys et al. (6) compared weight and height ratios with markers of adiposity, including densitometry and skinfold measurements, which identified BMI as the best estimate of body fat. BMI gained prominence owing to its close correlation with excess adiposity and health (6), as epidemiological studies showed a consistent association between elevated BMI and risk for numerous diseases, such as diabetes (7), hypertension (8,9), and cardiovascular disease (10–12). In 1995, the World Health Organization established BMI thresholds for the classification of weight status, including overweight and obesity, citing a U- or J-shaped association with clinical outcomes and mortality (13). However, BMI does not directly evaluate body composition or distribution of body fat. Health care professionals should be aware that BMI is an imperfect measure of excess adiposity, particularly on an individual level, as it may overestimate adiposity in muscular individuals and underestimate adiposity in certain populations (e.g., people with Asian backgrounds, older adults) (14,15). Therefore, other assessments are needed to identify obesity among these groups.

This section establishes standards for screening, diagnosis, evaluation, and staging of obesity in nonpregnant adults (Fig. 3.1). The methodology for the "Standards of

Correspondence: ObesitySOC@diabetes.org

*A complete list of members of the American Diabetes Association Professional Practice Committee for Obesity can be found in the Appendix at the end of the article.

This section has been reviewed and approved by the ADA Board of Directors.

This section has received endorsement from The Obesity Society, Obesity Action Coalition, Obesity Medicine Association, and American Board of Obesity Medicine Foundation.

This article is being simultaneously published in *Diabetes, Obesity, and CardioMetabolic CARE* and *BMJ Open Diabetes Research & Care*.

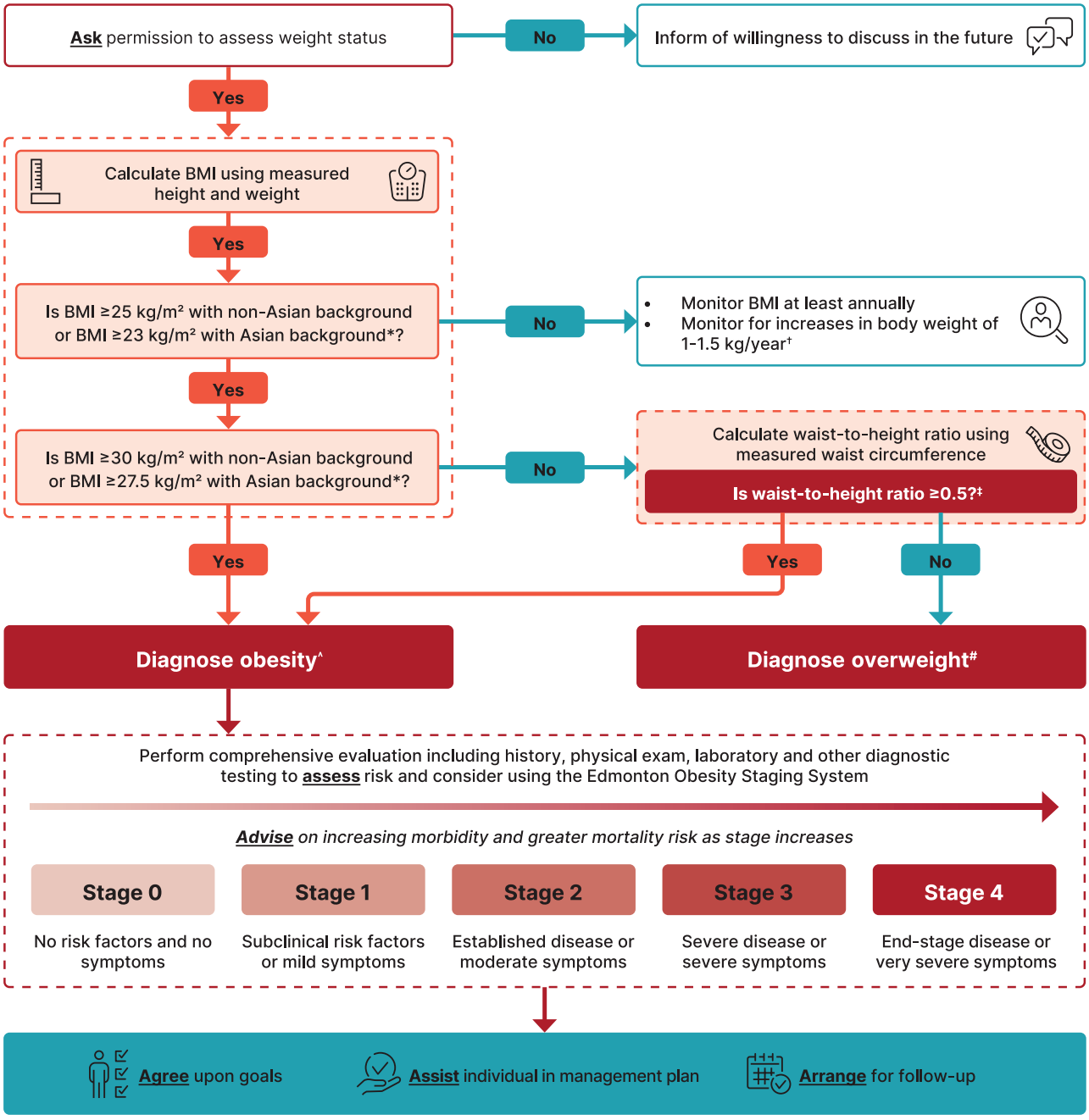

FIGURE 3.1 Evaluation of overweight and obesity in nonpregnant adults. Underlined words highlight the application of the 6As (Ask, Assess, Advise, Agree, Assist, Arrange) counseling framework for the evaluation and management of overweight and obesity. *The BMI thresholds identified for people with an Asian background represent general targets, and health care professionals should be aware that specific values may exist for certain Asian countries that differ from the values listed (40,41,55). †Consistent increases in body weight, regardless of BMI status, have been associated with increased risk of developing obesity and obesity-related diseases and complications. If identified, the health care professional should perform a comprehensive history and physical examination to determine whether secondary causes of weight gain should be considered and consider strategies, as appropriate, to prevent the development of obesity and its related diseases and complications. ‡Health care professionals may use waist circumference as an alternative to waist-to-height ratio in differentiating obesity and overweight. Among adults with a non-Asian background, obesity should be diagnosed if waist circumference is ≥88 cm in women or ≥102 cm in men. Among adults with an Asian background, obesity should be diagnosed if waist circumference is ≥80 cm in women or ≥90 cm in men. If waist circumference is below the appropriate threshold for the individual, then overweight should be diagnosed. ^If physical examination suggests that an individual may have a predominance of muscle mass, the health care professional should measure waist circumference to evaluate for central adiposity and obesity should only be diagnosed in these cases if central adiposity is present. The health care professional may also consider evaluating body composition in these individuals via other methods (e.g., bioelectrical impedance analysis, dual X-ray absorptiometry) to confirm adiposity is ≥35% in women or ≥25% in men. Clinicians should be aware that individuals with a predominance of muscle mass could have increased abdominal girth due to increased abdominal musculature (294), which requires use of one of these other assessment methods. #If physical examination suggests that an individual may have a predominance of muscle mass, the health care professional should evaluate body composition via other methods (e.g., bioelectrical impedance analysis, dual X-ray absorptiometry). Overweight should be diagnosed in these cases only if adiposity is ≥35% in women or ≥25% in men.

Criteria to screen for excess adiposity and diagnose overweight and obesity in nonpregnant adults

Condition	Criteria for people with non-Asian background	Criteria for people with Asian background*
Excess adiposity	BMI ≥25 kg/m^2	BMI ≥23 kg/m^2
Overweight	BMI 25–29.9 kg/m^2 with WHtR <0.5 or BMI 25–29.9 kg/m^2 with WC <88 cm in women; BMI 25–29.9 kg/m^2 with WC <102 cm in men	BMI 23–27.4 kg/m^2 with WHtR <0.5 or BMI 23–27.4 kg/m^2 with WC <80 cm in women; BMI 23–27.4 kg/m^2 with WC <90 cm in men
Obesity	BMI ≥30 kg/m^2 or BMI 25–29.9 kg/m^2 with WHtR ≥0.5 or BMI 25–29.9 kg/m^2 with WC ≥88 cm in women; BMI 25–29.9 kg/m^2 with WC ≥102 cm in men	BMI ≥27.5 kg/m^2 or BMI 23–27.4 kg/m^2 with WHtR ≥0.5 or BMI 23–27.4 kg/m^2 with WC ≥80 cm in women; BMI 23–27.4 kg/m^2 with WC ≥90 cm in men

Elevated WC in women with a non-Asian background is ≥35 inches and in men with a non-Asian background is ≥40 inches. Elevated WC in women with an Asian background is ≥31.5 inches and in men with an Asian background is ≥35.5 inches. WC, waist circumference; WHtR, waist-to-height ratio. *The BMI and WC thresholds identified for people with Asian backgrounds represent general targets, and health care professionals should be aware that specific values may exist for certain Asian countries that differ from the values listed above (40, 41, 55). Asian background includes Asia (e.g., China, Japan, Korea) and the South Asian subcontinent (e.g., India, Pakistan, Bangladesh). Clinicians should be aware of the evidence gap regarding individuals who identify as having mixed race or ethnicity. At this time, clinicians should use the background from which the individual identifies.

Care in Overweight and Obesity" has been described previously (16). In brief, these guidelines are developed by the Professional Practice Committee of the American Diabetes Association (ADA)'s Obesity Association, an interprofessional team of experts. Subcommittees conduct systematic literature reviews to inform updates, guided by a methodologist and librarian. Recommendations are graded based on evidence quality (A, B, C, or expert opinion E), with the strongest evidence derived from large, well-designed randomized controlled trials (RCTs) and meta-analyses of such RCTs (16). While evidence forms the basis, recommendations emphasize person-centered care and pragmatic implementation in clinical settings. Recommendations are deliberated by ADA Professional Practice Committee for Obesity voting members, with an 80% consensus required for approval. External peer reviews and adherence to established guideline development principles ensure credibility and rigor in the approach. The ADA and its subdivision, the Obesity Association, will hold an ongoing public comment period to request feedback on the "Standards of Care in Overweight and Obesity." The ADA Professional Practice Committee for Obesity will review compiled feedback on an ongoing basis to prepare pending content and subsequent updates throughout the year. Readers who wish to comment on the "Standards of Care in Overweight and Obesity" are invited to do so at https://bit.ly/soc-obesity-comments.

Monitoring Weight and Screening for Excess Adiposity

Recommendations

3.1 Monitor for consistent increases in body weight to identify adults at high risk of developing obesity and its related diseases and complications **B**. Body weight increases of more than 1–1.5 kg/year over more than 3 years indicate potential elevated risk **C**.

3.2 Screen for excess adiposity in adults using BMI at least annually **B** (Table 3.1).

Clinical practices and health care professionals should reduce the risk of weight bias and stigmatization when screening for and diagnosing obesity. Recommendations regarding changes to the clinical practice environment, such as making accommodations to provide privacy during anthropometric measurements, are outlined in the article "Weight Stigma and Bias: Standards of Care in Overweight and Obesity—2025" (17). Importantly, it is key for health care professionals to first ask permission to discuss weight with individuals (Fig. 3.1). If individuals decline, respect autonomy by refraining from forcing conversation and reevaluate in 1 year. If individuals accept, then clinicians may proceed with the evaluation. In addition, the application of an evidence-based counseling framework may be helpful in guiding the encounter; the application of the 6As (Ask, Assess, Advise, Agree, Assist, Arrange) (18) during the evaluation of overweight and obesity in adults is incorporated into Fig. 3.1. Health care professionals' use of the 6As has been associated with improved outcomes, including increased self-efficacy, intention to change behavior, and weight reduction among people with obesity (19–21).

Monitoring Weight

Consistent increases in body weight, regardless of BMI status, have been associated with increased risk of developing obesity and obesity-related diseases and complications (22). Numerous prospective cohort studies have reported that weight gain increases the risk of developing diabetes (23,24), hypertension (9), coronary heart disease (11,25), stroke (12), and some cancers (26) over time. Therefore, health care professionals should monitor for consistent increases in nonpregnant body weight to identify individuals at high risk of developing these complications. This screening may be particularly important among young and middle-aged adults, as weight gain during early-to-middle adulthood has been associated with greater health risks (22,27). For example, a longitudinal analysis of data from the National Health and Nutrition Examination Survey (NHANES) found that weight gain during young-to-middle adulthood was associated with higher risk of all-cause mortality (hazard ratio [HR] 1.22, 95% CI 1.11–1.33) and heart disease mortality (HR 1.49, 95% CI 1.21–1.83) compared with individuals

who remained weight stable (27). In addition, more rapid weight gain (>1.7 kg/year) during young adulthood has been associated with greater risk of diabetes, hypertension, and osteoarthritis at middle age (28). It is also notable that, on average, individuals entering young adulthood today weigh 4 kg more and gain weight 1.7 times faster than young adults 20 years ago (29).

While the evidence is clear that weight gain is associated with health risks, the magnitude of weight increase for which health care professionals should be monitoring is less clear, as prospective studies have inconsistently defined weight gain. By extrapolating across multiple studies, a consistent weight gain of 1–1.5 kg/year over more than 3 years may confer increased risk of obesity and its related complications (12,23–25,28). This magnitude of weight increase may therefore be a reasonable indicator to monitor among individuals without obesity. However, future research is needed to evaluate outcomes with this specific threshold. While percent weight change could be another metric to monitor, absolute weight change simplifies implementation for health systems, as this measure can be easily monitored through existing fields in most electronic health record (EHR) systems.

If weight gain is identified, clinicians should perform a comprehensive history and physical examination to determine whether secondary causes of weight gain should be considered, such as hypothyroidism, polycystic ovarian syndrome, and hypercortisolemia. Clinicians should be familiar with the differential diagnosis for weight gain (2). Weight-promoting medications should be identified as described in "Pharmacologic Treatment of Obesity in Adults: Standards of Care in Overweight and Obesity" (30). As the number of weight-promoting medications used increases, individuals' BMI values are more likely to show greater increases over time (31). Strategies for managing weight-promoting medications are outlined in the aforementioned article. In addition, the health care professional may need to consider appropriate intervention strategies to prevent the development of obesity and its related diseases and complications among individuals with weight gain.

Screening for Excess Adiposity

The rationale for disease screening has been outlined by the Wilson-Jungner criteria (32), which may be applied to excess adiposity (obesity) (Table 3.2). Despite advocacy for obesity screening (33–35), no prospective studies or randomized trials have examined the effect of screening for excess adiposity on outcomes. A retrospective evaluation of a national screening program among Japanese adults with central adiposity found that identified individuals who received counseling on healthy lifestyle had small improvements in BMI, blood pressure, and hemoglobin A_{1c} (A1C) (36). Given that individuals identified as having obesity by a health care professional are more likely to be interested in treatment (37,38), increased screening for excess adiposity is important for diagnosis and management.

BMI has been popularized for screening due to its ease of implementation in clinical settings, as measuring weight and height are low-cost assessments that are already routinely integrated into clinical care workflows and EHRs. BMI is calculated using weight in kilograms divided by the square of height in meters (or weight in pounds divided by the square of height in inches and then multiplied by 703), and ideally both weight and height should be measured rather than self-reported (39). Health care professionals should use race- and ethnicity-specific BMI thresholds in screening for excess adiposity (Table 3.1) (40,41), as people with Asian backgrounds have increased visceral adiposity compared with their peers (42). BMI in the overweight range (25–29.9 kg/m^2) corresponds to 20–25% body fat in men and 32–38% in women, which has laid the foundation for the frequently cited definition of excess adiposity of >25% in men and >35% in women (43,44). BMI strives to identify excess adiposity that may impair health, and screening should be done at least annually or opportunistically if the individual infrequently visits the health care setting (e.g., urgent visit). Without screening, many adults could be unaware of their health risks and the potential need to seek treatment (45,46). For example, a cross-sectional study in primary care found that >80% of individuals did not know their BMI or the BMI thresholds for when treatment is generally recommended (45). Lack of recognition has been noted to be particularly common in men, racial and ethnic minorities, and individuals with low socioeconomic status (47). Some racial and ethnic minorities also may not have a conceptual meaning of BMI in their language (48).

As with any assessment, BMI has limitations. BMI does not directly evaluate or assess body composition or body fat distribution—it is an indirect assessment of excess adiposity. Several systematic reviews and meta-analyses have described its sensitivity and specificity as well as performance relative to other anthropometric assessments (49–51). For example, a meta-analysis of 25 studies found that BMI had a pooled sensitivity (true positive rate) for identifying excess adiposity of 50% (95% CI 43–57%) and a pooled specificity (true negative rate) of 90% (95% CI 86–94%) (51). Another systematic review found that BMI was highly correlated with waist circumference (WC) (49), and WC is correlated with central adiposity on abdominal imaging (52). Computed tomography and magnetic resonance imaging can accurately assess body composition and body fat distribution, including distinguishing between subcutaneous and visceral adipose tissue (53). While these imaging modalities may be considered gold standards in evaluating adiposity, their use has been primarily limited to research studies due to practicality and costs. In clinical settings, body composition may be assessed using dual X-ray absorptiometry (DEXA) or bioelectrical impedance (BIA), although these techniques also have limitations (53). Until advancements

TABLE 3.2 Application of the Wilson-Jungner criteria to support screening for excess adiposity (obesity)

Criteria*	Evidence to support obesity screening
The condition should be an important health problem.	• Doubling of obesity prevalence has occurred in >70 countries and continually increased in others between 1980 and 2025 (295) • Consistent association between obesity and all-cause mortality (296,297) • Obesity is a greater contributor to disability-adjusted life-years and death than undernutrition in >200 countries (298) • Higher health care costs are associated with excess body weight across a broad range of ages and BMI levels (299)
There should be a recognizable latent or early symptomatic stage.	• Risks to health may begin in the overweight state (297), which is identifiable using BMI (13) • Overweight (BMI 25–29.9 kg/m^2) corresponds to 20–25% body fat in men and 32–38% in women, which established the frequently cited thresholds of excess adiposity of >25% in men and >35% in women (43,44)
The natural history of the condition, including development from latent to declared disease, should be adequately understood.	• Natural history of obesity and its trajectories over time have been described (300) • Expert consensus around preclinical and clinical disease (15)
There should be a suitable test or examination.	• BMI is closely correlated with excess adiposity and health risk (6) • World Health Organization established BMI thresholds for the classification in 1995 (13)
The test should be acceptable to the population.	• Diagnosis of obesity by a physician has been associated with increased interest in treatment and weight loss attempts (37,38) • Individuals accept being weighed as part of medical care, but some may refuse (301)
There should be accepted treatment for individuals with recognized disease.	• Multiple U.S. clinical practice guidelines have outlined the treatment of obesity since 1998 (33–35,302)
Facilities for diagnosis and treatment should be available.	• Obesity can be diagnosed and treated in primary care (303,304) • Health care professionals with competency in obesity medicine are in every U.S. state, and access is increasing over time (305,306)
There should be an agreed policy on whom to treat.	• Multiple U.S. clinical practice guidelines have outlined the treatment of obesity since 1998 (33–35,302)
The cost of case-finding should be economically balanced in relation to possible expenditure on medical care as a whole.	• Screening for and primary care treatment of obesity may be cost-effective (303,304)

*Adapted from the Wilson-Jungner criteria (32).

in design and access to assessments of body composition and body fat distribution occur, BMI remains a validated screening measure that is easily implemented in clinical settings.

Diagnosing Obesity

Recommendations

3.3a Diagnose obesity in adults with a non-Asian background when excess adiposity is identified via any of the following criteria: BMI ≥30 kg/m^2 **B**; BMI ≥25 kg/m^2 and waist-to-height ratio ≥0.5 **B**; BMI ≥25 kg/m^2 and waist circumference ≥88 cm in women or ≥102 cm in men **B**.

3.3b Diagnose obesity in adults with an Asian background when excess adiposity is identified via any of the following criteria: BMI ≥27.5 kg/m^2 **B**; BMI ≥23 kg/m^2 and waist-to-height ratio ≥0.5 **B**; BMI ≥23 kg/m^2 and waist circumference ≥80 cm in women or ≥90 cm in men **B**.

3.3c Diagnose overweight in adults with a non-Asian background when excess adiposity is present without central adiposity via any of the following criteria: BMI 25–29.9 kg/m^2 and waist-to-height ratio <0.5 **B**; BMI 25–29.9 kg/m^2 and waist circumference <88 cm in women or <102 cm in men **B**.

3.3d Diagnose overweight in adults with an Asian background when excess adiposity is present without central adiposity via any of the following criteria: BMI 23–27.4 kg/m^2 and waist-to-height ratio <0.5 **B**; BMI 23–27.4 kg/m^2 and waist circumference <80 cm in women or <90 cm in men **B**.

While BMI alone is recommended for screening for excess adiposity, the diagnosis of overweight and obesity may require additional anthropometric assessments (Table 3.1). Studies have found that BMI ≥30 kg/m^2 has a high specificity (few false positives) for identifying adiposity of >25% in men and >35% in women but low

sensitivity (44,51). A 2020 meta-analysis reported that the sensitivity and specificity of BMI to detect obesity was 51.4% (95% CI 38.5–64.2%) and 95.4% (95% CI 90.7–97.8%), respectively, for women (16 studies) and 49.6% (95% CI 34.8–64.5%) and 97.3% (95% CI 92.1–99.1%), respectively, for men (12 studies) (50). While health care professionals can have confidence that an individual with BMI ≥30 kg/m^2 has obesity, relying on BMI alone for diagnosis may miss individuals with excess adiposity that increases their risk of morbidity and mortality. Therefore, individuals with BMI <30 kg/m^2 should have additional WC-based assessments (Table 3.1).

