

Weight History in Clinical Practice: The State of the Science and Future Directions

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Eliciting a weight history can provide clinically important information to aid in treatment decision-making. This view is consistent with the life course perspective of obesity and the aim of patient-centered care, one of six domains of health care quality. However, thus far, the value and practicality of including a weight history in the clinical assessment and treatment of patients with obesity have not been systematically explored. For these reasons, the Clinical Committee of The Obesity Society established a task force to review and assess the available evidence to address five key questions. It is concluded that weight history is an essential component of the medical history for patients presenting with overweight or obesity, and there are strong and emerging data that demonstrate the importance of life stage, duration of exposure to obesity, maximum BMI, and group-based trajectory modeling in predicting risk for increased morbidity and mortality. Consideration of these and other patient-specific factors may improve risk stratification and clinical decision-making for screening, counseling, and management. Recommendations are provided for the key elements that should be included in a weight history, and several needs for future clinical research are outlined.

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Introduction

Obesity is a disease (1) and a major contributor to noncommunicable causes of death, both globally and in the United States (2). Obesity results from the complex interplay of environmental, social, behavioral, psychological, genetic, and biological determinants that alter energy balance. Although population and clinical research help to elucidate epidemiological trends, causes, and consequences of obesity, the interactions between these determinants of the development and progression of obesity can be challenging to study because they vary from individual to individual. Furthermore, many other personal influences on body weight, such as cultural contextualization, transitional life events, and emotional adaptability and resilience to stressors, are not typically considered in population studies. Eliciting a patient's weight history can capture clinically important information not typically included in population or clinical research to aid in treatment decision-making.

The life course perspective posits that various biological, psychosocial, and cognitive factors throughout life can independently, cumulatively, and interactively influence health and disease risk (3,4). This

perspective is consistent with the complex nature of obesity and the aim of patient-centered care, one of six domains of health care quality (5). "Patient-centered" is defined as "providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions" (5). A weight history is necessary to obtain this personal, patient-specific information. Furthermore, a weight history has the potential to capture information that may impact the risk of other diseases, and it contains elements that contribute to a comprehensive social history, such as health-related behaviors, emotional health, and life circumstances (6). However, the term weight history has not been fully defined and is not typically included in the medical history by primary care providers.

Thus far, the value and practicality of including a weight history in the clinical assessment and treatment of patients with obesity have not been systematically explored, and training in taking a weight history has not traditionally been included in medical education. Further examination of this topic will be useful for clinicians when assessing patients who present with obesity or obesity-related complications. For these reasons, the Clinical

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Committee of The Obesity Society established a task force to review and assess the available evidence to address the following five key questions:

1. What is the evidence regarding the importance of weight gain pattern and trajectory for the development of morbidity and mortality?
2. What is the utility of taking a weight history?
3. What are the factors that encourage or discourage obtaining and using a weight history?
4. What are the key elements of a weight history?
5. What are the future clinical research directions in assessing the value of taking a weight history?

Question 1: What is the Evidence Regarding the Importance of Weight Gain Pattern and Trajectory for the Development of Morbidity and Mortality?

To evaluate whether historical information on a patient's weight gain (or loss) pattern and trajectory can inform risk stratification and treatment options, we searched PubMed for published research evaluating associations of weight history and trajectory with morbidity and mortality outcomes in adults. The committee does not assume that this approach is systematic in nature. Three themes arose from the literature search: (1) the importance of a history of obesity, life stage, and duration of exposure to obesity; (2) the importance of maximum BMI; and (3) the use of group-based trajectory modeling (GBTM).

Importance of history of obesity, life stage, and duration of exposure to obesity

BMI as a population-level measurement of overweight and obesity has been shown to be associated with risk for mortality in multiple large population studies across multiple continents (7-9). Other studies, however, have questioned not only the value of a single BMI measure to predict increased risk conclusively (10) but also its diagnostic accuracy (11,12). Importantly, several studies have shown a significant correlation between a history of obesity and risk for later-life comorbidity, compared with current weight or obesity status alone. For example, Stokes et al. (13) demonstrated that, among nonpregnant adults without obesity at the time of the study, in those persons who reported a past history of obesity (lifetime maximum BMI > 30 kg/m²), there was an increased prevalence of eight obesity-related diseases (type 2 diabetes [T2DM], congestive heart failure, coronary heart disease, angina, myocardial infarction, cerebral vascular accident, arthritis, and liver disease). Likewise, the odds ratio for each of the eight comorbid diseases was significantly higher among individuals with a past history of obesity than among those who never had obesity.

Other studies have focused on the timing for developing obesity and the future risk for morbidity and mortality. Body weight data and obesity-related conditions of 12,686 Americans aged 14 to 22 years at baseline from the National Longitudinal Survey of Youth 1979 were recorded over 18 years (14). Participants who experienced early and rapid weight gain during early adulthood were most likely to develop hypertension, T2DM, and arthritis in middle age. In a study by Zheng et al. (15), a cohort of 92,837 women and 25,303 men who recalled their weights during early adulthood (18-21 years of age) and reported current weight at age 55 were then followed up to record incident disease outcomes. Weight gain from early to middle adulthood was associated with significantly increased risk for obesity-associated cancers, as

well as T2DM and cardiovascular disease (CVD), and decreased odds of "healthy aging" (a composite of 11 chronic diseases and cognitive or physical impairment). Higher degrees of weight gain were associated with markedly increased risks (15). These studies demonstrate the impact of body weight gain in early adult life as a critical period in predicting risk and development of multiple CVDs, T2DM, and certain cancers.

Inherent in the concept of the early development of obesity is the effect of long-term exposure. In the Prospective Study Collaboration, which analyzed 1.46 million white adults 19 to 84 years of age, the relative risk of all-cause mortality was highest among those developing obesity at a younger age or with the longest exposure to elevated weight (9). The association of number of years lived with obesity and mortality was further examined by Abdullah et al. (16) in a study of 5,036 participants from the Framingham Cohort Study who were followed for up to 48 years. The authors found that there was a direct relationship between the adjusted hazard ratio for mortality and number of years lived with obesity. For those with BMI ≥ 30 kg/m², for years 1.0-4.9, 5.0-14.9, 15-24.9, and ≥ 25 of the study follow-up period, adjusted hazard ratios for all-cause mortality were 1.51, 1.94, 2.25, and 2.52, respectively. These data are reminiscent of the clinical practice of assessing lifetime use of tobacco based on the relationship between tobacco exposure and adverse health outcomes (17).

Importance of maximum BMI

Historically, most cohort studies evaluating the association between weight or BMI and mortality use single baseline body weights. Recent studies have highlighted the importance of using maximum body weight for predicting risk, defined as the highest BMI during the weight history period. Yu et al. (18) evaluated 225,000 men and women over 12.3 years of follow-up, during which 32,571 deaths occurred. Compared with those maintaining normal weight over 16 years, those with maximum BMI in the overweight, obesity class I (BMI 30-35 kg/m²), and obesity class II (BMI ≥ 35 kg/m²) categories had significantly and progressively increased risk for all-cause mortality, CVD mortality, stroke mortality, cancer mortality, and respiratory disease mortality. Xu et al. (19) investigated the association between maximum BMI and all-cause mortality among participants from the original and offspring Framingham Heart Studies for a combined sample of 6,197 participants. A total of 77.3% had a history of overweight or obesity using the participant's maximum BMI, while 66.5% had overweight or obesity based on baseline BMI. The investigators found a direct association between maximum BMI over 24 years of weight history and all-cause mortality across class I and II obesity categories compared with normal weight. Stokes and Preston (20) examined the association between excess weight and mortality using data from the 1988-1999 and 1999-2010 waves of the National Health and Nutrition Examination Survey among adults aged 50 to 74 at the time of the survey. The authors found that disease prevalence and mortality both rose with increases in maximum weight and/or BMI. Age-standardized mortality rates (per 1,000 person years), stratified by maximum BMI, were 6.25, 16.81, and 34.62, respectively, for cohorts that never exceeded normal weight, cohorts with formal overweight, and cohorts with former obesity. These studies support the importance of including maximum weight when taking a weight history.