Underdiagnosis (false negativity) is a great concern, with potentially 25% of men and 48% of women being misdiagnosed using BMI (54). Health care professionals should be aware that BMI is known to underestimate obesity in certain populations, particularly people from Asian backgrounds and older adults (14,15). Individuals with Asian backgrounds have elevated risk of obesity-related diseases and death at lower BMI values (41,55,56), which may be driven by the accumulation of visceral adipose tissue (42). Therefore, race- and ethnicity-specific BMI thresholds (≥27.5 kg/m^2 for a person with an Asian background) should be used (Table 3.1) to reduce underdiagnosis (40,57). Loss of muscle mass in older adults reduces the accuracy of BMI, which may lead to underdiagnosis of obesity (58). A systematic review concluded that correlations between adiposity and BMI decrease with age; however, BMI still identified elevated risk for cardiovascular disease, some cancers, and impaired mobility in older adults (14).

To reduce underdiagnosis, health care professionals should diagnose obesity for any individual with BMI 25–29.9 kg/m^2 (or BMI 23–27.4 kg/m^2 for a person with an Asian background) who meets race- and ethnicity-specific criteria for elevated waist-to-height ratio (WHtR) or WC, as these individuals have central adiposity that increases their risk of morbidity and mortality (59–63). WHtR is calculated by dividing measured WC (cm) by measured height (cm). A meta-analysis of 10 studies found that WHtR was the best discriminator for diabetes, hypertension, and dyslipidemia risk in both sexes relative to BMI and WC (59). Another systematic review found that WHtR predicts risk of diabetes and cardiovascular disease among older adults as well (64). A 2020 meta-analysis reported that the sensitivity and specificity of WC to detect obesity were 62.4% (95% CI 49.2–73.9%) and 88.1% (95% CI 77.0–94.2%), respectively, for women (8 studies) and 57.0% (95% CI 32.2–79.0%) and 94.8% (95% CI 85.8–98.2%), respectively, for men (6 studies) (50). Another systematic review and meta-analysis of 31 studies found that WHtR and WC had significantly greater discriminatory accuracy for assessing cardiometabolic risk than BMI (65). While WC may be measured in any adult with BMI ≥25 kg/m^2 (or BMI ≥23 kg/m^2 in people with an Asian background), its addition is most critical among adults with BMI 25–29.9 kg/m^2 (or BMI 23–27.4 kg/m^2 for a person from an Asian background). Focusing on WC measurement only in these groups may ease implementation into the clinical workflow as well as avoid health care professionals' discomfort in obtaining the WC measurement (66,67). Clinicians should diagnose overweight when excess adiposity is present without central adiposity (Table 3.1). Health care professionals may also use other body composition assessments (e.g., DEXA, BIA), if available, to confirm excess adiposity and reduce underdiagnosis.

While overdiagnosis of obesity (false positivity) can occur among individuals with high muscle or bone density, it is generally uncommon when using BMI (50,51), particularly among women. For adults in whom elevated BMI may be due to excess muscle mass, health care professionals should confirm excess adiposity via WHtR, WC, or other body composition assessment (e.g., DEXA, BIA) to diagnose obesity. BMI alone in this scenario may misclassify risk for morbidity and mortality (i.e., inaccurately indicates elevated risk). Health care professionals should rely on history and physical examination to determine whether they suspect high muscle or bone density may be present.

It is critical to obtain valid and accurate anthropometric data, including measured weight, height, and WC (when indicated), when diagnosing obesity, as an inaccurate diagnosis may have major effects for individuals and the health care system. Clinical practices need to ensure that staff measure weight and height at least once a year to accurately calculate BMI, as self-reported values may be inaccurate. A systematic review of 62 studies found that self-reported weight was underestimated by adults, and height tended to be overestimated (39). While BMI is a simple pragmatic measure that is routinely used in clinical practice, measuring WC can present challenges in the clinical setting. Studies have found that health care professionals report discomfort in obtaining WC (66,67), as they worry that the measurement might embarrass individuals with obesity. However, individuals with obesity do not necessarily report this concern as long as the procedure was explained to them and its rationale was provided (66).

Figure 3.2 outlines best practices for accurately measuring WC in clinical settings. Ideally, clinicians and appropriate staff should be trained in WC measurement technique, and clinical practices should develop protocols to implement this procedure within their clinical workflows. WC can be measured at different locations; therefore, it is important for practices to follow a measurement protocol to ensure consistency and accuracy for longitudinal assessment. A systematic review of 11 studies concluded that WC measured at all locations strongly correlated with BMI (68), and

Step 1. Prepare the individual

- Use a private room when measuring WC to reduce stigmatization.
- Explain to the person the reason for measuring WC and outline all the steps of the procedure before performing them, particularly the need to expose the abdomen to obtain an accurate reading by measuring on bare skin.
- Obtain the individual's permission to measure their WC.†

Step 2. Identify anatomical landmarks

- Ask the person to stand upright with feet close together and weight evenly distributed.
- Expose the abdomen by having the person gather their shirt above the waist.
- Have the person palpitate their right hip bone (iliac crest); they can then guide the health care professional's hand to locate it. Repeat for the left iliac crest.

Step 3. Position the measuring tape

- Ask the person to hold one end of the tape on their hip, then walk around them so the measuring tape encircles their body at their waist.
- Palpate the right hip again and position the tape in a horizontal plane at the uppermost lateral border of the right iliac crest.
- Palpate the left hip again and position the tape in a horizontal plane at the uppermost lateral border of the left iliac crest.
- Instruct the person to gather their shirt above the waist, cross their arms, and place their hands on opposite shoulders.^
- Check that the tape is parallel to the floor, snug but not compressing the skin, and lies flat against the body.

Step 4. Measure

- Ask the person to inhale then exhale. Record the WC measurement to the nearest 0.1 cm at the end of a normal expiration.

Step 5. Record and interpret

- Document the WC measurement in the medical record.
- Calculate the waist-to-height ratio.

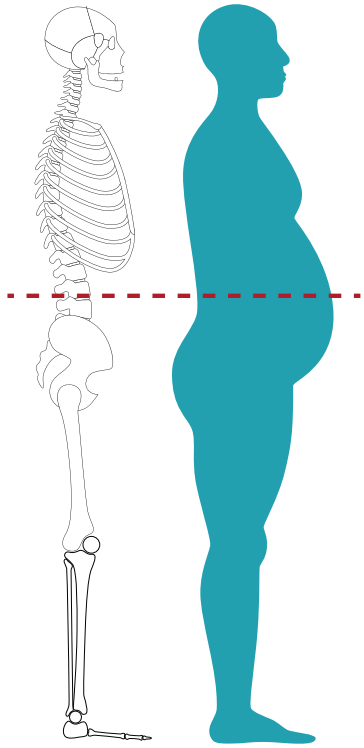

FIGURE 3.2 Best practices for measuring waist circumference (WC) in adults. The steps outlined reflect best practices for waist circumference measurement. Ideally, all clinicians and staff should be trained on how to measure waist circumference, and practices should develop protocols to implement this procedure within their clinical workflows. Clinical practices may need to determine the best protocol for their setting given available resources and time. While waist circumference may be measured in any individual, health care professionals may prioritize measuring waist circumference among individuals where BMI alone is inadequate to determine a diagnosis of obesity. For people with a non-Asian background, waist circumference should be measured if the BMI is between 25 and 29.9 kg/m^2 to distinguish between a diagnosis of overweight and obesity. For people with an Asian background, waist circumference should be measured if the BMI is between 23 and 27.5 kg/m^2 to distinguish between a diagnosis of overweight and obesity. Health care professionals may measure waist circumference to aid risk stratification regardless of BMI. †If possible, avoid measurement immediately after a meal or if abdominal bloating or distention is present. ^It may help to tell them to think of giving themselves a hug. If necessary, lower the pants and underclothing to slightly below the waist.

another review found that the anatomical location used in the WC measurement protocol had no substantial influence on its association with mortality, diabetes, or cardiovascular disease (69). WC is often measured immediately above the iliac crest in clinical trials, and WC measured at the midpoint between the lowest rib and the iliac crest may be used in clinical practice. Of note, WC at the midpoint between the lowest rib and iliac crest may be the most accurate measure of visceral fat and percent body fat in both sexes as well as the most sensitive measure for visceral fat changes over time (68). Ultimately, either WC measurement location may be used, and clinical practices should emphasize consistency in using the WC measurement protocol selected.

Evaluating and Staging Obesity

Recommendations

3.4a After diagnosing overweight or obesity, perform a comprehensive evaluation at the initial visit to obtain a weight history **B**, identify factors contributing to weight gain **C**, and assess overall health status **C**; assess current and previous treatments for obesity, including treatment barriers **C**; evaluate for obesity-related diseases and complications **B**; assess for other concurrent medical or psychological conditions **B**; identify care partners and support systems **A**; and assess social determinants of health and structural barriers to optimal health and health care **B**.

3.4b Using information from the comprehensive evaluation, perform risk stratification and develop a management plan: identify regional distribution of excess adiposity to risk stratify for obesity-related diseases and complications **B**; consider using the Edmonton Obesity Staging System to comprehensively stratify risk and disease prognosis in people diagnosed with obesity **B**; partner with the person with obesity in formulating a management plan, including goals of care **A**; and develop a plan for continuing care **B**.

After diagnosing overweight or obesity, an initial comprehensive evaluation should be performed that includes history and physical examination as well as laboratory and diagnostic testing (Table 3.3). While some components of this history and physical examination will be familiar to most clinicians, other components may be new to many health care professionals given the known education and training gaps related to obesity (70). Therefore, Table 3.4 provides detailed information on these unique history-taking elements related to obesity, including the rationale for obtaining the information, sample questions, tips for real-world implementation, and how the information may affect clinicians' actions or decisions. The history outlined in Table 3.3 aims to provide a holistic view of the individual, assessing various biopsychosocial factors over the life course for their independent, cumulative, and interactive influence on their health (71). This information, along with the individual's perspective, aids in risk assessment and treatment decision-making, including likely treatment outcomes and response (72–74).

While Table 3.3 provides a comprehensive list, health care professionals may need to prioritize components of the clinical evaluation given available resources and time in their clinical practice. Engaging other health care team members can also support comprehensive obesity care (e.g., registered dietitian nutritionists, behavioral health professionals) (75), as can referral to health care professionals with competency in obesity medicine (76,77). In addition, the management plan may benefit from engaging other specialists with expertise relevant to individuals' obesity-related diseases and complications (e.g., endocrinology, cardiology, hepatology). People with obesity have identified the importance of being referred to specialists who treat them with care and respect (78); therefore, clinicians should consider this factor when developing their network of care partners. Finally, care partners may be outside the traditional health care system (e.g., community-based programs). Consider establishing trusted partnerships with local organizations to facilitate referrals, as individuals may find it challenging to identify evidence-based programs on their own as information presented online may be inadequate (79).

Throughout the initial evaluation, health care professionals should be aware of their own potential weight bias, weight bias among clinic staff, and the stigmatization that may occur due to the clinic's physical environment or protocols. The article "Weight Stigma and Bias: Standards of Care in Overweight and Obesity—2025" (17) provides strategies on how to ensure approaches and environments are nonstigmatizing. Additional details regarding assessment of prior experiences of weight bias and stigma are described in "Weight History," below.

The subsections that follow are organized in order as presented in Table 3.3 with the goal of providing additional information to health care professionals on each component, including evidence supporting its inclusion as well as using the information to guide the diagnostic evaluation and treatment plan.

Weight History

Obtaining a weight history and identifying contributing factors to weight gain are paramount in understanding individuals' determinants of obesity (Table 3.4), which may inform risk stratification, diagnostic evaluation, and treatment approach (80). Weight history also offers an opportunity to build or strengthen the relationship between the individual and health care professional, as obtaining this information with empathy may help build rapport and trust and support improved health outcomes (81–84). Individuals with obesity want to be treated with care and respect and ideally prefer a clinician who listens to them (78).

Asking individuals to recall their body weight trajectory and weight change pattern helps the health care professional to understand the individual's journey over their life course as well as appreciate the life events and other factors that contribute to weight gain and weight loss. This information may also help to identify individuals who should be evaluated for secondary causes of weight gain (e.g., hypothyroidism, hypercortisolemia) (2). Of note, not all individuals with obesity should be screened for these causes—testing should be focused on those with other symptoms of these conditions. These life course weight trajectories may be identified by asking the individual to graph their weight using a "life events weight graph" (Fig. 3.3) (2) or viewing a weight graph in the EHR.

Maximum nonpregnant body weight, defined as the highest BMI during adulthood, is another historical factor predictive of disease risk in longitudinal studies (85,86). For example, an analysis of 225,072 adults found that participants with maximum BMI in the overweight, obesity class 1 (BMI 30–34.9 kg/m^2) and obesity classes 2 and 3 (BMI $\geq$35 kg/m^2) groups had significantly and progressively increased risk for all-cause mortality as well as cardiovascular disease, cancer, and respiratory disease mortality compared with those who maintained their weight in the normal range long-term (85). Therefore, adult body weight maximum can inform risk assessment. Adult body weight minimum can help set realistic treatment expectations, as returning to their lowest weight

TABLE 3.3 Components of a comprehensive clinical evaluation for overweight and obesity at initial, follow-up, and annual visits

Component	Visit		
	Initial	Follow-up	Annual
Medical, psychosocial, and family history			
Weight history			
• Body weight trajectory and weight change pattern over the life course	✓		
• Adult body weight maximum and minimum	✓		
• Age at onset	✓		
• Family history of obesity in first-degree relative	✓		
• Previous and current obesity treatment plans and response	✓	✓	✓
• Identify prior experiences of weight bias or stigma	✓		
Medications and supplements			
• Current medication plan, including active and inactive medications	✓	✓	✓
• Complementary and alternative medication and supplement use, including compounded medications	✓	✓	✓
• Use of weight-promoting medications	✓	✓	✓
• Medication-taking behavior, including rationing of medications	✓	✓	✓
• Medication intolerance, adverse effects, and allergies	✓	✓	✓
Surgical and procedure history			
• Metabolic-bariatric surgery, metabolic-bariatric endoscopic procedure, or other procedure for weight reduction	✓		✓
• Lifestyle behavioral factors			
• Personal goals and readiness to change	✓	✓	✓
• Eating patterns, food intake, and physical activity, including personal and cultural preferences related to these factors	✓	✓	✓
• Stress and coping	✓	✓	✓
• Sleep	✓	✓	✓
• Technology use (e.g., health apps, tracking devices)	✓	✓	✓
• Visits to interprofessional health care team members (e.g., registered dietitian nutritionist, psychologist, physical therapist, community-based programs)	✓	✓	✓
Social factors			
• Assess daily routine and environment, including work or school schedules and ability to engage in obesity treatment plan	✓	✓	✓
• Inquire about insurance status, including coverage of obesity treatments	✓		✓
• Assess tobacco, alcohol, cannabis, and substance use	✓		✓
• Identify existing social supports	✓		✓
• Identify social determinants of health (e.g., food security, housing stability, transportation access, financial security, community safety)	✓		✓
• Identify prior experiences of emotional or physical trauma	✓		
History (or symptoms) of obesity-related diseases and complications			
• Prediabetes or type 2 diabetes	✓		✓
• Elevated blood pressure or hypertension	✓		✓
• Abnormal lipids or dyslipidemia	✓		✓
• Atherosclerotic cardiovascular disease	✓		✓
• Heart failure with preserved ejection fraction	✓		✓
• Metabolic dysfunction–associated steatotic liver disease or metabolic dysfunction–associated steatohepatitis	✓		✓
• Obstructive sleep apnea; screen for obstructive sleep apnea (e.g., STOP-Bang questionnaire [307])	✓		✓
• Knee osteoarthritis	✓		✓
• Other obesity-related conditions (e.g., atrial fibrillation, PCOS, asthma, urinary incontinence, idiopathic intracranial hypertension, lymphedema, gastroesophageal reflux disease)	✓		✓
• Visits to specialists	✓		✓
• Family history of obesity-related diseases or complications in first-degree relative	✓		✓
• Assess functional status, activities of daily living, and disability	✓		✓
• Self-reported health status	✓		✓
History of mental health conditions associated with obesity			
• Disordered eating; screen for disordered eating (e.g., Questionnaire on Eating and Weight Patterns [308] or brief Eating Disorder Examination Questionnaire [EDE-Q7-Brief] [309])	✓		✓
• Depression; screen for depressive symptoms (e.g., PHQ-2 or PHQ-9 questionnaire [310])	✓		✓
• Anxiety; screen for anxiety symptoms (e.g., GAD-2 or GAD-7 [311])	✓		✓
History of other concurrent medical or psychological conditions			
• Other medical conditions not necessarily related to obesity (e.g., pancreatitis, glaucoma)	✓		✓
• Other mental health conditions or symptoms (e.g., schizophrenia, ADHD, suicidal ideation)	✓		✓

Continued on p. 10 »

« *Continued from p. 9*

TABLE 3.3 Components of a comprehensive clinical evaluation for overweight and obesity at initial, follow-up, and annual visits (Continued)

Component	Visit		
	Initial	Follow-up	Annual
Reproductive status for people of childbearing potential			
• Menstrual status	✓		✓
• Contraception strategy	✓	✓	✓
• Current lactation status	✓		✓
• Upcoming plans for pregnancy	✓	✓	✓
Physical examination			
Anthropometrics			
• Measure height* and weight; calculate BMI	✓	✓	✓
• Measure WC if indicated;** calculate WHtR	✓	✓	✓
Vital signs			
• Measure blood pressure using appropriately sized cuff and procedures	✓	✓	✓
• Measure heart rate	✓	✓	✓
• Physical examination			
• Cardiac exam	✓		✓
• Pulmonary exam	✓		✓
• Dermatologic exam (e.g., acanthosis nigricans, intertrigo, acne, hirsutism, male-pattern hair loss, hyperpigmented abdominal striae)	✓		✓
• Throat and neck exam (e.g., crowded oropharynx, neck circumference, palpate thyroid)	✓		✓
• Extremities exam (e.g., lymphedema, disproportionate and symmetric increase of adipose tissue in the legs with sparing of the feet that is tender to palpation, suggestive of lipedema)	✓		
Laboratory evaluation and diagnostic testing			
Identify or monitor obesity-related diseases or complications			
• A1C	✓	✓	✓
• Lipid profile, including total, LDL, and HDL cholesterol and triglycerides	✓		✓
• Echocardiogram if indicated	✓		✓
• Aspartate aminotransferase, alanine aminotransferase, and platelet count; calculate FIB-4 (312)	✓		✓
• Vibration-controlled transient elastography if indicated	✓		
• Sleep study if indicated	✓		
• Knee X-ray if indicated	✓		
Identify secondary causes of weight gain			
• Thyroid-stimulating hormone in people with symptoms of hypothyroidism if indicated	✓		
• Salivary cortisol in people with symptoms of hypercortisolemia if indicated	✓		
• Total testosterone in people with symptoms of PCOS if indicated	✓		
Other factors influencing treatment plan			
• Serum creatinine and estimated glomerular filtration rate	✓		✓
• Urine pregnancy test in people of childbearing potential if indicated***	✓		
• ECG if indicated	✓		
• Vitamin and mineral status if indicated (e.g., 25-OH vitamin D, vitamin B12, iron, ferritin)	✓		✓

ADHD, attention-deficit/hyperactivity disorder; ECG, electrocardiogram; FIB-4, fibrosis-4 score; GAD, generalized anxiety disorder; PCOS, polycystic ovarian syndrome; PHQ, Patient Health Questionnaire; WC, waist circumference; WHtR, waist-to-height ratio. *Height should be measured at the initial visit and annually thereafter. **WC should be measured in adults with a non-Asian background when BMI is between 25 and 29.9 kg/m^2 and in adults with an Asian background when BMI is between 23 and 27.5 kg/m^2. ***Urine pregnancy test should be checked initially if appropriate for the treatment plan and as needed thereafter.

as an adult is not the primary treatment goal. Instead, treatment goals should be set collaboratively between the individual and clinician that focus on achieving clinically meaningful health and quality-of-life benefits, such as preventing or improving obesity-related diseases and complications.

Age at onset of obesity is a key characteristic to evaluate, as it aids health care professionals in understanding if the individual has been living with obesity for most of their life or if they started to experience weight gain in recent years. Longitudinal studies show that development of obesity in childhood predicts future obesity in adulthood (87), and weight gain in early adulthood through midlife is associated with increased risk of cardiovascular disease (88,89), type 2 diabetes (90), metabolic dysfunction–associated steatotic liver disease (91,92), some cancers (93), and other major chronic diseases (22). Inherent in the concept of early development of obesity is the effect of long-term exposure or "years lived with obesity." An analysis of nearly 1.5 million adults found that the relative risk of all-cause mortality was highest among individuals with the longest exposure to elevated weight (94). In another longitudinal study of 20,746 participants, a dose-response relationship was observed between the duration of obesity and all risk factors for cardiovascular disease, particularly A1C (95). Among individuals with a history of severe childhood-onset obesity (BMI ≥99th percentile) (96), health care professionals should consider referring for evaluation for rare genetic obesity syndromes (4).

TABLE 3.4 Information on history elements unique to a comprehensive clinical evaluation for overweight and obesity

Element	Rationale	Sample questions	Tips and tools	Actions
Weight history				
Body weight trajectory and weight change pattern (2,27,88,313–316)	• Understand the individual's journey by appreciating the multidimensional factors that contributed to weight gain • Employ empathy and understanding to build rapport	• How has your weight changed over the course of your life? • What events contributed to your weight gain? • What events contributed to any prior weight losses?	Pre-visit or visit questionnaire can facilitate data collection Have the individual complete a "life events weight graph" before or during visit (see Fig. 3.3) Review questionnaire or obtain history during visit Employ empathy and acknowledgment Review weight graph in the EHR	Establish partnership between health care professional and individual
Adult body weight maximum and minimum (85,86,317,318)	• Maximum BMI is associated with increased risk for obesity-related complications and mortality	• What was your highest body weight as an adult? • What was your lowest body weight as an adult? • At what weight did you feel your best? • What is hard to do at your current weight?		Inform risk assessment Set realistic expectations
Age at onset (80,319)	• Early onset associated with increased risk for obesity-related complications • History of severe childhood-onset obesity may warrant evaluation for genetic obesity syndromes (4)	• At what age did a health care professional first state that they were concerned about your weight? • At what age were you first concerned about your weight? • Do you recall any life events or other contributing factors that occurred at this time?		Inform risk assessment and prognosis Inform diagnostic evaluation
Family history of obesity (97–99,320–322)	• Genetic predisposition; may influence increased risk of obesity	• Do any other family members have excess weight?		
Obesity treatment plan and response	• Understand the individual's perspectives, preferences and considerations for a treatment plan	• What have you done or tried in the past to manage your weight? • If so, what strategy has been the most successful for you in managing your weight? • What methods, if any, are you currently using to manage your weight? • Have you ever worked with a health care professional to manage your weight?		Inform treatment plan
Weight bias and stigma (323,324)	• Understand the individual's lived experience due to their weight • Build trust	• Have you ever been teased because of your weight? • Have you ever been treated unfairly because of your weight? • Have you ever been discriminated against because of your weight? • If so, how have these experiences affected your mental and physical health?	If individual reports weight-stigmatizing experiences, evaluate for internalized weight bias	Tailor communication strategy and treatment plan
Lifestyle and behavioral factors				
Personal goals and readiness to change (110–114)	• Understand the individual's motivation and timing to consider treatment • Establish readiness, importance and confidence in related to the treatment plan	• What factors make you ready to take action toward weight management right now? • On a scale of 1–10, how confident are you in your ability to make changes to manage your weight (e.g., changing eating habits or food intake, increasing physical activity, taking medication)?	Use brief motivational interviewing technique of a readiness ruler (scale of 1–10 readiness for, importance of, or confidence in change) Compare ratings of importance and confidence	Engage in collaborative goal setting Identify barriers and facilitators of change

Continued on p. 12 »

« Continued from p. 11

TABLE 3.4 Information on history elements unique to a comprehensive clinical evaluation for overweight and obesity (Continued)

Element	Rationale	Sample questions	Tips and tools	Actions
		• On this scale, why is your score not lower? Why is it not higher? • On a scale of 1–10, how important is it to you to make changes to manage your weight (e.g., changing eating habits or food intake, increasing physical activity, taking medication)? • On this scale, why is your score not lower? Why is it not higher?		
Eating patterns and food intake	• Understand the individual's eating habits, usual food intake, meal planning • Understand the individual's preferences and cultural influences regarding food • Diet history can be obtained by using several methods: ○ Typical day recall ○ 24-h food recall ○ Food frequency ○ Food diary	Use typical day recall approach: • What is a typical day like for you? • What time do you wake up? • What time do you first eat or drink something? • What do you have? When is the next time you eat or drink something? (Continue to ask this question until you get to the end of the day.) • What time do you go to bed? • Do you ever eat or drink something after you have gone to bed? • How does your cultural background influence your eating habits?	Previsit or visit questionnaire can facilitate collection of diet history Consider using a questionnaire such as Rapid Eating Assessment for Participants–Short Version (REAP-S) (117,118)	Identify abnormal eating habits; refer for mental health evaluation Inform nutrition plan
Physical activity	• Understand the individual's level of physical activity and sedentary behavior • Understand the individual's preferences and cultural influences regarding physical activity	• On average, how many days per week do you engage in moderate physical activities like taking a brisk walk? For how many minutes do you do this activity? • On average, how many days per week do you engage in strenuous physical activities like going for a run? For how many minutes do you do this activity? • How much do you enjoy physical activity? • On average, how many hours per day do you spending sitting for work or during leisure time? • How does your cultural background influence your physical activity habits?	Integrate "exercise as a vital sign" into clinic protocols (119,120) Consider using a questionnaire such as Physical Activity Readiness Questionnaire for Everyone (PAR-Q+) (325)	Identify physical activity limitations; refer to physical therapy as appropriate Inform physical activity plan
Stress (122–124)	• Understand current stressors that may be triggers for unhealthy behaviors and challenge the treatment plan	• What are the current sources of stress in your life?	Consider using a questionnaire such as Perceived Stress Scale (PSS) (326–328)	Identify need for mental health evaluation Set stress management goals
Sleep (125–127)	• Insufficient sleep hours (<6 h) associated with increased obesity • Night shift workers have increased risk of obesity	• How many hours of actual sleep do you get at night? • Do you have difficulty falling asleep? Do you have difficulty staying asleep? • Do you experience sleepiness or fatigue during the day? • Do you work night shift?	Consider using a questionnaire such as: • Pittsburgh Sleep Quality Index (129) • Epworth Sleepiness Scale (329)	Identify need for evaluation with behavioral sleep medicine professional Set sleep goals

Continued on p. 13 »

« Continued from p. 12

TABLE 3.4 Information on history elements unique to a comprehensive clinical evaluation for overweight and obesity (Continued)

Element	Rationale	Sample questions	Tips and tools	Actions
Technology (130,131,330)	• Assess familiarity with digital resources including smartphone apps and tracking devices (e.g., home scale, smart watch)	• Have you used or are you familiar with any apps or online resources that support weight management? • If so, have they been helpful to you in managing your weight? • Do you have a scale at home?	EHR may be able to integrate some tracking data from apps or devices	Inform treatment plan
Social factors (select)				
Social support (138)	• Understand the social resources available to support or undermine the management plan	• What support do you have from family or friends to make changes in your daily routine?	Previsit or visit questionnaire can facilitate data collection	Identify need for referral to behavioral health professional or social work
Social determinants of health (149,152,153,331)	• Understand context and lived experience of the individual • Identify social factors that may present barriers to engagement in management plan such as housing instability, food insecurity, access to safe and affordable resources for physical activity, or lack of transportation	• I want to ask you about your social and financial situation so we can determine if you need additional resources to support you on your weight management journey. Some of these questions may be a little sensitive, and if you do not feel comfortable answering, that is okay. • Could you describe your current living situation? • Do you have resources (parks, sidewalks, community centers) in your neighborhood to use for physical activity? • Do you feel safe walking around in your neighborhood? • Some people experience trouble paying for certain things they need to make it day-to-day. Have you ever or recently had that experience? • Because people may sometimes have trouble paying for things like food, we can become worried about not having enough food to last. Have you ever or recently worried about food running out before you have money to buy more? Have you experienced the food you bought not lasting and your not having money to get more? • Have you experienced trouble with transportation to medical appointments, work, or other things related to daily living?	EHR may have tools available to evaluate social determinants of health Consider using a questionnaire such as Accountable Health Communities Health-Related Social Needs screening tool (332)	Identify need for referral to social work or community health worker

EHR, electronic health record.

People's weight changes in different ways over the course of their lives. Some people may slowly gain weight upwards over time, while others may recall an event happening after which they gained weight quickly. Some people describe weight gain following some events and weight loss following other activities. **This graph can help tell the story of how your weight has changed over time.**

- **Please fill in life events or activities that you relate to changes in your weight.** For example, people may recall periods of weight gain due to pregnancy, a stressful job, death in the family, new medication, or physical injury, and people may identify periods of weight loss that occurred with lifestyle changes, participating in a commercial program, or taking a medication.
- **Take note of your pattern so that you and your health care professional can better understand your weight history together.** Your health care professional may also use this information to help determine an evaluation or treatment strategy that might work best for you.

Here are some example weight graphs that might help you make your own graph:

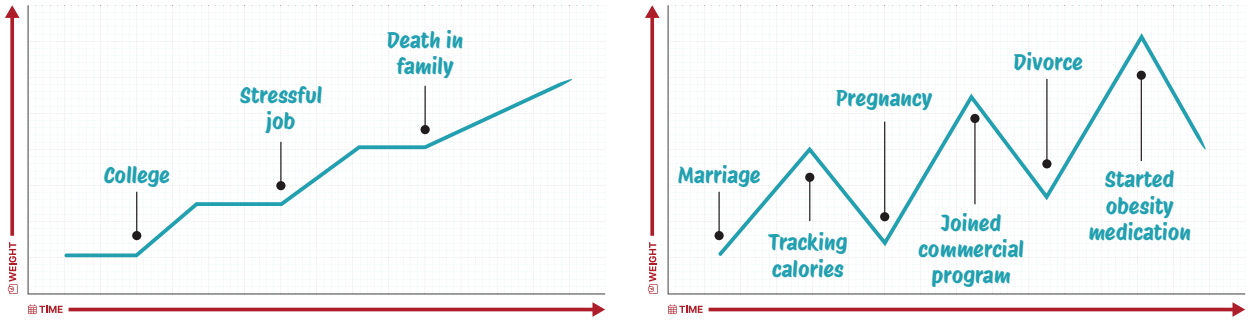

FIGURE 3.3 Sample life events weight graph. Shown is a sample life events weight graph that health care professionals may consider using as a tool when obtaining a weight history. This figure was adapted with permission from Kushner and Kushner (337).

As part of the weight history, health care professionals should be aware of the presence of obesity among individuals' first-degree relatives. Family history reflects the complex interplay of genetic susceptibility and shared environmental exposures. Prior research has shown that personal obesity and family history of obesity in first-degree relatives is highly correlated (97), and this family history of obesity is also associated with significantly increased risk of obesity-related diseases and complications in the individual, including dyslipidemia, hypertension, and type 2 diabetes. While rare functional single-gene mutations associated with obesity have been identified (98), the heritability of obesity is most commonly polygenic, a cumulative effect of many common genetic variants. In fact, a genome-wide polygenic score has quantified the inherited susceptibility to obesity and severe obesity over the life course (99). Research suggests that lifestyle behaviors (physical activity, sedentary behavior, diet, alcohol

consumption, and sleep duration) may modify this polygenic risk of obesity (100). Among individuals with high genetic risk, the HR for incident obesity was 2.16 (95% CI 1.59–2.94) among individuals with healthy lifestyles relative to 3.54 (95% CI 2.63–4.77) among individuals with less healthy lifestyles (100). Finally, family history may be important in identifying individuals who may have subcutaneous adipose tissue disorders (3), given the heritability of some of these conditions. In particular, health care professionals should be aware of the clinical features of lipedema (101), which typically presents as symmetrical, bilateral enlargement of subcutaneous adipose tissue in the extremities, accompanied by pain or discomfort, as lipedema occurs more commonly than the other disorders.

The weight history should include prior and current treatments for obesity (Table 3.4). For this component, the health care professional should ascertain the nature of the therapeutic intervention, how it was administered or supervised, the duration of treatment, and treatment response. Clinicians should inquire about the following interventions: self-directed approaches, supervised lifestyle management (e.g., nutrition, physical activity, behavioral counseling), pharmacotherapy, supplements, and metabolic-bariatric surgical procedures or endoscopic procedures or devices (e.g., Roux-en-Y gastric bypass, sleeve gastrectomy, endoscopic sleeve gastroplasty, intragastric balloon). It is also important to determine if the individual has seen a registered dietitian nutritionist or behavioral health professional or has attended a commercial or community-based program. This information can be used to help formulate a treatment plan based on experience, responsiveness, and self-efficacy (the individual's belief in their ability to carry out and succeed with the treatment).

Past experiences of weight bias and stigma may influence health status and treatment outcomes (17,102); therefore, the health care professional should be aware if this history is present. Table 3.4 includes three simple questions that health care professionals can ask to assess the individual's experience with weight stigma. If any prior weight stigmatization is identified, the health care professional should consider evaluation for internalized weight bias in the individual (e.g., Weight Bias Internalization Scale [103], Weight Self-Stigma Questionnaire [104]). Internalized weight bias is characterized by self-derogation and negative weight stereotypes that individuals apply to themselves because of their body weight, which has strong associations with adverse mental health outcomes and may also negatively affect physical health (105).

Medications and Supplements

In addition to typical components of a medication history (Table 3.3), health care professionals should include an assessment of prior and current use of weight-promoting medications. In an analysis of 132,057 participants with overweight or obesity in the All of Us research program, 36% used at least one weight-promoting medication and approximately 20% used more than one weight-promoting medication (106). In the Look AHEAD: Action for Health in Diabetes (Look AHEAD) trial, which tested the outcomes of an intensive lifestyle intervention among adults with overweight or obesity and type 2 diabetes, exposure to at least one weight-promoting medication significantly decreased the odds of achieving ≥5% weight loss by 32% and achieving ≥10% weight loss by 19% (107). "Pharmacologic Treatment of Obesity in Adults: Standards of Care in Overweight and Obesity" (30) provides detailed information to aid health care professionals in identifying weight-promoting medications as well as non–weight-promoting alternatives that may be possible substitutes. Given their increasing use as well as safety and efficacy concerns, identifying complementary or alternative medication and supplement use, including compounded medications, is important (Table 3.3).

Lifestyle and Behavioral Factors

A comprehensive evaluation includes assessing multiple lifestyle behaviors, as these factors may contribute to weight gain as well as affect an individual's ability to engage in and maintain treatment. Table 3.3 provides an overview of these factors, while Table 3.4 provides detailed and pragmatic information related to these domains. When possible, an interprofessional team should be involved in the evaluation of lifestyle and behavioral factors, which include registered dietitian nutritionists, behavioral health professionals, and physical activity professionals. Other health care professionals who deliver lifestyle interventions may also be engaged, as they often have skills in assessing lifestyle and behavioral factors (e.g., health coaches). A future section of the "Standards of Care in Overweight and Obesity" will provide additional recommendations regarding lifestyle assessment and treatment of obesity in adults.

Assessing an individual's personal goals helps the clinician understand that individual's motivation to consider treatment, which affects the collaborative treatment goals agreed upon by the health care professional and the individual. A systematic review identified goal setting as an effective health behavior change tool among individuals with obesity (108). Personal goals may also influence treatment outcomes. Within a community weight loss program, individuals motivated to seek treatment for health reasons were significantly less likely to drop out and had significantly greater weight losses than individuals motivated by appearance (109). Clinicians should also understand the individual's readiness to change (110–112), which may influence timing of treatment as well as identify barriers to and facilitators of change. Motivational interviewing or the 6As model may be a helpful strategy to support behavior change in obesity care (113,114).

Key lifestyle behavioral factors relevant to obesity include eating patterns, current dietary intake, engagement in physical activity, and sedentary time (physical inactivity)

(115,116). Registered dietitian nutritionists and physical activity professionals may be involved in assessing these factors. Alternatively, health care professionals can use simple tools identified in Table 3.4, such as the 16-item Rapid Eating and Activity Assessment for Patients—Shortened Version (REAP-S) (117,118) or 2-item Exercise Vital Sign tool (119,120). These assessments provide information on baseline health behaviors that can help both the health care professional and the individual identify areas for improvement as well as track progress over time.

Other key lifestyle behavioral factors to assess are stress and sleep. A longitudinal cohort study of 2,570 adults identified significant relationships between psychosocial stress and weight gain in both men and women (121). Clinicians should ask about current stressors among all individuals, as these factors may interfere with uptake of and engagement in the treatment plan (122–124). While the relationship between obesity and obstructive sleep apnea is discussed in "Assessing Obesity-Related Diseases and Complications," below, other sleep factors have been associated with obesity, including inadequate sleep, short sleep duration, and poor sleep quality (125–128), which may negatively affect treatment outcomes. Sleep can be assessed by simply asking individuals how many hours of sleep they get per night or administering a tool such as the Pittsburgh Sleep Quality Index (129). Based on the individual's experience with stress or sleep problems, referral to behavioral health or behavioral sleep medicine professionals, respectively, may be warranted.

Finally, health care professionals should inquire about access to and familiarity with devices and digital resources that may be helpful tools in the treatment plan. For example, individuals may not have access to a scale in their home for self-weighing (130), while smartphone apps may be helpful tools for self-monitoring lifestyle behaviors such as food intake, physical activity, and sleep (131).

Social Factors

An assessment of social factors is important to include in a comprehensive evaluation, as these elements may affect individuals' ability to access, engage, and maintain the treatment plan. In addition to typical components of a social history (Table 3.3), health care professionals should inquire about insurance status and be familiar with benefits coverage for obesity treatment services, including nutritional counseling, obesity medications, and metabolic-bariatric surgery. Coverage for these services varies widely by state and insurance type (132–134). Some individuals have no or limited insurance coverage for obesity care, which may restrict access to treatment, especially obesity pharmacotherapy (135–137). Limited access is more common among racial and ethnic minoritized groups as well as low-income individuals (135).

The comprehensive evaluation is an opportunity to identify the individual's support system (Table 3.4) (74). Assessing one's level of social support among family, friends, and their community can help inform the treatment plan. Undermining of attempts to eat healthier by family members (138) as well as belonging to a community with a strong affinity for unhealthy eating habits (139) can derail an individual's efforts to manage their weight. In contrast, a good source of social support along one's weight management journey is associated with increased likelihood of continuing treatment and improved outcomes (138–141). Discussing the topic and helping individuals to establish and refine their support system will help maintain support in following the treatment plan between visits.

Contextual and structural factors such as culture, marital status, socioeconomic status, nutrition insecurity, housing instability, racism, and built environment contribute to weight gain and obesity. They may also create treatment access and engagement barriers (142–155). For example, obesity is more prevalent among racial and ethnic minoritized groups as well as groups with low socioeconomic status (150,151). However, the relationship between social determinants of health and obesity can be complex, as some groups can be more affected than others. For instance, experiencing nutrition insecurity was significantly associated with greater BMI among NHANES participants, particularly among women (147,148), who also tended to experience lower levels of social support (152). Furthermore, one health system–based study found that living in a high-resourced built environment (e.g., greater availability of supermarkets and fast food restaurants) was associated with less weight gain over time among non-Hispanic White and Black/African American individuals compared with individuals with other backgrounds (153). When assessing social determinants of health in clinical practice, health care professionals should consider using a reliable and pragmatic screening questionnaire (e.g., Accountable Health Communities Health-Related Social Needs screening tool) (156) or a conversational approach (Table 3.4). Given that clinicians are likely to identify individuals with social risks, they should consider establishing trusted partnerships with local organizations to facilitate referrals to social services or community-based resources that address adverse social determinants of health (157–159). Referral to a social worker or community health worker should be considered for individuals experiencing adverse social determinants of health.

Prior experiences of trauma have been associated with obesity. For example, history of adverse childhood experiences, such as abuse, neglect, and household dysfunction, has been associated with high risk of obesity in adulthood (160). A systematic review identified that traumatic experiences and posttraumatic stress disorder were risk factors for developing obesity (161). Among adults pursuing metabolic-bariatric surgery, a third reported experiencing sexual violence in the past (162). Health care professionals should consider applying a trauma-informed care approach, where appropriate, when evaluating individuals

with obesity (163,164). In brief, a trauma-informed care approach recognizes the widespread impact of trauma and promotes environments of safety, trustworthiness, and collaboration (165). If a prior trauma experience is identified, clinicians should be prepared to refer the individual to appropriate resources for further evaluation.

Assessing Obesity-Related Diseases and Complications

Obesity is associated with over 200 diseases and complications involving every organ system; their development is driven by mechanistic changes including increased mechanical stress, insulin resistance, ectopic adipose accumulation, and systemic inflammation (166). For example, a longitudinal cohort study using the UK Biobank database (*n* = 392,541) found that obesity was associated with increased risk of 27 noncommunicable chronic diseases, with the highest risk being for type 2 diabetes (HR 6.61, 95% CI 6.25–6.99), osteoarthritis (HR 2.59, 95% CI 2.51–2.68), and hypertension (HR 2.35, 95% CI 2.29–2.41) (167). Importantly, the risk of having multiple long-term conditions (multimorbidity) increases with increasing BMI (168,169)—people living with obesity may be affected by multiple diseases and complications. A meta-analysis of 43 studies (*n* = 969,130) found that the risk of developing multiple long-term conditions was 1.75 times higher for individuals with obesity than for individuals without obesity (170).

An estimated 20–60% of people living with obesity experience psychosocial concerns (171), and the most common mental health conditions include depression, anxiety, eating disorders, and disordered eating behaviors (171–178). There is also growing evidence of relationships between obesity and attention-deficit/hyperactivity disorder (178) as well as substance use disorders (171). While associations between obesity and mental health conditions are incompletely understood, studies suggest several possible explanations. Biological pathways, such as systemic inflammation or hypothalamic-pituitary-adrenocortical axis dysregulation, could explain the relationships (176–178). In addition, the experience of weight stigma and discrimination, which has been demonstrated to exacerbate symptoms of depression, anxiety, and eating disorders, may contribute (171,177). Furthermore, some evidence suggests a bidirectional relationship between obesity and mood disorders (depression and anxiety), particularly among women (171,176–178). In a meta-analysis of 15 longitudinal studies, individuals with obesity had a 55% increased risk of developing depression in their lifetime, while individuals with depression had a 58% risk of developing obesity (179). A recent cohort study with >16,000 European adults found that people living with overweight or obesity experienced increased depression scores and decreased quality of life over a subsequent 10-year period (180). In addition, binge eating disorder is the most common eating disorder reported by individuals with obesity, and it has an estimated prevalence of 5–15% among individuals seeking metabolic-bariatric surgery (171). Research has found that the prevalence of binge eating disorder increases with greater severity of obesity (178). Given this body of evidence, it is important for health care professionals to use validated tools to screen for mental health conditions commonly identified among people with obesity, particularly to identify symptoms concerning for depression, anxiety, eating disorders, and disordered eating behaviors (Table 3.3). Individuals with concerning symptoms should be referred for additional evaluation to qualified behavioral health professionals, ideally ones with experience in obesity. Overall, it is important for clinicians to use a comprehensive biopsychosocial assessment to inform the management plan.