Use of GBTM

Multiple studies have begun to assess how weight change over the life course can be predicted and may influence future disease risk. Using GBTM, critical periods of exposure and patterns of weight

change can be identified (21). Pooling two large prospective cohort studies yielding combined data on 409,796 individuals, Petrick et al. (22) observed that continued increases in excess weight across the life course, particularly when weight gain begins by early adulthood, is associated with increased risks of esophageal and gastric cardia adenocarcinomas. The strongest associations were seen for individuals who had a trajectory of overweight at the onset of adulthood and progressed to obesity in later life. Specifically, a weight gain of ≥ 20 kg between age 20 and baseline (age 50-79 years) was associated with a 97% increased risk of esophageal cancer compared with stable weight. Trajectories of different patterns of weight gain or body shape changes are associated with elevated risk for T2DM (23) and all-cause mortality (24). Understanding trajectories can facilitate targeting of high-risk individuals and employing weight-management strategies at earlier ages.

Of notable interest to both clinicians and researchers, historical weight and weight-change data may help explain the perceived paradoxical association between overweight and mortality, often referred to as an “obesity paradox,” in which several epidemiological studies have associated slightly lower mortality risk among overweight or class I obesity compared with normal weight. Long believed to be an issue of reverse causation, recent studies have shown a reversal of this paradox when the analyses incorporate exposure measures of weight history (maximum lifetime weight, weight trajectory, etc.) rather than only evaluating risk based on a single baseline weight. For example, in the study cited previously by Yu et al. (18), there was an inverse association between overweight and mortality when the weight exposure was defined as a single baseline measurement. However, when analyzed by maximum BMI, participants with overweight had significantly greater mortality risk. Similarly, studies accounting for baseline presence of chronic disease or smoking, both of which are associated with lower weights or weight loss but increased mortality risk, suggest that no such obesity paradox exists (25).

Inherent in this body of research is the challenge of accurately recalling historical body weight and weight changes. Although few studies have addressed this issue, there appears to be a large variation between measured and recalled weight (26,27). This observation should be considered when taking a weight history. Nonetheless, for each of the themes discussed, including a weight history as part of a medical evaluation may improve risk stratification and aid in clinical decision-making for screening, counseling, management, and consideration of treatment options.

Question 2: What is the Utility of Taking a Weight History?

Studies have demonstrated that patients who share their perspective with health care providers achieve better outcomes (28). However, the patient perspective is often lost in clinical encounters. Patient-centered interviewing can not only enhance the effectiveness of care in complex patient encounters but can also improve longer-term physiological status, treatment adherence, quality of life, patient-provider working relationship, and patient and provider satisfaction (29). To date, to our knowledge, there have been no studies that have formally evaluated the utility of taking a weight history. It has been theorized that if the weight history is conducted properly, patients should feel validated and acknowledged regarding their weight journey, and clinicians should feel more empathetic and informed to provide meaningful and practical patient-centered treatment (30).

Individual contextualization factors

When thoroughly conducted, a weight history can identify contributors to a patient’s weight gain and assess the patient’s knowledge about the multiplicity of contributing factors. Furthermore, many patients have encountered weight bias and may blame themselves for their excess weight (31), potentially contributing to underlying depression, poor self-esteem and body image, and disordered eating when this stigma is internalized. Identifying causative factors should lead to more targeted and appropriate treatments. For example, if the history suggests a genetic condition or a secondary cause of obesity, appropriate screening should be pursued (32). By discussing diets that have been successful or ineffective, providers can recommend tailored lifestyle interventions that support self-efficacy. Furthermore, a history of not responding to a lifestyle treatment approach or inability to maintain weight loss can help to identify patients who are potential candidates for anti-obesity medications and/or bariatric surgery (32,33). Table 1 includes cognitive, psychological, and behavioral variables from the literature that have been associated with weight change (34-42). Although many of these factors will not be measured objectively during the clinical encounter, they can be ascertained by taking a well-informed and probing history and offer valuable insights for the clinician. By personalizing the treatment plan based on these and other historical factors obtained from the weight history, a more tailored treatment plan can be provided.