Table 3.5 provides an overview of common obesity-related diseases and complications in adults, and health care professionals may already be aware of the presence of many of these obesity-related diseases and complications in individuals with whom they have established care relationships or who have previously received care within their health system (e.g., documented in the EHR's problem list or past medical history section). Given the resources and time available in clinical practice, health care professionals may need to initially focus their assessment on conditions relevant to the individual's personal or family history. In addition, the assessment should prioritize identifying history of or screening for symptoms concerning for key diseases and complications that may influence the treatment approach or treatment outcomes: prediabetes, type 2 diabetes, hypertension, dyslipidemia, atherosclerotic cardiovascular disease (ASCVD), heart failure with preserved ejection fraction, metabolic dysfunction–associated steatohepatitis, obstructive sleep apnea, knee osteoarthritis, disordered eating, disordered eating behaviors, depression, and anxiety (Table 3.3). In addition to obtaining the history and symptoms of obesity-related diseases and complications, health care professionals should ensure that their physical examination includes the necessary components to evaluate for signs of disease or diagnose the aforementioned key conditions (e.g., blood pressure measurement, cardiac exam). Finally, clinicians should ensure that individuals have had laboratory and diagnostic testing appropriate for their clinical context. In many individuals, it may be reasonable to screen for prediabetes and type 2 diabetes with A1C (181), screen for dyslipidemia and assess ASCVD risk with a lipid profile (182), and assess AST, ALT, and platelet count to calculate fibrosis-4 score for metabolic dysfunction–associated steatohepatitis (183).

Factors Impacting Obesity Care or Influencing the Treatment Plan

Beyond obesity-related conditions, health care professionals should be aware of other medical or psychological conditions within each person that incidentally coexist with obesity. Some may complicate obesity care or treatment outcomes, which might include increasing the potential for drug-drug interactions, whether it be a

TABLE 3.5 Overview of common obesity-related diseases and complications in adults by domain

Domain	Obesity-related diseases and complications
Metabolic/endocrine	• Dyslipidemia • Gestational diabetes • Metabolic syndrome • Prediabetes • Type 2 diabetes (T2D)
Cardiovascular	• Atrial fibrillation • Coronary artery disease (CAD) • Heart failure with preserved ejection fraction (HFpEF) • Heart failure with reduced ejection fraction (HFrEF) • Hypertension • Peripheral vascular disease (PVD)
Gastrointestinal/hepatic	• Cholelithiasis • Gastroesophageal reflex disease (GERD) • Metabolic dysfunction–associated steatohepatitis (MASH) • Metabolic dysfunction–associated steatotic liver disease (MASLD)
Musculoskeletal	• Degenerative joint disease • Gout • Osteoarthritis • Plantar fasciitis
Pulmonary	• Asthma • Pulmonary artery hypertension • Obesity hypoventilation syndrome (OHS) • Obstructive sleep apnea (OSA)
Oncologic/hematologic	• Breast cancer • Colorectal cancer • Deep venous thrombosis (DVT) • Endometrial cancer • Pulmonary embolism (PE) • Prostate cancer • Ovarian cancer
Neurologic/ophthalmologic	• Idiopathic intracranial hypertension (IIH) • Stroke
Renal/urologic	• Focal segmental glomerulosclerosis • Stress incontinence
Reproductive	• Infertility • Male hypogonadism • Polycystic ovarian syndrome (PCOS) • Uterine fibroids
Dermatologic	• Hidradenitis suppurativa • Lymphedema • Venous stasis
Immunologic/infectious	• Poor outcomes with infections (e.g., COVID-19) • Susceptibility to infection
Psychologic	• Anxiety • Binge eating disorder • Depression • Night eating syndrome • Stigmatization
Functional limitations	• Limitations in mobility • Limitations in activities of daily living (ADL)

Diseases and complications presented were informed by several sources (15,333,334); however, health care professionals should be aware that this list is not exhaustive of all obesity-related conditions.

contraindication to a specific obesity medication, requiring nutritional modifications, or limiting engagement in physical activity. In addition, health care professionals should consider laboratory and diagnostic testing appropriate for each individual's clinical context that may influence the treatment plan as well as identify secondary causes of weight gain, if clinically indicated (Table 3.3). Reproductive status is particularly important among people of childbearing potential, as pregnancy and lactation affect treatment options and timing of treatment.

Risk Stratification

The information obtained during the comprehensive clinical evaluation can be used for risk stratification, a process to identify each person's risk level that may aid the health care professional in predicting health outcomes and tailoring care. While various strategies can be used, two common approaches to inform risk stratification among people with obesity are *1*) regional distribution of excess adiposity to stratify risk for obesity-related diseases and complications and *2*) the Edmonton Obesity Staging System (EOSS) to stratify risk of morbidity and mortality that informs disease prognosis.

Distribution of adipose tissue influences cardiometabolic disease, where identification of visceral adiposity (typically using WHtR or WC) adds to risk prognostication above BMI alone. Multiple prospective cohort studies confirm the association between visceral adiposity and cardiometabolic risk independent of overall adiposity, including incident metabolic syndrome (184), type 2 diabetes (185), steatotic liver disease (186), cardiovascular risk factors (184,187), cardiovascular disease (188,189), and mortality (188). There is a dose-response relationship between change in visceral adiposity and cardiometabolic risk (9,190,191), which may help guide treatment goals. Health care professionals should be aware that studies have reported conflicting results regarding the association between WC and mortality risk in older adults (192). Decrease in visceral adiposity, as clinically indicated by decrease in WHtR or WC, is associated with reduced cardiometabolic risk. Visceral adiposity may also be a key factor in other noncardiometabolic diseases, which is an area of increasing research interest with implications for overall health risk (193–197).

While several staging and classification systems have been proposed to assess the stage and severity of obesity and its related conditions (198–200), EOSS independently predicts increased mortality beyond traditional adiposity assessments (201). EOSS evaluates the medical, physical, psychological, and functional effects of obesity across five stages (stages 0–4, where higher stages indicate greater severity) (Fig. 3.1). EOSS has been used to provide standardized assessments of severity and functional effect of obesity within clinical research and real-world contexts (202–204), and EOSS may be used to guide treatment decisions (205). Table 3.6 suggests a strategy for operationalizing EOSS within the clinical setting, which may increase

feasibility of EOSS use within clinical and community settings.

Management Strategy

After completing the comprehensive clinical evaluation, health care professionals should collaborate with the individual to develop a management strategy (Fig. 3.1). Clinicians are encouraged to use evidence-based counseling approaches to facilitate shared decision-making when setting goals and developing management strategies or treatment plans. Clinicians' use of the 6As model has been associated with improved outcomes, including increased self-efficacy, intention to change behavior, and weight reduction among people with obesity (19–21). Health care professionals routinely "ask" and "advise" when providing weight-related counseling but often find it challenging to include "assist" and "arrange" in busy clinical encounters (20). Alternatively, using brief motivational interviewing techniques, such as reflective listening, has been associated with weight reduction, as has the individual having a sense of high autonomy support (82,113,206,207). Motivational interviewing is particularly useful when trying to establish an individual's readiness to make health behavior changes and engage in the treatment plan. For example, the health care professional can ask the individual to rate their readiness, importance of the goal, and confidence to meet the goal on a scale of 1 to 10 to evaluate their level of motivation, which may then help identify factors that might increase and maintain their motivation (113,114). An individual's level of readiness can inform tailoring and timing of treatment. When assessing readiness, clinicians will identify some individuals who are not yet ready to make changes or begin treatment. However, it is important to reassess readiness at follow-up visits, as these elements can change over time. Health care professionals need to be prepared to engage in counseling when such a change occurs. Based on available resources and time, clinical practices can consider identifying and referring to other care partners to support evidence-based counseling, such as psychologists, registered dietitian nutritionists, and other allied health professionals (75).

Goals of care should be established. Individuals should be encouraged to set health goals, behavior change goals (e.g., nutrition, physical activity, sleep), and quality-of-life goals (e.g., improved mobility), as goal setting contributes to greater success in changing lifestyle behaviors and greater weight reduction (108,109,206,208,209). Health care professionals should collaborate to set SMART (specific, measurable, achievable, relevant, and time-bound) goals. Goal setting can be combined with other behavior change techniques, such as self-monitoring and problem-solving. Goal setting may involve the use of self-monitoring tools (e.g., home scale, wearables) to provide feedback to the individual and health care professional on implementation of the treatment plan.

Health care professionals should educate patients on obesity as a chronic, relapsing disease. As such, clinicians should anticipate that the initial goals of care and initial management strategy or treatment plan will change over time, thus developing a plan for continuing care is essential. It is important to set expectations for the frequency of follow-up visits and discuss strategies to support engagement in the treatment plan between visits (e.g., social support, working with other care partners, self-monitoring). Previous research indicates that a higher number of visits and longer duration of treatment are significantly associated with greater weight reduction (210,211). However, real-world clinical practice is often challenged by overwhelmed clinic schedules, time constraints during visits, and barriers to care access (e.g., lack of transportation, limited clinic hours) (137), which may make it difficult to implement frequent, in-person follow-up visits. To facilitate timely and effective care, follow-up may be delivered via telehealth, delivered by interprofessional members of the treatment team with experience in obesity care, or supported by community-based or commercial programs with peer-reviewed evidence of their efficacy and safety (212,213) as part of the plan for continuing care. Clinical practices may also consider referral to health care professionals with competency in obesity medicine.

Additional information about treatment selection with the management plan is available in "Pharmacologic Treatment of Obesity in Adults: Standards of Care in Overweight and Obesity" (30) and will be available in future sections of the "Standards of Care in Overweight and Obesity" on lifestyle treatment and metabolic-bariatric procedures.

Longitudinal Care for Individuals With Obesity

Recommendations

3.5 For individuals engaged in obesity treatment, follow-up visits should occur regularly at intervals appropriate to the treatment strategy selected **B**; evaluate the efficacy, safety, and tolerability of the treatment plan **B**; monitor anthropometric measures, vital signs, and laboratory values **A**; inquire about barriers to the treatment plan **C** and, if present, engage the individual in problem-solving to address any challenges **B**; and reassess psychosocial and behavioral factors that may affect treatment outcomes **B**.

Obesity is a chronic disease requiring structured and person-centered care over time. Care is optimized when clinicians engage individuals in regular follow-up that applies principles of chronic disease management, including responding to the evolving needs of each individual and monitoring treatment plan safety and efficacy. This approach reinforces the therapeutic partnership between the individual and the health care professional. Table 3.3 outlines elements of the comprehensive clinical

TABLE 3.6 Operationalization of the Edmonton Obesity Staging System in adults with overweight or obesity

Stage	Obesity-related diseases and complications	Physical symptoms	Psychological symptoms	Functional limitations
0	None • A1C <5.7% • BP <130/80 mmHg • Triglycerides <150 mg/dL • HDL >60 mg/dL • ALT <36 IU/L and AST <33 IU/L	None • No dyspnea on exertion • No aches/pains	None • PHQ-9 score <5 • GAD-7 score <5	None • No impact on daily activities • Self-reported health of "very good" or "excellent" • VO_2 peak/kg over the 25th percentile (normal functional capacity)*
1	Subclinical • A1C 5.7–6.4% or diagnosis of prediabetes • BP 130/80–139/89 mmHg • Triglycerides 150–199 mg/dL • HDL 40–60 mg/dL • ALT ≥36 IU/L or AST ≥33 IU/L; FIB-4 <1.3	Mild • Dyspnea on moderate exertion • Occasional aches/pains	Mild • PHQ-9 score 5–9 • GAD-7 score 5–9	Mild; QoL not impacted • Mild functional limitations in daily activities • Self-reported health of "good" • VO_2 peak/kg between the 10th and 25th percentile (mild reduction of functional capacity)*
2	Established • A1C ≥6.5%, diagnosis of type 2 diabetes, or use of glucose-lowering medication • BP ≥140/90 mmHg, diagnosis of hypertension, or use of BP-lowering medication • Triglycerides ≥200 mg/dL, HDL <40 mg/dL, diagnosis of dyslipidemia, or use of lipid-lowering medication • Diagnosis of metabolic dysfunction–associated steatotic liver disease • Diagnosis of obstructive sleep apnea • Diagnosis of other obesity-related diseases or complications	Moderate • Dyspnea on mild exertion • Regular aches/pains • Joint stiffness • Fatigue • Diagnosis of moderate knee osteoarthritis • Diagnosis of low back pain	Moderate • Diagnosis of depression, use of depression medication, or PHQ-9 score >9 • Diagnosis of anxiety, use of anxiety medication, or GAD-7 score >9 • Diagnosis of an eating disorder	Moderate; QoL impacted • Moderate functional limitations in daily activities • Self-reported health of "fair" • VO_2 peak/kg between the 5th and 10th percentile (moderate reduction of functional capacity)*
3	Severe • Diagnosis of type 2 diabetes with complications • Diagnosis of atherosclerotic cardiovascular disease • Diagnosis of heart failure with reduced ejection fraction • FIB-4 >2.67 or diagnosis of metabolic dysfunction–associated steatohepatitis • Diagnosis of obesity hypoventilation syndrome	Severe • Dyspnea when sitting or sleeping • Angina • Reduced mobility • Diagnosis of severe knee osteoarthritis	Severe • Diagnosis of major depression • Suicidal ideation	Severe; QoL substantially impacted • Unable to work • Significant functional limitations in daily activities • Self-reported health of "poor" • VO_2 peak/kg below the 5th percentile (severe reduction of functional capacity)*
4	Very severe; end-stage disease • Diagnosis of end-stage renal disease • Diagnosis of end-stage heart failure (e.g., AHA stage D) • Diagnosis of cirrhosis • Diagnosis of respiratory failure	Very severe; limited mobility • Continuous dyspnea • Severe lethargy or lassitude • Severely limited mobility	Very severe; disabling • Neglect of basic personal needs • Total anhedonia • Catatonia	Very severe; disabling • Bedbound • Inability to perform daily functions

The schema presented in this table was informed by several research studies (202–205,335); however, health care professionals should be aware that this specific decision tool has not been clinically tested. No studies have attempted to identify stage 4 obesity; therefore, the content listed in relation to this stage was identified through expert consensus. A_{1C}, hemoglobin A_{1c}; AHA, American Heart Association; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BP, blood pressure; FIB-4, fibrosis-4 score; GAD, generalized anxiety disorder; HDL, high-density lipoprotein; LDL, low-density lipoprotein; PHQ, Patient Health Questionnaire; QoL, quality of life; VO, volume of oxygen. *When cardiopulmonary exercise testing is available, the addition of VO_2 peak/kg may enhance Edmonton Obesity Staging System performance (336).

evaluation that should be repeated at follow-up as well as annually. Health care professionals should refer to the appropriate current and future sections of the "Standards of Care in Overweight and Obesity" for information on managing specific treatment strategies long-term (30).

Frequency of Follow-up

Evidence from intensive lifestyle interventions demonstrates that regular, structured follow-up is strongly associated with sustained engagement over time and improved weight loss outcomes (214,215). Real-world studies of obesity medicine clinics further support the importance of consistent follow-up to monitor progress and ensure adherence (210,216). Routine follow-up provides accountability as well as opportunities to troubleshoot barriers, recalibrate goals, support individual values and preferences, and promote long-term adoption of the treatment plan.

For individuals engaged in obesity treatment, follow-up visits should occur at intervals appropriate to the treatment strategy. For example, weekly follow-up visits may be typical as part of an intensive lifestyle intervention, while monthly follow-up visits are recommended during the first 3 months of treatment with an obesity medication (30). In addition, follow-up visit frequency should be tailored to the individual's needs relative to their EOSS stage. Individuals with a higher EOSS stage may warrant more frequent follow-up. Clinical practices should consider engaging team members including pharmacists and nurses to support this care, which may include adjusting concomitant medications to prevent adverse events (e.g., hypoglycemia in individuals with type 2 diabetes, hypotension in individuals taking blood pressure–lowering medications). Clinical practices could consider using remote monitoring technology, if appropriate to the population, to support care. Virtual follow-up has been shown to have similar efficacy to in-person follow-up in some clinical trials (217–219). Little research to date has compared the efficacy of synchronous and asynchronous follow-up care.

Evaluate Response to Treatment Plan

Each follow-up visit should include assessment of treatment efficacy, safety, tolerability, and adherence. Health care professionals should be prepared to modify the treatment plan to support individuals in achieving their health goals. Retrospective data from the National Diabetes Prevention Program highlight the need to monitor individualized responses and intervene early when progress deviates from expected trajectories (220). Treatment intensification to attain goals must be balanced against tolerability of the treatment plan. Assessing efficacy and safety together ensures that the treatment plan remains both effective and tolerable, which may promote long-term persistence.

Monitor Health Outcomes

Long-term obesity care requires monitoring of anthropometric measurements, vital signs, and laboratory values at follow-up. Patient-centered goals should also be monitored at follow-up. Robust evidence supports regular assessment of weight, BMI, WC, blood pressure, A1C, lipid profile, and liver function tests. For example, RCTs of obesity medications consistently demonstrate the importance of monitoring these parameters to detect therapeutic cardiometabolic benefits and avoid adverse outcomes (221–232). Application of a chronic disease framework acknowledges that obesity treatment requires continual support, reinforcement of behavior change strategies, and alignment of interventions with the individual's goals. Regular review of anthropometric measures, vital signs, and laboratory values also normalizes fluctuations in outcomes, celebrates achievements, reduces stigma, and strengthens the partnership between the health care professional and individual with obesity.

Problem-Solving Treatment Plan Barriers

During follow-up visits, the health care professional should assess for any barriers to the treatment plan. Common barriers include changes in treatment access due to insurance benefits coverage, changes in motivation, emotional distress, limited time to implement the treatment plan given competing priorities, body image concerns, and social and internal cues that promote unhealthy eating behaviors (135,136,233–236). In addition, many individuals experience increased appetite with weight reduction, which may lead to weight recurrence or binge eating (236). Problem-solving is an effective approach to helping individuals address barriers. Several studies have demonstrated that providing problem-solving support during obesity treatment leads to greater weight reduction and weight loss maintenance (233,237–240). Health care professionals can use the acronym ADAPT to remember the steps of problem-solving when supporting individuals: normalize the individual's Attitude and experience with barriers, Define or identify the problem, generate Alternative solutions and set a goal, Predict consequences of each potential solution, and Try out and evaluate a solution (241). Using a problem-solving approach during follow-up can help the health care professional and the individual recognize when a referral to another care partner may be necessary to address barriers (e.g., social work for insurance coverage).

Behavioral and Psychosocial Factors Affecting Treatment Outcomes

The health care professional should reassess an individual's engagement in health behaviors (e.g., nutrition, physical activity, sleep) during each follow-up visit to monitor progress with the treatment plan and determine if any changes are needed. Continued engagement in healthy eating, physical activity, and improved sleep has been

associated with greater weight reduction and weight loss maintenance (215,242–244). Behavior change techniques, such as self-monitoring, are also key to continued engagement and treatment success (242,244,245). Self-monitoring tools include food diaries, wearables, and smartphone applications that can be used to track progress on behavior changes, and these data can inform topics to address at follow-up. Some individuals may experience improvement in physical components of quality of life (e.g., physical functioning) (246) and mood (247) with weight reduction. However, newly occurring or recurring episodes of mental health concerns (e.g., depression, anxiety) and chronic stress can be barriers to treatment success. It is important for clinicians to reassess psychosocial factors periodically during follow-up. Health care professionals should engage other care partners in the treatment team, as appropriate, to support the long-term behavioral and psychosocial needs of individuals with obesity.

Clinical Practice Considerations for Obesity Care

Recommendations

3.6 Provide health care professionals with education on obesity treatment **A** as well as professional and technical support **A**, as appropriate, to ensure they are adequately prepared and resourced to deliver obesity care.

3.7 Establish a care process to alert people with overweight or obesity that medical assistance is available for these conditions **A**, as individuals may be unaware of this service in health care settings.

3.8 Implement clinical practice protocols to allocate adequate time for evaluating, staging, and treating obesity, such as weight-focused visits **A** or referring to an embedded health care professional trained in obesity medicine **C**.

3.9 Add a diagnosis of obesity to the medical record of adults who meet the diagnostic criteria **C** using nonstigmatizing diagnosis codes.

Clinical practices may need to implement changes to support the screening, diagnosis, evaluation, and staging of obesity, as obesity diagnosis and related counseling have typically occurred infrequently in health care settings (137,248,249). In fact, research has shown that a minority of clinicians provide the majority of obesity counseling in primary care settings (250). Multiple factors contribute to the lack of obesity care prioritization. While limited time, competing priorities, and inadequate reimbursement for services are often cited (137,251,252), there are other contributing factors that may be amenable to clinical practice modifications. Clinical practices should be mindful of how changes may affect the care experience for people with obesity, as weight stigma and bias may occur within the health care system. See the article "Weight Stigma and Bias: Standards of Care in Overweight and Obesity—2025" for more information (17).

Health care professionals cite lack of education and training on obesity as key factors contributing to their low engagement in obesity care delivery (251,253–255). A systematic review found a paucity of obesity education programs for physicians-in-training globally (70), and research has reported gaps in high-quality weight management training among other health care professionals as well (256). However, clinicians overwhelmingly support additional training and practice-based changes to help them improve their skills in this area (253). Studies have found that providing education on obesity increases health care professionals' understanding of the efficacy of obesity treatment options as well as their self-efficacy for delivering obesity care (204,257–259).

In addition to education, clinicians benefit from professional and technical support to diagnose, evaluate, and treat obesity. Professional support may include providing clinicians access to colleagues with expertise in obesity medicine as well as access to ongoing education on obesity to support their professional development (204,259). Technical support refers to modifications to clinical workflows and protocols as well as the creation of tools to support health care professionals' delivery of obesity care. In particular, technical support should optimize the EHR for chronic disease management, as it capitalizes on the only thing reliably in the room with the health care professional and the individual—the computer. EHR-based best practice alerts for elevated BMI consistently improve clinicians' diagnosis of obesity (260–262). Additional EHR-based tools are likely needed to support care delivery. Promising strategies include pre-visit questionnaires that obtain key information from individuals with obesity (204,263), prebuilt note templates designed for obesity care (204,261,263), and clinical decision support systems that suggest laboratory testing, treatment strategies, and referrals or resources (204,260,261,263,264). These tools have demonstrated acceptability to individuals with obesity participating in these visits (261) and have improved health care professionals' clinical practice habits (263,265). When considering EHR-based tools to support obesity care, they need to be easy to use and integrate with existing clinical workflows. Clinicians also need training on using these tools to support their adoption and continued use (266).

Clinical practices should consider establishing a care process to alert people with overweight or obesity that medical assistance is available. Some people may be unaware of their BMI or unfamiliar with the degree of excess adiposity, as suggested by BMI or WC, that is associated with health risks (46). As a result, these individuals may not seek evaluation or treatment with a health care professional. Other people may not be aware that they can receive obesity-related services in a health care setting.

For example, an analysis of NHANES data found that many individuals with obesity are actively trying to lose weight, but few reported seeking support for this goal from a health care professional (267). This situation is further compounded when the health care professional does not initiate a discussion about obesity (137,268). This may occur due to lack of time, prioritization of other conditions, or preference for the individual with obesity to initiate the discussion. Therefore, it is important for clinical practices to raise awareness of the obesity care services they offer, if such services are offered, in a manner that is not stigmatizing (204,263,265,269).

In addition to education, professional development, and technical support, health care professionals may need clinical practice protocols that support their delivery of obesity care. It is critical for clinicians to have adequate time for evaluating, staging, and treating obesity. Research has shown that the primary care setting has challenging time limitations. One simulation study estimated that primary care clinicians would need approximately 27 h per day to complete all of the work required to provide guideline-recommended preventive, chronic disease, and acute care for individuals on their panels, along with documentation and inbox management (270). A key strategy to address this problem is the creation of weight-focused visits, a specific visit type scheduled where the clinician can focus solely on the evaluation and treatment of obesity (204). This approach allows health care professionals the time necessary to evaluate and treat obesity, and it may also reduce weight stigmatization if the individual is aware of the visit focus. Shared medical visits for weight management may also be considered (271–273). Given the components of a comprehensive clinical evaluation for obesity outlined in Table 3.3, health care professionals clearly need time to complete these assessments comprehensively and provide evidence-based counseling. Some clinical practices may be unable to implement weight-focused visits, and other research has suggested that referring to an embedded health care professional trained in obesity medicine is a promising alternative (264,274,275). Competency in obesity medicine includes having the knowledge and skills to evaluate, examine, diagnose, and treat individuals for obesity and its related diseases and complications (76). Physicians may seek board certification in obesity medicine (276), and certificate and certification programs in obesity medicine are available for nurse practitioners, physician associates, and other health care professionals (277–280). Studies have shown that board-certified obesity medicine physicians offer comprehensive obesity care (77,281,282), and recent research found that most individuals referred to board-certified obesity medicine physicians embedded within primary care were significantly more likely to receive evidence-based obesity treatment and achieve greater weight reduction than matched controls (264).

While clinical practices may need to prioritize the actions in Recommendations 3.6–3.8, it is critical to understand that implementing all these recommendations together leads to improved weight outcomes (Fig. 3.4), which was demonstrated in the PATHWEIGH stepped-wedge cluster-randomized trial, testing a novel care process implemented within all adult-serving primary care clinics across a health system (204,265,269,283). The intervention consisted of three general components: *1*) support from the health system's primary care leadership, *2*) an EHR-driven care process to prioritize, facilitate, and expedite weight management, and *3*) strategies to support health care professionals' education on obesity treatment and implementation of the PATHWEIGH care process. A key strategy was in-clinic signage alerting individuals that medical weight management was available; in fact, the care process depended upon individuals who had established relationships with the practice requesting weight-focused visits with their current primary care clinicians. This approach aimed to increase awareness of obesity care and reduce weight stigmatization. Having the PATHWEIGH care process in place increased the likelihood that adults with BMI $\geq$25 kg/m^2 received weight-related care (204), and PATHWEIGH is the first intervention to eliminate population-level weight gain (204). When possible, health systems and clinical practices should consider deploying a multicomponent care process strategy to support the evaluation and treatment of obesity.

Finally, adding a diagnosis of obesity may achieve multiple benefits. Research has found that a diagnosis of obesity in the medical record is associated with increased likelihood of treatment (38,284,285) and reported weight loss success (286,287). For example, an observational study of over 680,000 adults with BMI $\geq$30 kg/m^2 across 15 health systems found that diagnosis of obesity was significantly associated with achieving $\geq$5% weight loss approximately 12 months later (287). In addition, including a diagnosis of obesity when billing for services may improve the quality of health care claims data in identifying individuals with obesity. Studies have found that individuals who meet BMI criteria for obesity in the EHR often lack a diagnosis code for this disease (288–290). Employers, insurers, and government agencies rely upon claims data for profiling clinicians, adjusting payments, and assessing risk (291); critically, these groups may use claims data to inform and evaluate coverage decisions for obesity treatment, including obesity medications (292,293).

Health care professionals should add a diagnosis of overweight or obesity, as appropriate, to the medical record of adults who meet the diagnostic criteria (Table 3.1). It is recommended that nonstigmatizing diagnosis codes be used, which are outlined in the article "Weight Stigma and Bias: Standards of Care in Overweight and Obesity—2025" (17). When making the initial diagnosis, E66.8 "Other obesity" or E66.9 "Obesity, unspecified" may be used for any adult meeting the diagnostic criteria for obesity, and E66.3 "Overweight" may be used for any adult meeting the diagnostic criteria for overweight. Health

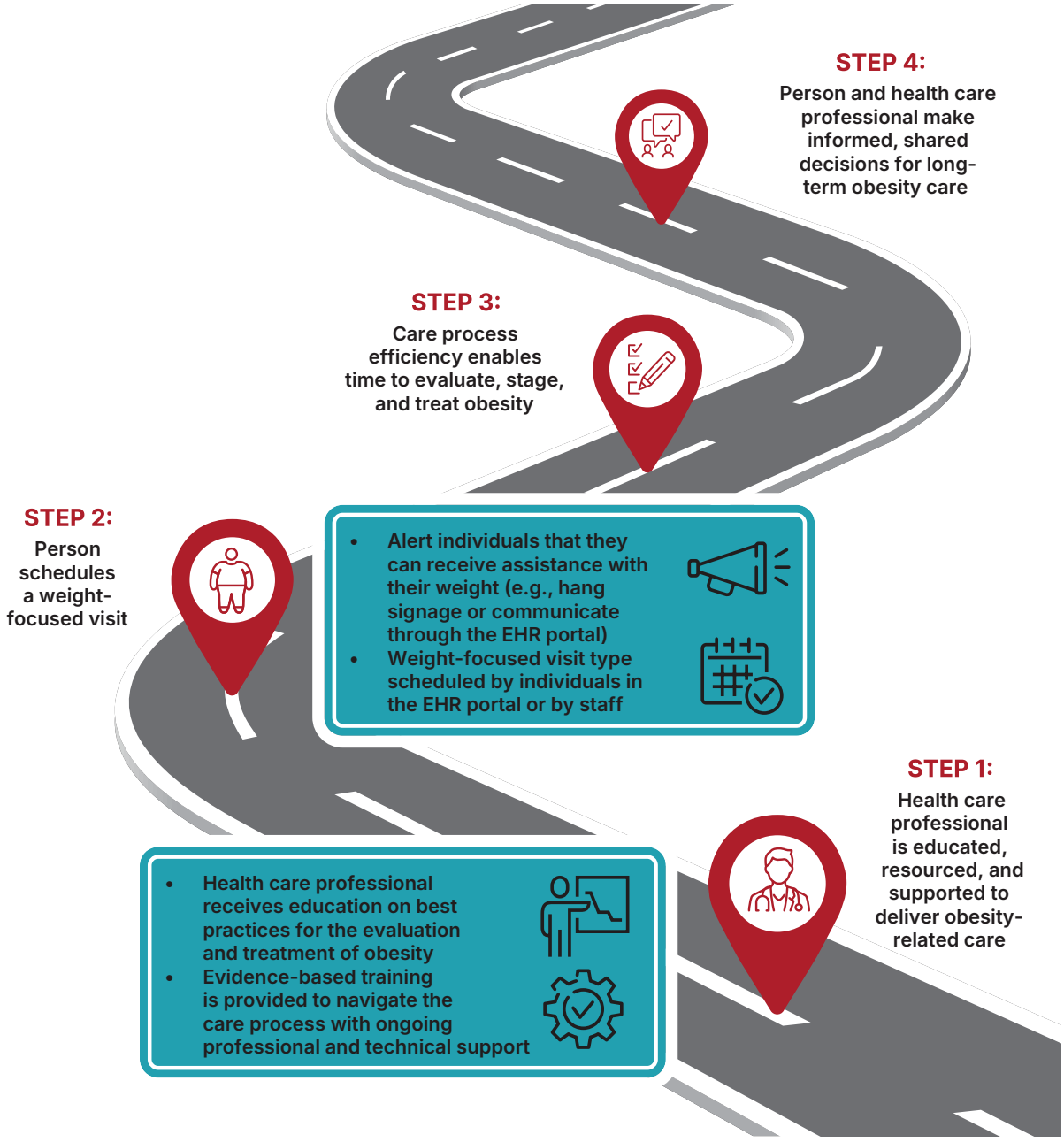

FIGURE 3.4 Evidence-based care process for the evaluation and treatment of obesity in ambulatory settings. EHR, electronic health record.

care professionals may alternatively use E66.811 (Obesity, class 1) for adults with BMI 30–34.9 kg/m^2, E66.812 (Obesity, class 2) for adults with BMI 35–39.9 kg/m^2, and E66.813 (Obesity, class 3) for adults with BMI ≥40 kg/m^2. Health care professionals should also include the appropriate Z-code to identify the individual's BMI at time of initial diagnosis (Z68) as well as diagnosis codes for any obesity-related diseases or complications (Table 3.5). This approach is needed because the current codes for obesity in ICD-10 do not capture the complexity of obesity within a single code, as is available for other chronic conditions, like type 2 diabetes (e.g., obesity with metabolic complications, obesity with cardiovascular complications). Conversely, ICD-10 codes are needed when obesity is "controlled" or in "weight maintenance." ICD-10 codes also do not reflect the recommendations made in this article for diagnosing obesity, which may cause uncertainty among health care professionals as well as billing and coding professionals on how to best use ICD-10 codes to identify obesity at this time. Given that obesity is a chronic disease, the diagnosis of obesity using an appropriate E66 code should remain over time, while the clinician can modify the BMI Z-code to reflect changes that may occur in response to obesity treatment. For example, an adult with BMI 35 kg/m^2 at initial diagnosis should receive diagnosis codes of E66.812 and Z68.35 (Obesity, class 2, and adult BMI 35.0–35.9,

respectively). If this individual engages in an obesity treatment plan that reduces their BMI to 28 kg/m^2, then diagnosis codes applied at follow-up care would be E66.812 and Z68.28 (Obesity, class 2, and adult BMI 28–28.9, respectively). This strategy reflects the general approach used in other chronic diseases: a diagnosis of type 2 diabetes remains in the medical record when A1C decreases with treatment, and a diagnosis of hypertension remains when blood pressure decreases with treatment. Health care professionals may need to engage their billing and coding staff to implement best practices that reflect application of the chronic disease model to obesity.

Conclusions

Stakeholders, including individuals with obesity, health care professionals, policymakers, insurers, and employers, recognize the importance of screening, diagnosis, evaluation, and staging of obesity. The Obesity Association of the ADA encourages clinicians and clinical practices to adopt and implement the present recommendations as part of comprehensive obesity care for adults. Health care professionals may use comprehensive clinical evaluation to inform risk assessments as well as tailor management strategies and treatment plans for each individual.

FUNDING

The "Standards of Care in Overweight and Obesity" guideline is funded by ADA general revenue. No other entity, including industry, provides financial support for the guideline. Committee members received no remuneration for their participation in development of this guideline. The funder has no role in the study design; in the collection, analysis and interpretation of the data; in the writing of the report; or in the decision to submit the paper for publication.

DUALITY OF INTEREST

All authors have completed the required disclosures in accordance with the guidelines of the ADA and its subdivision, the Obesity Association. Competing interests, where applicable, have been transparently disclosed and assessed by the ADA's duality of interest review panel. Authors with relevant conflicts of interest were excluded from discussions or decisions related to specific recommendations to maintain the integrity of the guideline development process. Full disclosure statements for all contributors are provided below.

K.A.G. is chief medical officer for ABOMF, received honoraria from the ADA, serves as an advisory board member for MedPage Today, and receives royalties from Johns Hopkins ACG System. L.P. served as a consultant and as part of speaker's bureaus for Novo Nordisk, Eli Lilly, and Boehringer Ingelheim. C.M.A. received research funding through their institution from GI Dynamics, Inc., and PCORI and direct research funding from the World Obesity Federation; served as a consultant for Covidien LP and Mediflex; served as an advisory board member or instructor/speaker at a continuing medical education event(s) sponsored by AbbVie, Altimmune, Arrowhead Pharmaceuticals, BioAge, Biolinq Incorporated, Caribou Biosciences, Cowen and Company, LLC, Currax Pharmaceuticals, LLC, Form Health, Fractyl Health, Keros Therapeutics, Lilly USA, LLC, L-Nutra, Neurocrine Biosciences, NodThera Limited, Nutrisystem, OptumRx, Pain Script Corporation, Palatin Technologies, Redesign Health, ReShape Lifesciences, Scholar Rock, Terns, Verily Life Sciences, Veru, Vida Health, Wave Life Sciences, WondrHealth, Xeno Biosciences, Zyversa Therapeutics, Aardvark Therapeutics, and Metsera; and is a senior volunteer for the World Obesity Federation. V.R.A. received research funding from Biomea, Boehringer Ingelheim, Recordati, Corcept, Eli Lilly, Fractyl, Novo Nordisk, Pfizer, and Servier, has served as a consultant for Sanofi, Roche, and Mediflex, serves as an associate editor for *Diabetes Care*, and reported that their spouse receives employee benefits from Aditum, Janssen, and Merck. L.J.A. received research funding from Eli Lilly, Novo Nordisk, Altimmune, and Skye Bioscience, served as a consultant and an advisory board member for Boehringer Ingelheim, Currax Pharmaceuticals, Eli Lilly, Altimmune, Janssen Pharmaceuticals, Skye Bioscience, Jazz Pharmaceuticals, Jamieson Wellness, Novo Nordisk, Pfizer, Veru Pharmaceuticals, Amgen, and Zealand Pharmaceuticals, and has equity interests in MBX Bioscience, Syntis, Veru Pharmaceuticals, Skye Bioscience, Jamieson Wellness, Flytehealth, Kallyope, and Mediflix. A.F. received research funding from Eli Lilly, Viking Therapeutics, and Roche/Genentech, received honoraria for travel, participated as part of speaker's bureaus, served as a member of an advisory board for Eli Lilly, Novo Nordisk, Viking Therapeutics, Amgen, Boehringer Ingelheim, Currax Pharmaceuticals, Rhythm, AbbVie, and Samsung Health, is an employee/partner/owner of a company providing goods or services to Eli Lilly, and is a senior volunteer for the Obesity Action Coalition and the Obesity Medicine Association. S.L.F. serves as an associate editor for *Diabetes Care*. W.T.G. received research funding from Novo Nordisk, Eli Lilly, Epitomee, Neurovalens, Zealand, Carmot/Roche, TERNS Pharmaceuticals, and Viking Therapeutics and served as an advisory board member for Boehringer Ingelheim, Eli Lilly, Novo Nordisk, Pfizer, Fractyl Health, Alnylam Pharmaceuticals, Zealand, Carmot/Roche, TERNS Pharmaceuticals, Neurocrine, Keros Therapeutics, Gan&Lee, Corcept, Metsera, AbbVie, and Regeneron. S.K. served as a consultant for Novo Nordisk, Lilly, Currax Pharmaceuticals, Vivus, and Boehringer Ingelheim. K.K. received research funding from AstraZeneca, Boehringer Ingelheim, Lilly, MSD, Novo Nordisk, Sanofi, Servier, Oramed Pharmaceuticals, Roche, Daiichi-Sankyo, and Applied Therapeutics and has served as consultant or received honoraria from Amgen, AstraZeneca, Bristol Myers Squibb, Boehringer Ingelheim, Lilly, Novo Nordisk, Sanofi, Servier, Pfizer, Roche, Daiichi-Sankyo, Embecta, and Nestle Health Science. R.F.K. has served as an advisory board member for Novo Nordisk, Boehringer Ingelheim, Weight Watchers, Eli Lilly, Antag, AstraZeneca, AbbVie, Structure, Currax Pharmaceuticals, Regeneron, and Altimmune. F.C.S. received research funding from Eli Lilly and served as a consultant and advisor for Novo Nordisk, Boehringer Ingelheim, Currax Pharmaceuticals, Amgen, AstraZeneca, Pfizer, Calibrate LifeForce, Vida Health, Ilant Health, Omada Health, Mellicell, Clearmind Medicine, and Apnimed. J.J.N. received honoraria for nonpromotional continuing education from Pharmacy Times, Postgraduate Healthcare Education, and Med Learning Group and for serving as the social media editor for *BMJ Diabetes Research and Care* and served as an advisory board member for the National Kidney Foundation. No other potential conflicts of interest relevant to this article were reported.

AUTHOR CONTRIBUTIONS

The development of these clinical guidelines involved contributions from all listed individuals of the Professional Practice Committee for Obesity (K.A.G., L.P., C.M.A., V.R.A., L.J.A., A.F., S.L.F., W.T.G., S.K., K.K., R.F.K., and F.C.S.) and listed American Diabetes Association staff (K.B., R.R.B., A.K.B., S.C., S.H., R.R.K., J.J.N., and E.J.P.) in the planning, conduct, and

reporting of the work. All committee members contributed to drafting and reviewing the manuscript, provided critical feedback, and contributed to planning of the manuscript, conduct, reporting, conception and design, acquisition of data or analysis, and interpretation of data. The American Diabetes Association Professional Practice Committee for Obesity collaboratively reviewed and approved the final guidelines. All contributors have provided their consent for inclusion in this statement.

Appendix

American Diabetes Association Professional Practice Committee for Obesity. Committee members include Kimberly A. Gudzune,[a,b] Leigh Perreault,[a] Caroline M. Apovian, Vanita R. Aroda, Louis J. Aronne, Angela Fitch, Stephanie L. Fitzpatrick, W. Timothy Garvey, Scott Kahan, Kamlesh Khunti, Robert F. Kushner, and Fatima Cody Stanford.