Factors obtained from the weight history can also identify patients at increased risk of morbidity and mortality. The Edmonton Obesity Staging System incorporates weight-related health problems and mental health and quality of life factors that are independent of BMI (43). The Edmonton Obesity Staging System, as well as other staging systems, offer providers a useful approach to tailor weight-management interventions based on health risk assessment.

Outcome predictors

Information obtained during the weight history can help facilitate discussion of reasonable goals and expected outcomes for weight loss and weight maintenance. One study suggests that a greater number of past weight-loss attempts and a greater magnitude of largest past weight loss can predict greater weight loss (44). Other studies, however, have reported that greater weight loss can be predicted by fewer previous weight-loss attempts with assistance, the absence of previous dietary or herbal weight-loss supplement use, and greater maximum weight loss in previous attempts (45). Further research is needed, but it appears that patients could achieve greater weight loss when interventions are customized based on past weight-loss behaviors and outcomes.

Question 3: What are the Factors that Encourage or Discourage Obtaining and Using a Weight History?

Very little is known about specific factors that encourage, discourage, or otherwise influence whether clinicians obtain a weight-related history in clinical practice. Although studies have not specifically evaluated barriers to taking a weight history, it is possible that those barriers that limit obesity counseling in general are also applicable to weight history-taking (46). Cited barriers include a lack of reimbursement, limited time during office visits, lack of training in counseling, competing demands, low confidence

TABLE 1 Psychosocial and behavioral variables associated with weight change (34-42)

Domains	Variable	Description	Weight gain	Weight loss
Cognitive	Dichotomous thinking	The tendency to think in terms of polar opposites, such as “good or bad” or “black or white”	✓	
	Conscientiousness	The degree that a person controls, regulates, and directs impulses		✓
	Vigilance	Devoted attentiveness or watchfulness		✓
Psychological	Dissatisfaction with weight achieved	Concern about weight or shape	✓	
	Adverse childhood experiences	All types of abuse, neglect, and other potentially traumatic experiences that occur to people under the age of 18	✓	
	Self-efficacy	An individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments		✓
	Self-regulation	Controlling one's behavior, emotions, and thoughts in the pursuit of long-term goals		✓
Personality	Novelty seeking	Personality trait associated with impulsive decision-making, extravagance in approach to reward cues, quick loss of temper, and avoidance of frustration	✓	
	Lower persistence	Ability to follow a course of action in spite of difficulty or opposition	✓	
	Lower self-directiveness	Ability to regulate and adapt behavior to the demands of a situation in order to achieve personally chosen goals and values	✓	
Behavioral	Adherence	Sticking to a course of action		✓
	Self-monitoring	Observing and evaluating one's behavior		✓
	Dietary restraint	Limiting the overall amount of food eaten, what foods are eaten, or both	✓	

in the ability to treat and change patient behaviors, limited resources, the perception that patients are not motivated, and a paucity of proven and effective interventions to treat obesity (47,48). In a study of family medicine, internal medicine, and obstetrician/gynecologist physicians and nurse practitioners, 66% of those that viewed obesity counseling as their responsibility felt that additional time with patients would improve their ability to conduct the counseling (49). Financial reimbursement was a lesser issue. These practice-based barriers are similar to those cited for delivery of nutrition counseling by primary care providers (50,51). Another barrier to obesity counseling identified in studies was perceived lack of training in obesity management and language to avoid offending patients (49). Providers may also feel that counseling is futile because of general lack of patient success, and/or they may be concerned that discussing topics perceived as sensitive could interfere with the patient-provider relationship (52,53).