American Diabetes Association. American Diabetes Association staff include Kirthikaa Balapattabi, Raveendhara R. Bannuru,[c] Allison K. Bennett, Sathyavathi ChallaSivaKanaka,[c] Samar Hafida,[c] Rita R. Kalyani, Joshua J. Neumiller,[d] and Elizabeth J. Pekas.[c]

[a]Section leads

[b]American Diabetes Association Professional Practice Committee for Obesity Chair

[c]Former staff of the American Diabetes Association

[d]Former member of the American Diabetes Association Professional Practice Committee for Obesity

REFERENCES

1. Pucci A, Batterham RL. Endocrinology of the gut and the regulation of body weight and metabolism. In Endotext. Feingold KR, Adler RA, Ahmed SF, et al., Eds. South Dartmouth, MA, 2000

2. Srivastava G, Kushner RF, Apovian CM. Use of the historical weight trajectory to guide an obesity focused patient encounter. In Endotext. Feingold KR, Adler RA, Ahmed SF, et al., Eds. South Dartmouth, MA, 2000

3. Herbst KL. Subcutaneous adipose tissue diseases: dercum disease, lipedema, familial multiple lipomatosis, and madelung disease. In Endotext. Feingold KR, Adler RA, Ahmed SF, et al., Eds. South Dartmouth, MA, 2000

4. Farooqi IS. Genetic obesity syndromes. In Endotext. Feingold KR, Adler RA, Ahmed SF, et al., Eds. South Dartmouth, MA, 2000

5. Eknoyan G. Adolphe Quetelet (1796-1874)–the average man and indices of obesity. Nephrol Dial Transplant 2008;23:47–51

6. Keys A, Fidanza F, Karvonen MJ, Kimura N, Taylor HL. Indices of relative weight and obesity. J Chronic Dis 1972;25:329–343

7. Ford ES, Williamson DF, Liu S. Weight change and diabetes incidence: findings from a national cohort of US adults. Am J Epidemiol 1997;146:214–222

8. Dyer AR, Elliott P. The INTERSALT study: relations of body mass index to blood pressure. INTERSALT Co-operative Research Group. J Hum Hypertens 1989;3:299–308

9. Jayedi A, Rashidy-Pour A, Khorshidi M, Shab-Bidar S. Body mass index, abdominal adiposity, weight gain and risk of developing hypertension: a systematic review and dose-response meta-analysis of more than 2.3 million participants. Obes Rev 2018;19:654–667

10. Hubert HB, Feinleib M, McNamara PM, Castelli WP. Obesity as an independent risk factor for cardiovascular disease: a 26-year follow-up of participants in the Framingham Heart Study. Circulation 1983;67:968–977

11. Rimm EB, Stampfer MJ, Giovannucci E, et al. Body size and fat distribution as predictors of coronary heart disease among middle-aged and older US men. Am J Epidemiol 1995;141: 1117–1127

12. Rexrode KM, Hennekens CH, Willett WC, et al. A prospective study of body mass index, weight change, and risk of stroke in women. JAMA 1997;277:1539–1545

13. World Health Organization. Obesity: preventing and managing the global epidemic. Report of a WHO consultation. World Health Organ Tech Rep Ser 2000;894:1–253

14. McTigue KM, Hess R, Ziouras J. Obesity in older adults: a systematic review of the evidence for diagnosis and treatment. Obesity (Silver Spring) 2006;14:1485–1497

15. Rubino F, Cummings DE, Eckel RH, et al. Definition and diagnostic criteria of clinical obesity. Lancet Diabetes Endocrinol 2025;13:221–262

16. Bannuru RR; ADA Professional Practice Committee. Introduction and methodology: Standards of Care in Overweight and Obesity—2025. BMJ Open Diabetes Res Care 2025;13:e004928

17. Bannuru RR; ADA Professional Practice Committee. Weight stigma and bias: Standards of Care in Overweight and Obesity—2025. BMJ Open Diabetes Res Care 2025;13:e004962

18. Plourde G. Six As model of counseling in obesity. Can Fam Physician 2013;59:353

19. Jay M, Gillespie C, Schlair S, Sherman S, Kalet A. Physicians' use of the 5As in counseling obese patients: is the quality of counseling associated with patients' motivation and intention to lose weight? BMC Health Serv Res 2010;10:159

20. Alexander SC, Cox ME, Boling Turer CL, et al. Do the five A's work when physicians counsel about weight loss? Fam Med 2011;43:179–184

21. Jay MR, Gillespie CC, Schlair SL, et al. The impact of primary care resident physician training on patient weight loss at 12 months. Obesity (Silver Spring) 2013;21:45–50

22. Zheng Y, Manson JE, Yuan C, et al. Associations of weight gain from early to middle adulthood with major health outcomes later in life. JAMA 2017;318:255–269

23. Huang Z, Willett WC, Manson JE, et al. Body weight, weight change, and risk for hypertension in women. Ann Intern Med 1998;128:81–88

24. Colditz GA, Willett WC, Rotnitzky A, Manson JE. Weight gain as a risk factor for clinical diabetes mellitus in women. Ann Intern Med 1995;122:481–486

25. Willett WC, Manson JE, Stampfer MJ, et al. Weight, weight change, and coronary heart disease in women. Risk within the 'normal' weight range. JAMA 1995;273:461–465

26. Bjørge T, Häggström C, Ghaderi S, et al. BMI and weight changes and risk of obesity-related cancers: a pooled European cohort study. Int J Epidemiol 2019;48:1872–1885

27. Chen C, Ye Y, Zhang Y, Pan X-F, Pan A. Weight change across adulthood in relation to all cause and cause specific mortality: prospective cohort study. BMJ 2019;367:l5584

28. Malhotra R, Ostbye T, Riley CM, Finkelstein EA. Young adult weight trajectories through midlife by body mass category. Obesity (Silver Spring) 2013;21:1923–1934

29. Brown WJ, Flores TR, Keating SE, Mielke GI. Trajectories and determinants of weight gain in two cohorts of young adult women born 16 years apart. Int J Obes (Lond) 2021;45: 1553–1564

30. American Diabetes Association Professional Practice Committee for Obesity. Pharmacologic treatment of obesity in adults: Standards of Care in Overweight and Obesity. *Diabetes, Obesity, and CardioMetabolic CARE* 2026;1:5–36

31. Stanford FC, Cena H, Biino G, et al. The association between weight-promoting medication use and weight gain in postmenopausal women: findings from the Women's Health Initiative. Menopause 2020;27:1117–1125

32. Wilson JM, Jungner YG. Principles and practice of mass screening for disease. Bol Oficina Sanit Panam 1968;65: 281–393

33. Jensen MD, Ryan DH, Apovian CM, et al.; Obesity Society. 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society. Circulation 2014;129:S1021–S1038

34. Garvey WT, Mechanick JI, Brett EM, et al.; Reviewers of the AACE/ACE Obesity Clinical Practice Guidelines. American Association of Clinical Endocrinologists and American College of Endocrinology comprehensive clinical practice guidelines for medical care of patients with obesity. Endocr Pract 2016;22 (Suppl 3):1–203

35. LeBlanc ES, Patnode CD, Webber EM, Redmond N, Rushkin M, O'Connor EA. Behavioral and pharmacotherapy weight loss interventions to prevent obesity-related morbidity and mortality in adults: updated evidence report and systematic review for the US Preventive Services Task Force. JAMA 2018;320: 1172–1191

36. Nakao YM, Gale CP, Miyazaki K, et al. Impact of a national screening programme on obesity and cardiovascular risk factors. Eur J Prev Cardiol 2023;30:331–339

37. Post RE, Mainous AG, Gregorie SH, Knoll ME, Diaz VA, Saxena SK. The influence of physician acknowledgment of patients' weight status on patient perceptions of overweight and obesity in the United States. Arch Intern Med 2011;171: 316–321

38. Yaemsiri S, Slining MM, Agarwal SK. Perceived weight status, overweight diagnosis, and weight control among US adults: the NHANES 2003-2008 study. Int J Obes (Lond) 2011;35:1063–1070

39. Maukonen M, Männistö S, Tolonen H. A comparison of measured versus self-reported anthropometrics for assessing obesity in adults: a literature review. Scand J Public Health 2018;46:565–579

40. WHO Expert Consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet 2004;363:157–163

41. Caleyachetty R, Barber TM, Mohammed NI, et al. Ethnicity-specific BMI cutoffs for obesity based on type 2 diabetes risk in England: a population-based cohort study. Lancet Diabetes Endocrinol 2021;9:419–426

42. Kadowaki T, Sekikawa A, Murata K, et al. Japanese men have larger areas of visceral adipose tissue than Caucasian men in the same levels of waist circumference in a population-based study. Int J Obes (Lond) 2006;30:1163–1165

43. Gallagher D, Heymsfield SB, Heo M, Jebb SA, Murgatroyd PR, Sakamoto Y. Healthy percentage body fat ranges: an approach for developing guidelines based on body mass index. Am J Clin Nutr 2000;72:694–701

44. Romero-Corral A, Somers VK, Sierra-Johnson J, et al. Accuracy of body mass index in diagnosing obesity in the adult general population. Int J Obes (Lond) 2008;32:959–966

45. Post RE, Mendiratta M, Haggerty T, et al. Patient understanding of body mass index (BMI) in primary care practices: a two-state practice-based research (PBR) collaboration. J Am Board Fam Med 2015;28:475–480

46. Huq S, Todkar S, Lahiri SW. Patient perspectives on obesity management: need for greater discussion of BMI and weight-loss options beyond diet and exercise, especially in patients with diabetes. Endocr Pract 2020;26:471–483

47. Gregory CO, Blanck HM, Gillespie C, Maynard LM, Serdula MK. Health perceptions and demographic characteristics associated with underassessment of body weight. Obesity (Silver Spring) 2008;16:979–986

48. Patel N, Willis A, Stone M, et al. Developing a conceptually equivalent type 2 diabetes risk score for Indian Gujaratis in the UK. J Diabetes Res 2016;2016:8107108

49. Mahmoud I, Al-Wandi AS, Gharaibeh SS, Mohamed SA. Concordances and correlations between anthropometric indices of obesity: a systematic review. Public Health 2021; 198:301–306

50. Sommer I, Teufer B, Szelag M, et al. The performance of anthropometric tools to determine obesity: a systematic review and meta-analysis. Sci Rep 2020;10:12699

51. Okorodudu DO, Jumean MF, Montori VM, et al. Diagnostic performance of body mass index to identify obesity as defined by body adiposity: a systematic review and meta-analysis. Int J Obes (Lond) 2010;34:791–799

52. Pouliot MC, Després JP, Lemieux S, et al. Waist circumference and abdominal sagittal diameter: best simple anthropometric indexes of abdominal visceral adipose tissue accumulation and related cardiovascular risk in men and women. Am J Cardiol 1994;73:460–468

53. Cornier M-A, Després J-P, Davis N, et al.; American Heart Association Obesity Committee of the Council on Nutrition; Physical Activity and Metabolism; Council on Arteriosclerosis; Thrombosis and Vascular Biology; Council on Cardiovascular Disease in the Young; Council on Cardiovascular Radiology and Intervention; Council on Cardiovascular Nursing, Council on Epidemiology and Prevention; Council on the Kidney in Cardiovascular Disease; Stroke Council. Assessing adiposity: a scientific statement from the American Heart Association. Circulation 2011;124:1996–2019

54. Shah NR, Braverman ER. Measuring adiposity in patients: the utility of body mass index (BMI), percent body fat, and leptin. PLoS One 2012;7:e33308

55. Zheng W, McLerran DF, Rolland B, et al. Association between body-mass index and risk of death in more than 1 million Asians. N Engl J Med 2011;364:719–729

56. Wen CP, David Cheng TY, Tsai SP, et al. Are Asians at greater mortality risks for being overweight than Caucasians? Redefining obesity for Asians. Public Health Nutr 2009;12:497–506

57. Goh VHH, Tain CF, Tong TYY, Mok HPP, Wong MT. Are BMI and other anthropometric measures appropriate as indices for obesity? A study in an Asian population. J Lipid Res 2004;45: 1892–1898

58. Batsis JA, Mackenzie TA, Bartels SJ, Sahakyan KR, Somers VK, Lopez-Jimenez F. Diagnostic accuracy of body mass index

to identify obesity in older adults: NHANES 1999-2004. Int J Obes (Lond) 2016;40:761–767

59. Lee CMY, Huxley RR, Wildman RP, Woodward M. Indices of abdominal obesity are better discriminators of cardiovascular risk factors than BMI: a meta-analysis. J Clin Epidemiol 2008; 61:646–653

60. Browning LM, Hsieh SD, Ashwell M. A systematic review of waist-to-height ratio as a screening tool for the prediction of cardiovascular disease and diabetes: 0·5 could be a suitable global boundary value. Nutr Res Rev 2010;23:247–269

61. Ashwell M, Gunn P, Gibson S. Waist-to-height ratio is a better screening tool than waist circumference and BMI for adult cardiometabolic risk factors: systematic review and meta-analysis. Obes Rev 2012;13:275–286

62. Cerhan JR, Moore SC, Jacobs EJ, et al. A pooled analysis of waist circumference and mortality in 650,000 adults. Mayo Clin Proc 2014;89:335–345

63. Taylor AE, Ebrahim S, Ben-Shlomo Y, et al. Comparison of the associations of body mass index and measures of central adiposity and fat mass with coronary heart disease, diabetes, and all-cause mortality: a study using data from 4 UK cohorts. Am J Clin Nutr 2010;91:547–556

64. Corrêa MM, Thumé E, De Oliveira ERA, Tomasi E. Performance of the waist-to-height ratio in identifying obesity and predicting non-communicable diseases in the elderly population: a systematic literature review. Arch Gerontol Geriatr 2016;65:174–182

65. Ashwell M, Gibson S. Waist to height ratio is a simple and effective obesity screening tool for cardiovascular risk factors: analysis of data from the British National Diet and Nutrition Survey of adults aged 19-64 years. Obes Facts 2009;2:97–103

66. Dunkley AJ, Stone MA, Patel N, Davies MJ, Khunti K. Waist circumference measurement: knowledge, attitudes and barriers in patients and practitioners in a multi-ethnic population. Fam Pract 2009;26:365–371

67. Barber J, Palmese L, Chwastiak LA, et al. Reliability and practicality of measuring waist circumference to monitor cardiovascular risk among community mental health center patients. Community Ment Health J 2014;50:68–74

68. Shi W, Neubeck L, Gallagher R. Measurement matters: a systematic review of waist measurement sites for determining central adiposity. Collegian 2017;24:513–523

69. Ross R, Berentzen T, Bradshaw AJ, et al. Does the relationship between waist circumference, morbidity and mortality depend on measurement protocol for waist circumference? Obes Rev 2008; 9:312–325

70. Mastrocola MR, Roque SS, Benning LV, Stanford FC. Obesity education in medical schools, residencies, and fellowships throughout the world: a systematic review. Int J Obes (Lond) 2020;44:269–279

71. Wethington E. An overview of the life course perspective: implications for health and nutrition. J Nutr Educ Behav 2005; 37:115–120

72. Latner JD, Ciao AC. Weight-loss history as a predictor of obesity treatment outcome: prospective, long-term results from behavioral, group self-help treatment. J Health Psychol 2014; 19:253–261

73. Teixeira PJ, Palmeira AL, Branco TL, et al. Who will lose weight? A reexamination of predictors of weight loss in women. Int J Behav Nutr Phys Act 2004;1:12

74. Burgess E, Hassmén P, Pumpa KL. Determinants of adherence to lifestyle intervention in adults with obesity: a systematic review. Clin Obes 2017;7:123–135

75. Fitzpatrick SL, Wischenka D, Appelhans BM, et al.; Society of Behavioral Medicine. An evidence-based guide for obesity treatment in primary care. Am J Med 2016;129:115.e1–e7

76. Gudzune KA, Brittan DR, Cadle AW, Reid TJ, Wickham EP, Korner J. Duties, tasks, knowledge and skills of an obesity medicine physician: a practice analysis. Obes Pillars 2024;12:100147

77. Gudzune KA, Wickham EP, Schmidt SL, Stanford FC. Physicians certified by the American Board of Obesity Medicine provide evidence-based care. Clin Obes 2021;11:e12407

78. Brown KL, Cready G, Schmiedicker K, et al. Reimagining primary care visits for people living with obesity: a co-design and validation study. Patient Educ Couns 2025;138:109190

79. Bloom B, Mehta AK, Clark JM, Gudzune KA. Guideline-concordant weight-loss programs in an urban area are uncommon and difficult to identify through the internet. Obesity (Silver Spring) 2016;24:583–588

80. Kushner RF, Batsis JA, Butsch WS, et al. Weight history in clinical practice: the state of the science and future directions. Obesity (Silver Spring) 2020;28:9–17

81. Pollak KI, Østbye T, Alexander SC, et al. Empathy goes a long way in weight loss discussions. J Fam Pract 2007;56:1031–1036

82. Pollak KI, Alexander SC, Tulsky JA, et al. Physician empathy and listening: associations with patient satisfaction and autonomy. J Am Board Fam Med 2011;24:665–672

83. Hojat M, Louis DZ, Markham FW, Wender R, Rabinowitz C, Gonnella JS. Physicians' empathy and clinical outcomes for diabetic patients. Acad Med 2011;86:359–364

84. Licciardone JC, Tran Y, Ngo K, Toledo D, Peddireddy N, Aryal S. Physician empathy and chronic pain outcomes. JAMA Netw Open 2024;7:e246026

85. Yu E, Ley SH, Manson JE, et al. Weight history and all-cause and cause-specific mortality in three prospective cohort studies. Ann Intern Med 2017;166:613–620

86. Xu H, Cupples LA, Stokes A, Liu C-T. Association of obesity with mortality over 24 years of weight history: findings from the Framingham Heart Study. JAMA Netw Open 2018;1:e184587

87. Ward ZJ, Long MW, Resch SC, Giles CM, Cradock AL, Gortmaker SL. Simulation of growth trajectories of childhood obesity into adulthood. N Engl J Med 2017;377:2145–2153

88. Liu M, Zhang Z, Zhou C, et al. Relationship of weight change patterns from young to middle adulthood with incident cardiovascular diseases. J Clin Endocrinol Metab 2021;106: e812–e823

89. Mongraw-Chaffin ML, Peters SAE, Huxley RR, Woodward M. The sex-specific association between BMI and coronary heart disease: a systematic review and meta-analysis of 95 cohorts with 1·2 million participants. Lancet Diabetes Endocrinol 2015;3:437–449

90. Yacamán-Méndez D, Trolle-Lagerros Y, Zhou M, et al. Life-course trajectories of weight and their impact on the incidence of type 2 diabetes. Sci Rep 2021;11:12494

91. Kim MN, Lo C-H, Corey KE, et al. Weight gain during early adulthood, trajectory of body shape and the risk of nonalcoholic fatty liver disease: a prospective cohort study among women. Metabolism 2020;113:154398

92. VanWagner LB, Khan SS, Ning H, et al. Body mass index trajectories in young adulthood predict non-alcoholic fatty liver

disease in middle age: the CARDIA cohort study. Liver Int 2018; 38:706–714

93. Petrick JL, Kelly SP, Liao LM, Freedman ND, Graubard BI, Cook MB. Body weight trajectories and risk of oesophageal and gastric cardia adenocarcinomas: a pooled analysis of NIH-AARP and PLCO Studies. Br J Cancer 2017;116:951–959

94. Berrington de Gonzalez A, Hartge P, Cerhan JR, et al. Body-mass index and mortality among 1.46 million white adults. N Engl J Med 2010;363:2211–2219

95. Norris T, Cole TJ, Bann D, et al. Duration of obesity exposure between ages 10 and 40 years and its relationship with cardiometabolic disease risk factors: a cohort study. PLoS Med 2020;17:e1003387

96. Kelly AS, Barlow SE, Rao G, et al.; American Heart Association Atherosclerosis, Hypertension, and Obesity in the Young Committee of the Council on Cardiovascular Disease in the Young, Council on Nutrition, Physical Activity and Metabolism, and Council on Clinical Cardiology. Severe obesity in children and adolescents: identification, associated health risks, and treatment approaches: a scientific statement from the American Heart Association. Circulation 2013;128:1689–1712

97. Rasooly D, Moonesinghe R, Littrell K, Hull L, Khoury MJ. Association between a first-degree family history and self-reported personal history of obesity, diabetes, and heart and blood conditions: results from the All of Us Research Program. J Am Heart Assoc 2023;12:e030779

98. Bouchard C. Childhood obesity: are genetic differences involved? Am J Clin Nutr 2009;89:1494s–1501s

99. Khera AV, Chaffin M, Wade KH, et al. Polygenic prediction of weight and obesity trajectories from birth to adulthood. Cell 2019;177:587–596.e9

100. Kim MS, Shim I, Fahed AC, et al. Association of genetic risk, lifestyle, and their interaction with obesity and obesity-related morbidities. Cell Metab 2024;36:1494–1503.e3

101. Kruppa P, Crescenzi R, Faerber G, et al. Lipedema World Alliance Delphi consensus-based position paper on the definition and management of lipedema: results from the 2023 Lipedema World Congress in Potsdam. Nat Commun 2026;17:427

102. Nadolsky K, Addison B, Agarwal M, et al. American Association of Clinical Endocrinology consensus statement: addressing stigma and bias in the diagnosis and management of patients with obesity/adiposity-based chronic disease and assessing bias and stigmatization as determinants of disease severity. Endocr Pract 2023;29:417–427

103. Durso LE, Latner JD. Understanding self-directed stigma: development of the weight bias internalization scale. Obesity (Silver Spring) 2008;16(Suppl. 2):S80–S86

104. Lillis J, Luoma JB, Levin ME, Hayes SC. Measuring weight self-stigma: the weight self-stigma questionnaire. Obesity (Silver Spring) 2010;18:971–976

105. Pearl RL, Puhl RM. Weight bias internalization and health: a systematic review. Obes Rev 2018;19:1141–1163

106. Almazan E, Schwartz JL, Gudzune KA. Use of medications associated with weight change among participants in the All of Us research programme. Clin Obes 2023;13:e12609

107. Moon RC, Almuwaqqat Z. Effect of obesogenic medication on weight- and fitness-change outcomes: evidence from the Look AHEAD study. Obesity (Silver Spring) 2020;28:2003–2009

108. Pearson ES. Goal setting as a health behavior change strategy in overweight and obese adults: a systematic literature review examining intervention components. Patient Educ Couns 2012;87:32–42

109. Wren GM, Koutoukidis DA, Scragg J, Whitman M, Jebb S. The association between goal setting and weight loss: prospective analysis of a community weight loss program. J Med Internet Res 2023;25:e43869

110. Wee CC, Davis RB, Phillips RS. Stage of readiness to control weight and adopt weight control behaviors in primary care. J Gen Intern Med 2005;20:410–415

111. Ghannadiasl F, Mahdavi R, AsghariJafarabadi M. Assessing readiness to lose weight among obese women attending the nutrition clinic. Health Promot Perspect 2014;4:27–34

112. Ceccarini M, Borrello M, Pietrabissa G, Manzoni GM, Castelnuovo G. Assessing motivation and readiness to change for weight management and control: an in-depth evaluation of three sets of instruments. Front Psychol 2015;6:511

113. Barnes RD, Ivezaj V. A systematic review of motivational interviewing for weight loss among adults in primary care. Obes Rev 2015;16:304–318

114. Vallis M, Piccinini-Vallis H, Sharma AM, Freedhoff Y. Clinical review: modified 5 As: minimal intervention for obesity counseling in primary care. Can Fam Physician 2013;59:27–31

115. Vernarelli JA, Kiel JR, Coleman CD, Jonnalagadda SS. Health behaviors predicting risk of obesity in US adults: what does a healthy lifestyle look like? Obes Sci Pract 2024;10:e781

116. Trivedi T, Liu J, Probst J, Merchant A, Jones S, Martin AB. Obesity and obesity-related behaviors among rural and urban adults in the USA. Remote Rural Health 2015;15:3267

117. Johnston CS, Bliss C, Knurick JR, Scholtz C. Rapid Eating Assessment for Participants [shortened version] scores are associated with Healthy Eating Index-2010 scores and other indices of diet quality in healthy adult omnivores and vegetarians. Nutr J 2018;17:89

118. Segal-Isaacson CJ, Wylie-Rosett J, Gans KM. Validation of a short dietary assessment questionnaire: the Rapid Eating and Activity Assessment for Participants short version (REAP-S). Diabetes Educ 2004;30:774, 776, 778 passim

119. Kuntz JL, Young DR, Saelens BE, et al. Validity of the exercise vital sign tool to assess physical activity. Am J Prev Med 2021;60:866–872

120. Lin CY, Gentile NL, Bale L, et al. Implementation of a physical activity vital sign in primary care: associations between physical activity, demographic characteristics, and chronic disease burden. Prev Chronic Dis 2022;19:E33

121. Block JP, He Y, Zaslavsky AM, Ding L, Ayanian JZ. Psychosocial stress and change in weight among US adults. Am J Epidemiol 2009;170:181–192

122. Kumar R, Rizvi MR, Saraswat S. Obesity and stress: a contingent paralysis. Int J Prev Med 2022;13:95

123. Valderhaug TG, Slavich GM. Assessing life stress: a critical priority in obesity research and treatment. Obesity (Silver Spring) 2020;28:1571–1573

124. Tomiyama AJ. Stress and obesity. Annu Rev Psychol 2019; 70:703–718

125. Gangwisch JE, Malaspina D, Boden-Albala B, Heymsfield SB. Inadequate sleep as a risk factor for obesity: analyses of the NHANES I. Sleep 2005;28:1289–1296

126. Vgontzas AN, Lin H-M, Papaliaga M, et al. Short sleep duration and obesity: the role of emotional stress and sleep disturbances. Int J Obes (Lond) 2008;32:801–809

127. Vorona RD, Winn MP, Babineau TW, Eng BP, Feldman HR, Ware JC. Overweight and obese patients in a primary care population report less sleep than patients with a normal body mass index. Arch Intern Med 2005;165:25–30

128. Thomson CA, Morrow KL, Flatt SW, et al. Relationship between sleep quality and quantity and weight loss in women participating in a weight-loss intervention trial. Obesity (Silver Spring) 2012;20:1419–1425

129. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res 1989;28: 193–213

130. Bramante CT, Lee G, Amsili SS, et al. Minority and low-income patients are less likely to have a scale for self-weighing in their home: a survey in primary care. Clin Obes 2020;10:e12363

131. Pujia C, Ferro Y, Mazza E, Maurotti S, Montalcini T, Pujia A. The role of mobile apps in obesity management: systematic review and meta-analysis. J Med Internet Res 2025;27:e66887

132. Jannah N, Hild J, Gallagher C, Dietz W. Coverage for obesity prevention and treatment services: analysis of Medicaid and state employee health insurance programs. Obesity (Silver Spring) 2018;26:1834–1840

133. Lee JS, Sheer JLO, Lopez N, Rosenbaum S. Coverage of obesity treatment: a state-by-state analysis of Medicaid and state insurance laws. Public Health Rep 2010;125:596–604

134. Washington TB, Johnson VR, Kendrick K, et al. Disparities in access and quality of obesity care. Gastroenterol Clin North Am 2023;52:429–441

135. Eberly LA, Yang L, Essien UR, et al. Racial, ethnic, and socioeconomic inequities in glucagon-like peptide-1 receptor agonist use among patients with diabetes in the US. JAMA Health Forum 2021;2:e214182

136. Ostrominski JW, Chhibber A, Kuti EL, Clark B, Donato BMK. Obesity medication treatment perspectives among people with overweight or obesity. Patient Prefer Adherence 2025;19: 2887–2899

137. Kaplan LM, Golden A, Jinnett K, et al. Perceptions of barriers to effective obesity care: results from the national ACTION study. Obesity (Silver Spring) 2018;26:61–69

138. Wang ML, Pbert L, Lemon SC. Influence of family, friend and coworker social support and social undermining on weight gain prevention among adults. Obesity (Silver Spring) 2014;22: 1973–1980

139. Leahey TM, Doyle CY, Xu X, Bihuniak J, Wing RR. Social networks and social norms are associated with obesity treatment outcomes. Obesity (Silver Spring) 2015;23:1550–1554

140. Wing RR, Jeffery RW. Benefits of recruiting participants with friends and increasing social support for weight loss and maintenance. J Consult Clin Psychol 1999;67:132–138

141. Jensen MT, Nielsen SS, Jessen-Winge C, et al. The effectiveness of social-support-based weight-loss interventions-a systematic review and meta-analysis. Int J Obes (Lond) 2024;48:599–611

142. Casagrande SS, Whitt-Glover MC, Lancaster KJ, Odoms-Young AM, Gary TL. Built environment and health behaviors among African Americans: a systematic review. Am J Prev Med 2009;36:174–181

143. Pineda E, Stockton J, Scholes S, Lassale C, Mindell JS. Food environment and obesity: a systematic review and meta-analysis. BMJ Nutr Prev Health 2024;7:204–211

144. Christakis NA, Fowler JH. The spread of obesity in a large social network over 32 years. N Engl J Med 2007;357:370–379

145. Alidu L, Grunfeld EA. A systematic review of acculturation, obesity and health behaviours among migrants to high-income countries. Psychol Health 2018;33:724–745

146. Pickett S, Peters RM. Beliefs about personal weight among African American women. Clin Nurs Res 2017;26:191–204

147. Rezaei M, Ghadamgahi F, Jayedi A, Arzhang P, Yekaninejad MS, Azadbakht L. The association between food insecurity and obesity, a body shape index and body roundness index among US adults. Sci Rep 2024;14:23631

148. Kowaleski-Jones L, Wen M, Fan JX. Unpacking the paradox: testing for mechanisms in the food insecurity and BMI association. J Hunger Environ Nutr 2019;14:683–697

149. Clennin M, Reifler L, Goodman O, et al. Association of housing instability with obesity status among insured adults. Am J Prev Med 2024;67:417–422

150. Ogden CL, Fakhouri TH, Carroll MD, et al. Prevalence of obesity among adults, by household income and education—United States, 2011-2014. MMWR Morb Mortal Wkly Rep 2017;66:1369–1373

151. Hales CM, Fryar CD, Carroll MD, Freedman DS, Aoki Y, Ogden CL. Differences in obesity prevalence by demographic characteristics and urbanization level among adults in the United States, 2013-2016. JAMA 2018;319:2419–2429

152. Ashe KM, Lapane KL. Food insecurity and obesity: exploring the role of social support. J Womens Health (Larchmt) 2018;27: 651–658

153. Buszkiewicz JH, Bobb JF, Kapos F, et al. Differential associations of the built environment on weight gain by sex and race/ethnicity but not age. Int J Obes (Lond) 2021;45:2648–2656

154. Jalilzadeh M, Goharinezhad S. Exploring the multifaceted factors influencing overweight and obesity: a scoping review. Front Public Health 2025;13:1540756

155. Mylona EK, Benitez G, Shehadeh F, et al. The association of obesity with health insurance coverage and demographic characteristics: a statewide cross-sectional study. Medicine (Baltimore) 2020;99:e21016

156. Henrikson NB, Blasi PR, Dorsey CN, et al. Psychometric and pragmatic properties of social risk screening tools: a systematic review. Am J Prev Med 2019;57:S13–S24

157. Saulsberry L, Gunter KE, O'Neal Y, et al. "Everything in One Place": stakeholder perceptions of integrated medical and social care for diabetes patients in western Maryland. J Gen Intern Med 2023;38:25–32

158. Gunter KE, Peek ME, Tanumihardjo JP, et al. Population health innovations and payment to address social needs among patients and communities with diabetes. Milbank Q 2021;99: 928–973

159. Fitzpatrick SL, Papajorgji-Taylor D, Schneider JL, et al. Bridge to Health/Puente a la Salud: a pilot randomized trial to address diabetes self-management and social needs among high-risk patients. Transl Behav Med 2022;12:783–792

160. Mundi MS, Hurt RT, Phelan SM, et al. Associations between experience of early childhood trauma and impact on obesity status, health, as well as perceptions of obesity-related health care. Mayo Clin Proc 2021;96:408–419

161. Palmisano GL, Innamorati M, Vanderlinden J. Life adverse experiences in relation with obesity and binge eating disorder: a systematic review. J Behav Addict 2016;5:11–31

162. Diallo A, Minier N, Bonnet J-B, et al. Traumatic life events, violence, and obesity: a cross-sectional study from 408 patients enrolled in a bariatric surgery program. Obes Facts 2024;17:237–242

163. Sarwer DB, Schroeder K, Fischbach SR, Atwood SM, Heinberg LJ. Applying the principles of trauma-informed care to the evaluation and management of patients who undergo metabolic and bariatric surgery. Obes Surg 2025;35:305–311

164. Williams DR, Chaves E, Karp SM, Browne NT. Clinical review: implementation of trauma informed care to optimally impact the treatment of childhood obesity. Obes Pillars 2023; 5:100052

165. Grossman S, Cooper Z, Buxton H, et al. Trauma-informed care: recognizing and resisting re-traumatization in health care. Trauma Surg Acute Care Open 2021;6:e000815

166. Yuen MMA. Health complications of obesity: 224 obesity-associated comorbidities from a mechanistic perspective. Gastroenterol Clin North Am 2023;52:363–380

167. Lu Q, Bao Y, Lu F, et al. Exploring population and sex-specific disease trajectories for multimorbidities among individuals with overweight or obesity: a retrospective cohort study in UK biobank. Diabetes Obes Metab 2025;27:5235–5246

168. Khunti K, Sathanapally H, Mountain P. Multiple long term conditions, multimorbidity, and co-morbidities: we should reconsider the terminology we use. BMJ 2023;383:2327

169. Khunti K, Mourer A, Capucci S, et al. Change in body mass index and disease burden among people with obesity and multiple long-term conditions. Diabetes Obes Metab 2026;28: 2722–2734

170. Shan J, Yin R, Panuthai S. Body mass index and multimorbidity risk: a systematic review and dose-response meta-analysis. Arch Gerontol Geriatr 2024;123:105418

171. Sarwer DB, Polonsky HM. The Psychosocial Burden of Obesity. Endocrinol Metab Clin North Am 2016;45:677–688

172. Carpenter KM, Hasin DS, Allison DB, Faith MS. Relationships between obesity and DSM-IV major depressive disorder, suicide ideation, and suicide attempts: results from a general population study. Am J Public Health 2000;90:251–257

173. Onyike CU, Crum RM, Lee HB, Lyketsos CG, Eaton WW. Is obesity associated with major depression? Results from the Third National Health and Nutrition Examination Survey. Am J Epidemiol 2003;158:1139–1147

174. Cifuentes L, Campos A, Silgado MLR, et al. Association between anxiety and eating behaviors in patients with obesity. Obes Pillars 2022;3:100021

175. Liu Y, Liang R, Lin Y, Xu B. The significance of assessing the weight-adjusted-waist index (WWI) in patients with depression: a systematic review and meta-analysis. J Affect Disord 2025;386:119479

176. Fulton S, Décarie-Spain L, Fioramonti X, Guiard B, Nakajima S. The menace of obesity to depression and anxiety prevalence. Trends Endocrinol Metab 2022;33:18–35

177. Steptoe A, Frank P. Obesity and psychological distress. Philos Trans R Soc Lond B Biol Sci 2023;378:20220225

178. Weiss F, Barbuti M, Carignani G, et al. Psychiatric aspects of obesity: a narrative review of pathophysiology and psychopathology. J Clin Med 2020;9:2344

179. Luppino FS, de Wit LM, Bouvy PF, et al. Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies. Arch Gen Psychiatry 2010;67:220–229

180. Rindler GA, Gries A, Freidl W. Associations between overweight, obesity, and mental health: a retrospective study among European adults aged 50. Front Public Health 2023;11: 1206283

181. American Diabetes Association Professional Practice Committee. 2. Diagnosis and classification of diabetes: Standards of Care in Diabetes—2026. Diabetes Care 2026;49 (Suppl. 1):S27–S49

182. Grundy SM, Stone NJ, Bailey AL, et al. 2018 AHA/ACC/ AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA guideline on the management of blood cholesterol: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Circulation 2019; 139:e1082–e1143

183. American Diabetes Association Professional Practice Committee. 4. Comprehensive medical evaluation and assessment of comorbidities: Standards of Care in Diabetes—2026. Diabetes Care 2026;49(Suppl. 1):S61–S88

184. Shah RV, Murthy VL, Abbasi SA, et al. Visceral adiposity and the risk of metabolic syndrome across body mass index: the MESA Study. JACC Cardiovasc Imaging 2014;7:1221–1235

185. Jayedi A, Soltani S, Motlagh SZ-T, et al. Anthropometric and adiposity indicators and risk of type 2 diabetes: systematic review and dose-response meta-analysis of cohort studies. BMJ 2022;376:e067516

186. Pang Q, Zhang J-Y, Song S-D, et al. Central obesity and nonalcoholic fatty liver disease risk after adjusting for body mass index. World J Gastroenterol 2015;21:1650–1662

187. Zhou W, Shi Y, Li Y-Q, et al. Body mass index, abdominal fatness, and hypertension incidence: a dose-response meta-analysis of prospective studies. J Hum Hypertens 2018;32: 321–333

188. Ballin M, Nordström P, Niklasson J, Nordström A. Associations of visceral adipose tissue and skeletal muscle density with incident stroke, myocardial infarction, and all-cause mortality in community-dwelling 70-year-old individuals: a prospective cohort study. J Am Heart Assoc 2021;10:e020065

189. Aune D, Sen A, Norat T, et al. Body mass index, abdominal fatness, and heart failure incidence and mortality: a systematic review and dose-response meta-analysis of prospective studies. Circulation 2016;133:639–649

190. Shen F, Guo C, Zhang D, Liu Y, Zhang P. Visceral adiposity index as a predictor of type 2 diabetes mellitus risk: a systematic review and dose-response meta-analysis. Nutr Metab Cardiovasc Dis 2024;34:811–822

191. Wang L, Ding H, Deng Y, Huang J, Lao X, Wong MCS. Associations of obesity indices change with cardiovascular outcomes: a dose-response meta-analysis. Int J Obes (Lond) 2024;48:635–645

192. Ortiz GU, Lopes da Silva LS, da Silva Gonçalves L, et al. The association between body mass index, waist circumference and waist-to-hip-ratio with all-cause mortality in older adults: a systematic review. Clin Nutr ESPEN 2025;67:493–509

193. Keum N, Lee DH, Kim R, Greenwood DC, Giovannucci EL. Visceral adiposity and colorectal adenomas: dose-response meta-analysis of observational studies. Ann Oncol 2015;26: 1101–1109

194. Parasuaraman G, Ayyasamy L, Aune D, et al. The association between body mass index, abdominal fatness, and weight change and the risk of adult asthma: a systematic review and meta-analysis of cohort studies. Sci Rep 2023;13:7745

195. Aune D, Norat T, Vatten LJ. Body mass index, abdominal fatness and the risk of gallbladder disease. Eur J Epidemiol 2015;30:1009–1019

196. De Ridder J, Julián-Almárcegui C, Mullee A, et al. Comparison of anthropometric measurements of adiposity in relation to cancer risk: a systematic review of prospective studies. Cancer Causes Control 2016;27:291–300

197. Ahn J, Simpkins C, Yang F. Adipose tissue deposition region affects fall risk in people with obesity: a systematic review and meta-analysis. Obes Res Clin Pract 2024;18:1–8

198. Garvey WT, Garber AJ, Mechanick JI, et al.; The Aace Obesity Scientific Committee. American Association of Clinical Endocrinologists and American College of Endocrinology position statement on the 2014 advanced framework for a new diagnosis of obesity as a chronic disease. Endocr Pract 2014; 20:977–989

199. Guo F, Moellering DR, Garvey WT. The progression of cardiometabolic disease: validation of a new cardiometabolic disease staging system applicable to obesity. Obesity (Silver Spring) 2014;22:110–118

200. Ndumele CE, Rangaswami J, Chow SL, et al.; American Heart Association. Cardiovascular-kidney-metabolic health: a presidential advisory from the American Heart Association. Circulation 2023;148:1606–1635

201. Padwal RS, Pajewski NM, Allison DB, Sharma AM. Using the Edmonton Obesity Staging System to predict mortality in a population-representative cohort of people with overweight and obesity. CMAJ 2011;183:E1059–E1066

202. Kuk JL, Ardern CI, Church TS, et al. Edmonton Obesity Staging System: association with weight history and mortality risk. Appl Physiol Nutr Metab 2011;36:570–576

203. Bioletto F, Ponzo V, Goitre I, et al. Complementary role of BMI and EOSS in predicting all-cause and cause-specific mortality in people with overweight and obesity. Nutrients 2024;16:3433

204. Perreault L, Pan Q, Rodriguez C, et al. Implementation and effectiveness of a care process to prioritize weight management in primary care: a stepped-wedge cluster-randomized trial. Nat Med 2026;32:645–652

205. Sharma AM, Kushner RF. A proposed clinical staging system for obesity. Int J Obes (Lond) 2009;33:289–295

206. Samdal GB, Eide GE, Barth T, Williams G, Meland E. Effective behaviour change techniques for physical activity and healthy eating in overweight and obese adults; systematic review and meta-regression analyses. Int J Behav Nutr Phys Act 2017;14:42

207. Pollak KI, Alexander SC, Coffman CJ, et al. Physician communication techniques and weight loss in adults: project CHAT. Am J Prev Med 2010;39:321–328

208. Shilts MK, Horowitz M, Townsend MS. Goal setting as a strategy for dietary and physical activity behavior change: a review of the literature. Am J Health Promot 2004;19:81–93

209. Avery A, Langley-Evans SC, Harrington M, Swift JA. Setting targets leads to greater long-term weight losses and "unrealistic" targets increase the effect in a large community-based commercial weight management group. J Hum Nutr Diet 2016;29:687–696

210. Weintraub MA, D'Angelo D, Tchang BG, et al. Five-year weight loss maintenance with obesity pharmacotherapy. J Clin Endocrinol Metab 2023;108:e832–e841

211. Chen J, Kaur H, Jaques J, et al. Association of clinically significant weight loss with number of patient visits and months of attendance at an Australian multidisciplinary weight management clinic. Clin Obes 2022;12:e12520

212. Gudzune KA, Doshi RS, Mehta AK, et al. Efficacy of commercial weight-loss programs: an updated systematic review. Ann Intern Med 2015;162:501–512

213. Laudenslager M, Chaudhry ZW, Rajagopal S, Clynes S, Gudzune KA. Commercial weight loss programs in the management of obesity: an update. Curr Obes Rep 2021;10:90–99

214. Wing RR, Hamman RF, Bray GA, et al. Achieving weight and activity goals among diabetes prevention program lifestyle participants. Obes Res 2004;12:1426–1434

215. Wadden TA, West DS, Neiberg RH, et al.; Look AHEAD Research Group. One-year weight losses in the Look AHEAD study: factors associated with success. Obesity (Silver Spring) 2009;17:713–722

216. Alabduljabbar K, Alsaqaaby M, Neff KJ, Crotty M, Le Roux CW. Weight loss response in patients with obesity treated with injectable semaglutide in a real-world setting. Endocrine 2024; 83:392–398

217. Griebeler ML, Butsch WS, Rodriguez P, et al. The use of virtual visits for obesity pharmacotherapy in patients with overweight or obesity compared with in-person encounters. Obesity (Silver Spring) 2022;30:2194–2203

218. Appel LJ, Clark JM, Yeh H-C, et al. Comparative effectiveness of weight-loss interventions in clinical practice. N Engl J Med 2011;365:1959–1968

219. Yücel ÜÖ, Yücel M. The effect of phone and video counselling given to participants living with obesity on weight loss and quality of life during the COVID-19 pandemic: a randomised controlled trial. J Hum Nutr Diet 2023;36:1417–1424

220. Ely EK, Gruss SM, Luman ET, et al. A national effort to prevent type 2 diabetes: participant-level evaluation of CDC's National Diabetes Prevention Program. Diabetes Care 2017;40: 1331–1341

221. Jastreboff AM, Aronne LJ, Ahmad NN, et al.; SURMOUNT-1 Investigators. Tirzepatide once weekly for the treatment of obesity. N Engl J Med 2022;387:205–216

222. Garvey WT, Frias JP, Jastreboff AM, et al. Tirzepatide once weekly for the treatment of obesity in people with type 2 diabetes (SURMOUNT-2): a double-blind, randomised, multicentre, placebo-controlled, phase 3 trial. Lancet 2023;402:613–626

223. Wilding JPH, Batterham RL, Calanna S, et al.; STEP 1 Study Group. Once-weekly semaglutide in adults with overweight or obesity. N Engl J Med 2021;384:989–1002

224. Davies M, Færch L, Jeppesen OK, et al.; STEP 2 Study Group. Semaglutide 2·4 mg once a week in adults with overweight or obesity, and type 2 diabetes (STEP 2): a randomised, double-blind, double-dummy, placebo-controlled, phase 3 trial. Lancet 2021;397:971–984

225. Davies MJ, Bergenstal R, Bode B, et al.; NN8022-1922 Study Group. Efficacy of liraglutide for weight loss among patients with type 2 diabetes: the SCALE diabetes randomized clinical trial. JAMA 2015;314:687–699

226. Pi-Sunyer X, Astrup A, Fujioka K, et al.; SCALE Obesity and Prediabetes NN8022-1839 Study Group. A randomized, controlled trial of 3.0 mg of liraglutide in weight management. N Engl J Med 2015;373:11–22

227. Hollander PA, Elbein SC, Hirsch IB, et al. Role of orlistat in the treatment of obese patients with type 2 diabetes. A 1-year randomized double-blind study. Diabetes Care 1998;21:1288–1294

228. Sjöström L, Rissanen A, Andersen T, et al. Randomised placebo-controlled trial of orlistat for weight loss and prevention of weight regain in obese patients. European Multicentre Orlistat Study Group. Lancet 1998;352:167–172

229. Gadde KM, Allison DB, Ryan DH, et al. Effects of low-dose, controlled-release, phentermine plus topiramate combination on weight and associated comorbidities in overweight and obese adults (CONQUER): a randomised, placebo-controlled, phase 3 trial. Lancet 2011;377:1341–1352

230. Garvey WT, Ryan DH, Bohannon NJV, et al. Weight-loss therapy in type 2 diabetes: effects of phentermine and topiramate extended release. Diabetes Care 2014;37:3309–3316

231. Greenway FL, Fujioka K, Plodkowski RA, et al.; COR-I Study Group. Effect of naltrexone plus bupropion on weight loss in overweight and obese adults (COR-I): a multicentre, randomised, double-blind, placebo-controlled, phase 3 trial. Lancet 2010;376: 595–605

232. Hollander P, Gupta AK, Plodkowski R, et al.; COR-Diabetes Study Group. Effects of naltrexone sustained-release/bupropion sustained-release combination therapy on body weight and glycemic parameters in overweight and obese patients with type 2 diabetes. Diabetes Care 2013;36:4022–4029

233. Venditti EM, Wylie-Rosett J, Delahanty LM, Mele L, Hoskin MA, Edelstein SL. Short and long-term lifestyle coaching approaches used to address diverse participant barriers to weight loss and physical activity adherence. Int J Behav Nutr Phys Act 2014;11:16

234. Ariel-Donges AH, Gordon EL, Dixon BN, et al. Rural/urban disparities in access to the National Diabetes Prevention Program. Transl Behav Med 2020;10:1554–1558

235. Farrell E, Nadglowski J, Hollmann E, Le Roux CW, McGillicuddy D. "What would be left of me?" Patient perspectives on the risks of obesity treatment: an innovative health initiative stratification of obesity phenotypes to optimise future obesity therapy (IMI2 SOPHIA) qualitative study. Obes Pillars 2024;12: 100129

236. Fischer M, Oberänder N, Weimann A. Four main barriers to weight loss maintenance? A quantitative analysis of difficulties experienced by obese patients after successful weight reduction. Eur J Clin Nutr 2020;74:1192–1200

237. Ma J, Rosas LG, Lv N, et al. Effect of integrated behavioral weight loss treatment and problem-solving therapy on body mass index and depressive symptoms among patients with obesity and depression: the RAINBOW randomized clinical trial. JAMA 2019;321:869–879

238. Burgess E, Hassmén P, Welvaert M, Pumpa KL. Behavioural treatment strategies improve adherence to lifestyle intervention programmes in adults with obesity: a systematic review and meta-analysis. Clin Obes 2017;7:105–114

239. Perri MG, Nezu AM, McKelvey WF, Shermer RL, Renjilian DA, Viegener BJ. Relapse prevention training and problem-solving therapy in the long-term management of obesity. J Consult Clin Psychol 2001;69:722–726

240. Murawski ME, Milsom VA, Ross KM, et al. Problem solving, treatment adherence, and weight-loss outcome among women participating in lifestyle treatment for obesity. Eat Behav 2009; 10:146–151

241. D'Zurilla TJ, Nezu AM. Problem-solving therapy. In Handbook of cognitive-behavioral therapies, 3rd ed. New York, The Guilford Press, 2010, pp. 197–225

242. Coughlin JW, Gullion CM, Brantley PJ, et al. Behavioral mediators of treatment effects in the weight loss maintenance trial. Ann Behav Med 2013;46:369–381

243. Tasali E, Wroblewski K, Kahn E, Kilkus J, Schoeller DA. Effect of sleep extension on objectively assessed energy intake among adults with overweight in real-life settings: a randomized clinical trial. JAMA Intern Med 2022;182:365–374

244. Phelan S, Halfman T, Pinto AM, Foster GD. Behavioral and psychological strategies of long-term weight loss maintainers in a widely available weight management program. Obesity (Silver Spring) 2020;28:421–428

245. Dalcin AT, Jerome GJ, Fitzpatrick SL, et al. Perceived helpfulness of the individual components of a behavioural weight loss program: results from the Hopkins POWER trial. Obes Sci Pract 2015;1:23–32

246. Rubin RR, Peyrot M, Wang N-Y, et al. Patient-reported outcomes in the practice-based opportunities for weight reduction (POWER) trial. Qual Life Res 2013;22:2389–2398

247. Dawes AJ, Maggard-Gibbons M, Maher AR, et al. Mental health conditions among patients seeking and undergoing bariatric surgery: a meta-analysis. JAMA 2016;315:150–163

248. Bleich SN, Pickett-Blakely O, Cooper LA. Physician practice patterns of obesity diagnosis and weight-related counseling. Patient Educ Couns 2011;82:123–129

249. Podolsky MI, Raquib R, Hempstead K, Stokes AC. Trends in obesity care among US adults, 2010-2021. Med Care 2025; 63:234–240

250. Kraschnewski JL, Sciamanna CN, Pollak KI, Stuckey HL, Sherwood NE. The epidemiology of weight counseling for adults in the United States: a case of positive deviance. Int J Obes (Lond) 2013;37:751–753

251. Kushner RF. Barriers to providing nutrition counseling by physicians: a survey of primary care practitioners. Prev Med 1995;24:546–552

252. Wadden TA, Volger S, Tsai AG, et al.; POWER-UP Research Group. Managing obesity in primary care practice: an overview with perspective from the POWER-UP study. Int J Obes (Lond) 2013;37(Suppl 1):S3–S11

253. Bleich SN, Bennett WL, Gudzune KA, Cooper LA. National survey of US primary care physicians' perspectives about causes of obesity and solutions to improve care. BMJ Open 2012;2:e001871

254. Oshman L, Othman A, Furst W, et al. Primary care providers' perceived barriers to obesity treatment and opportunities for improvement: a mixed methods study. PLoS One 2023;18: e0284474

255. Chae K, German J, Kendrick K, et al. What are internal medicine residents' attitudes toward obesity as a disease, people living with obesity, and obesity treatment? Obes Sci Pract 2024;10:e748

256. Bleich SN, Bandara S, Bennett WL, Cooper LA, Gudzune KA. U.S. health professionals' views on obesity care, training, and self-efficacy. Am J Prev Med 2015;48:411–418

257. Iwamoto S, Saxon D, Tsai A, et al. Effects of education and experience on primary care providers' perspectives of obesity treatments during a pragmatic trial. Obesity (Silver Spring) 2018;26:1532–1538

258. Chae K, German J, Kendrick K, et al. An obesity medicine curriculum increases the obesity care self-efficacy of internal medicine residents in the primary care setting. Clin Obes 2024; 14:e12656

259. Laudenslager M, Chae K, Tackett S, Bertram A, Gudzune KA. An obesity care curriculum improves residents' self-efficacy and clinical practice habits. Obes Pillars 2025;16:100223

260. Fitzpatrick SL, Dickins K, Avery E, et al. Effect of an obesity best practice alert on physician documentation and referral practices. Transl Behav Med 2017;7:881–890

261. Tang JW, Kushner RF, Cameron KA, Hicks B, Cooper AJ, Baker DW. Electronic tools to assist with identification and counseling for overweight patients: a randomized controlled trial. J Gen Intern Med 2012;27:933–939

262. Gangadhar S, Nguyen N, Pesuit JW, et al. Effectiveness of a cloud-based EHR clinical decision support program for body mass index (BMI) screening and follow-up. AMIA Annu Symp Proc 2017;2017:742–749

263. Gudzune KA, Schwartz JL, Olsson K, et al. Centering weight management clinical decision support in primary care on patients with obesity and practitioners: a proof-of-concept study. Obes Sci Pract 2025;11:e70056

264. Griauzde DH, Turner CD, Othman A, et al. A primary care-based weight navigation program. JAMA Netw Open 2024;7:e2412192

265. Wild J, Kaizer A, Willems E, Kramer ES, Perreault L. Prelude to PATHWEIGH: pragmatic weight management in primary care. Fam Pract 2023;40:322–329

266. Ghosh J, Gudzune KA, Schwartz JL. Electronic health records tools for treating obesity among adult patients in primary care: a scoping review. Obes Pillars 2025;13:100161

267. Stokes A, Collins JM, Grant BF, et al. Prevalence and determinants of engagement with obesity care in the United States. Obesity (Silver Spring) 2018;26:814–818

268. Petrin C, Kahan S, Turner M, Gallagher C, Dietz WH. Current attitudes and practices of obesity counselling by health care providers. Obes Res Clin Pract 2017;11:352–359

269. Perreault L, Hockett CW, Holmstrom H, Tolle L, Kramer ES, Holtrop JS. PATHWEIGH tool for chronic weight management built into EPIC electronic medical record: methods, pilot results and future directions. J Obes Chronic Dis 2020;4:42–48

270. Porter J, Boyd C, Skandari MR, Laiteerapong N. Revisiting the time needed to provide adult primary care. J Gen Intern Med 2023;38:147–155

271. Walker R, Ramasamy V, Sturgiss E, Dunbar J, Boyle J. Shared medical appointments for weight loss: a systematic review. Fam Pract 2022;39:710–724

272. Shibuya K, Ji X, Pfoh ER, et al. Association between shared medical appointments and weight loss outcomes and anti-obesity medication use in patients with obesity. Obes Sci Pract 2020;6:247–254

273. Wei J, Lei L, Shieh A, Gupta D, Ahern S, Shen N. Program for Reducing Obesity (PRO): an institutional review of an insurance-based weight loss program utilizing shared medical appointments. Obes Sci Pract 2022;8:272–278

274. Griauzde DH, Othman A, Dallas C, et al. Developing weight navigation program to support personalized and effective obesity management in primary care settings: protocol for a quality improvement program with an embedded single-arm pilot study. Prim Health Care Res Dev 2022;23:e14

275. Ro SJ, Lackey AR, Aymes SE, et al. Impact of a community-based weight management program in a North Carolina health care system. Fam Med 2023;55:189–194

276. American Board of Obesity Medicine. Certifying Physicians. Accessed 12 March 2026. Available from https://www.abom.org/

277. Obesity Medicine Association. Certificate of Advanced Education in Obesity Medicine. 2026. Accessed 12 March 2026. Available from https://obesitymedicine.org/education/certificate-advanced-education/

278. American Academy of Physician Associates. Obesity Management in Primary Care Professional Development and Certificate Program. 2026. Accessed 12 March 2026. Available from https://www.aapa.org/education/primary-care-obesity-management-certificate-program/

279. American Society for Metabolic and Bariatric Surgery. Certified Bariatric Nurse. 2026. Accessed 12 March 2026. Available from https://asmbs.org/professional-development/cbn/

280. Commission on Dietetic Registration. Interdisciplinary Obesity and Weight Management Certification. 2026. Accessed 12 March 2026. Available from https://www.cdrnet.org/interdisciplinary

281. Agarwal M, Nadolsky K. Attitudes, perceptions, and practices among endocrinologists managing obesity. Endocr Pract 2022;28:179–184

282. Rajagopal S, Wickham EP, Reid TJ, Brittan DR, Korner J, Gudzune KA. Comparing clinical practice habits among obesity medicine physicians by patient, physician and clinic factors. Obes Pillars 2025;13:100157

283. Suresh K, Holtrop JS, Dickinson LM, et al. PATHWEIGH, pragmatic weight management in adult patients in primary care in Colorado, USA: study protocol for a stepped wedge cluster randomized trial. Trials 2022;23:26

284. Banerjee ES, Gambler A, Fogleman C. Adding obesity to the problem list increases the rate of providers addressing obesity. Fam Med 2013;45:629–633

285. Kasher Meron M, Eizenstein S, Cukierman-Yaffe T, Oieru D. Missed diagnosis-a major barrier to patient access to obesity healthcare in the primary care setting. Int J Obes (Lond) 2024;48:1003–1010

286. Dhurandhar NV, Kyle T, Stevenin B, Tomaszewski K; ACTION Steering Group. Predictors of weight loss outcomes in obesity care: results of the national ACTION study. BMC Public Health 2019;19:1422

287. Ciemins EL, Joshi V, Cuddeback JK, Kushner RF, Horn DB, Garvey WT. Diagnosing obesity as a first step to weight loss: an observational study. Obesity (Silver Spring) 2020;28:2305–2309

288. Mattar A, Carlston D, Sariol G, et al. The prevalence of obesity documentation in primary care electronic medical records. Are we acknowledging the problem? Appl Clin Inform 2017;8:67–79

289. Pantalone KM, Hobbs TM, Chagin KM, et al. Prevalence and recognition of obesity and its associated comorbidities: cross-sectional analysis of electronic health record data from a large US integrated health system. BMJ Open 2017;7:e017583

290. Mocarski M, Tian Y, Smolarz BG, McAna J, Crawford A. Use of International Classification of Diseases, Ninth Revision Codes for Obesity: trends in the United States from an Electronic Health Record-Derived Database. Popul Health Manag 2018;21:222–230

291. Hu G, Lesneski E. The differences between claim-based health risk adjustment models and cost prediction models. Dis Manag 2004;7:153–158

292. Ard J, Kaplan LM, Kahan S, et al. Perspectives on obesity management and the use of anti-obesity medicine from US employees and employers: results from the OBSERVE study. Popul Health Manag 2025;28:150–160

293. Jinnett K, Kyle T, Parry T, Stevenin B, Ramasamy A; ACTION Steering Group. Insights into the role of employers supporting obesity management in people with obesity: results of the national ACTION study. Popul Health Manag 2019;22:308–314

294. Brechue WF, Abe T. The role of FFM accumulation and skeletal muscle architecture in powerlifting performance. Eur J Appl Physiol 2002;86:327–336

295. Afshin A, Forouzanfar MH, Reitsma MB, et al. Health effects of overweight and obesity in 195 countries over 25 years. N Engl J Med 2017;377:13–27

296. Di Angelantonio E, Bhupathiraju SN, Wormser D, et al.; Global BMIMC. Body-mass index and all-cause mortality: individual-participant-data meta-analysis of 239 prospective studies in four continents. Lancet 2016;388:776–786

297. Aune D, Sen A, Prasad M, et al. BMI and all cause mortality: systematic review and non-linear dose-response meta-analysis of 230 cohort studies with 3.74 million deaths among 30.3 million participants. BMJ 2016;353:i2156

298. GBD 2021 Adult BMI Collaborators. Global, regional, and national prevalence of adult overweight and obesity, 1990-2021, with forecasts to 2050: a forecasting study for the Global Burden of Disease Study 2021. Lancet 2025;405:813–838

299. Ward ZJ, Bleich SN, Long MW, Gortmaker SL. Association of body mass index with health care expenditures in the United States by age and sex. PLoS One 2021;16:e0247307

300. Echouffo-Tcheugui JB, Short MI, Xanthakis V, et al. Natural history of obesity subphenotypes: dynamic changes over two decades and prognosis in the Framingham Heart Study. J Clin Endocrinol Metab 2019;104:738–752

301. Trout K, Winter VR, Harrop E, ONeill E, Puhl R, Bartlett-Esquilant G. The role of body image and refusal to be weighed: implications for primary healthcare. Ann Fam Med 2023;21:3693

302. NHLBI Obesity Education Initiative Expert Panel on the Identification, Evaluation, and Treatment of Obesity in Adults. Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults: executive summary. Expert Panel on the Identification, Evaluation, and Treatment of Overweight in Adults. Am J Clin Nutr 1998;68:899–917

303. Retat L, Pimpin L, Webber L, et al. Screening and brief intervention for obesity in primary care: cost-effectiveness analysis in the BWeL trial. Int J Obes (Lond) 2019;43:2066–2075

304. Tsai AG, Wadden TA, Volger S, et al. Cost-effectiveness of a primary care intervention to treat obesity. Int J Obes (Lond) 2013;37(Suppl 1):S31–S37

305. Gudzune KA, Johnson VR, Bramante CT, Stanford FC. Geographic availability of physicians certified by the American Board of Obesity Medicine relative to obesity prevalence. Obesity (Silver Spring) 2019;27:1958–1966

306. Pollack CC, Onega T, Emond JA, et al. A national evaluation of geographic accessibility and provider availability of obesity medicine diplomates in the United States between 2011 and 2019. Int J Obes (Lond) 2022;46:669–675

307. Pivetta B, Chen L, Nagappa M, et al. Use and performance of the STOP-Bang questionnaire for obstructive sleep apnea screening across geographic regions: a systematic review and meta-analysis. JAMA Netw Open 2021;4:e211009

308. Yanovski SZ, Marcus MD, Wadden TA, Walsh BT. The Questionnaire on Eating and Weight Patterns-5: an updated screening instrument for binge eating disorder. Int J Eat Disord 2015;48:259–261

309. Mitchell KS, Serier KN, Vogt DS, Smith BN, Cooper Z. Eating disorder screening measures in post-9/11 veteran men and women. Psychol Assess 2025;37:172–179

310. Levis B, Sun Y, He C, et al.; Depression Screening Data (DEPRESSD) PHQ Collaboration. Accuracy of the PHQ-2 alone and in combination with the PHQ-9 for screening to detect major depression: systematic review and meta-analysis. JAMA 2020;323:2290–2300

311. Park S-H, Park SK. An updated systematic review and meta-analysis of the predictive validity of the general anxiety disorder (GAD)-7 and GAD-2 in screening for anxiety disorders. J Affect Disord 2025;391:119913

312. Cusi K, Abdelmalek MF, Apovian CM, et al. Metabolic dysfunction-associated steatotic liver disease (MASLD) in people with diabetes: the need for screening and early intervention. A consensus report of the American Diabetes Association. Diabetes Care 2025;48:1057–1082

313. Vistisen D, Witte DR, Tabák AG, et al. Patterns of obesity development before the diagnosis of type 2 diabetes: the Whitehall II cohort study. PLoS Med 2014;11:e1001602

314. Sanaya N, Janusaite M, Dalamaga M, Magkos F. The physiological effects of weight-cycling: a review of current evidence. Curr Obes Rep 2024;13:35–50

315. Jayedi A, Rashidy-Pour A, Soltani S, Zargar MS, Emadi A, Shab-Bidar S. Adult weight gain and the risk of cardiovascular disease: a systematic review and dose-response meta-analysis of prospective cohort studies. Eur J Clin Nutr 2020;74:1263–1275

316. Calling S, Johansson S-E, Nymberg VM, Sundquist J, Sundquist K. Trajectories of body mass index and risk for coronary heart disease: a 38-year follow-up study. PLoS One 2021;16:e0258395

317. Stokes A, Preston SH. Revealing the burden of obesity using weight histories. Proc Natl Acad Sci U S A 2016;113:572–577

318. Howell CR, Fontaine K, Ejima K, Ness KK, Cherrington A, Mehta T. Maximum lifetime body mass index and mortality in Mexican American adults: the National Health and Nutrition Examination Survey III (1988–1994) and NHANES 1999-2010. Prev Chronic Dis 2017;14:E67

319. Ogden J, Stavrinaki M, Stubbs J. Understanding the role of life events in weight loss and weight gain. Psychol Health Med 2009;14:239–249

320. van der Sande MA, Walraven GE, Milligan PJ, et al. Family history: an opportunity for early interventions and improved control of hypertension, obesity and diabetes. Bull World Health Organ 2001;79:321–328

321. Paradis A-M, Pérusse L, Godin G, Vohl M-C. Validity of a self-reported measure of familial history of obesity. Nutr J 2008;7:27

322. Hemmingsson E, Nowicka P, Ulijaszek S, Sørensen TIA. The social origins of obesity within and across generations. Obes Rev 2023;24:e13514

323. Puhl RM, Lessard LM, Himmelstein MS, Foster GD. The roles of experienced and internalized weight stigma in healthcare

experiences: perspectives of adults engaged in weight management across six countries. PLoS One 2021;16:e0251566

324. Rubino F, Puhl RM, Cummings DE, et al. Joint international consensus statement for ending stigma of obesity. Nat Med 2020;26:485–497

325. Bredin SSD, Gledhill N, Jamnik VK, Warburton DER. PAR-Q+ and ePARmed-X+: new risk stratification and physical activity clearance strategy for physicians and patients alike. Can Fam Physician 2013;59:273–277

326. Barrington WE, Ceballos RM, Bishop SK, McGregor BA, Beresford SAA. Perceived stress, behavior, and body mass index among adults participating in a worksite obesity prevention program, Seattle, 2005-2007. Prev Chronic Dis 2012;9:E152

327. Järvelä-Reijonen E, Karhunen L, Sairanen E, et al. High perceived stress is associated with unfavorable eating behavior in overweight and obese Finns of working age. Appetite 2016; 103:249–258

328. Jalo E, Konttinen H, Westerterp-Plantenga M, et al. Perceived stress as a predictor of eating behavior during the 3-year PREVIEW lifestyle intervention. Nutr Diabetes 2022;12:47

329. Dixon JB, Dixon ME, Anderson ML, Schachter L, O'Brien PE. Daytime sleepiness in the obese: not as simple as obstructive sleep apnea. Obesity (Silver Spring) 2007;15:2504–2511

330. Park JS, Bramante C, Vakil R, Lee G, Gudzune K. Affordability and features of home scales for self-weighing. Clin Obes 2021; 11:e12475

331. Singh GK, Kogan MD, Van Dyck PC, Siahpush M. Racial/ethnic, socioeconomic, and behavioral determinants of childhood and adolescent obesity in the United States: analyzing independent and joint associations. Ann Epidemiol 2008;18:682–695

332. Billioux A, Verlander K, Anthony S, Alley D. Standardized screening for health-related social needs in clinical settings: the accountable health communities screening tool. In *NAM Perspectives*. Washington, DC, National Academy of Medicine, 2017

333. Bray GA, Kim KK, Wilding JPH; World Obesity Federation. Obesity: a chronic relapsing progressive disease process. A position statement of the World Obesity Federation. Obes Rev 2017;18:715–723

334. Perdomo CM, Avilés-Olmos I, Dicker D, Frühbeck G. Towards an adiposity-related disease framework for the diagnosis and management of obesities. Rev Endocr Metab Disord 2023;24:795–807

335. Rodríguez-Flores M, Goicochea-Turcott EW, Mancillas-Adame L, et al. The utility of the Edmonton Obesity Staging System for the prediction of COVID-19 outcomes: a multi-centre study. Int J Obes (Lond) 2022;46:661–668

336. Bettini S, Quinto G, Neunhaeuserer D, et al. Edmonton Obesity Staging System: an improvement by cardiopulmonary exercise testing. Int J Obes (Lond) 2021;45:1949–1957

337. Kushner RF, Kushner N. Dr. Kushner's Personality Type Diet. New York, St. Martin's Press, 2003