There may also be certain patient and/or provider characteristics that impact whether a weight history is obtained. Once again, no studies have evaluated this question specifically. Factors that decrease the likelihood of an individual receiving obesity counseling may include perceived stigma (54) and perhaps also patient discomfort addressing weight with health care providers. Race has also been proposed as a factor that may affect obesity counseling, treatment, and outcomes potentially because of cultural and/or ethnic differences in attitude toward weight (49). Additionally, weight bias among health professionals may lead to reluctance to provide weight-focused health care (55). These factors highlight the importance of using culturally and socially sensitive language and communication strategies in treating patients with obesity, and it may be specifically relevant to eliciting a weight-related history. For these reasons, broaching the topic of obesity may be difficult for many providers. “Why Weight? A Guide to Discussing Obesity & Health With You Patients” (56) is a discussion toolkit that provides multiple communication strategies for initiating

a conversation with patients about their weight. In sum, further studies are needed to understand what factors encourage or discourage clinicians from taking weight-related histories in clinical practice.

Question 4: What are the Key Elements of a Weight History?

The weight history is a “history of present illness” (HPI) for obesity and weight changes. The HPI includes (57):

- The changes in health that led the patient to seek medical attention, including a clear, chronological explanation of the patient's symptoms
- Information relevant to the chief complaint, including answers to questions of what, when, how, where, which, who, and why
- Information to inform the interviewer to comprehend the sequential development of the underlying pathologic process

The mnemonic “OPQRST” is commonly used for ascertaining the patient's chief complaint and HPI (30,57) and can be adapted for taking a weight history: **o**nset, **p**recipitating events, **q**uality of health, **r**emedy, **s**etting, and **t**emporal pattern. Examples of questions that can be used to explore these features are provided in Table 2. These features provide a contextual understanding of how and when patients gained weight, what management efforts were employed, and the impact of body weight on their health.

Additionally, using a narrative (58) or autobiographical approach to obtaining the weight history allows patients to express in their own words a life-course description of the underlying burden, frustration,

TABLE 2 Using the mnemonic OPQRST to take the weight history (30)

	Sample questions
Onset	“When did you first begin to gain weight?” “Have you struggled with your weight since childhood?” “What did you weigh in high school, college, early 20s, 30s, 40s?” “Did the weight gain begin when you started taking a certain medication?”
Precipitating	“What life events may have led to your weight gain—such as college, work stress, marriage, divorce, financial loss, a period of depression, onset of an illness?” “How much weight did you gain with pregnancy?” “How much weight did you gain when you stopped smoking?” “How much additional weight did you gain when you started insulin?” “Do you recall specific challenges or barriers to maintaining weight loss that led to regaining weight?”
Quality of life	“At what weight did you feel your best?” “What is hard to do at your current weight?” “How does your weight affect how you feel and function?”
Remedy	“What have you tried in the past, if anything, to control your weight?” “What dietary changes, if any, have you attempted in order to control weight?” “What physical activity changes, if any, have you tried to control your weight?” “Which medications, if any, have you taken to help control your weight?” “What supplements, if any, have you tried in hopes of losing weight?” “What have you found to be particularly helpful when trying to lose weight?”
Setting	“What was going on in your life when you last felt in control of your weight?” “What was going on when you gained your weight?” “What role has stress played in your weight gain?” “How important is social support or having a buddy to help you?” “Which people in your life, if any, have been helpful to support your efforts to control your weight?”
Temporal pattern	“What is the pattern of your weight gain?” “Did you gradually gain your weight over time, or is it more cyclic (yo-yo)?” “Are there large swings in your weight, and if so, what is the weight change?” “What was your lightest weight and heaviest weight as an adult?”

challenges, stigma, or shame associated with trying to manage body weight. The patient’s narrative also enables clinicians to assess attitudes, knowledge, motivation, decision-making, and resilience regarding weight management. The narrative provides a basis for approaching the patient’s weight systematically, as well as beginning to formulate diagnostic and therapeutic options (59). If time permits, an additional technique is to ask patients to graph their weight changes over time, inserting life events or treatments that they feel were temporally related to weight changes (60,61).

Assessing behaviors and other factors: dietary intake

Dietary assessment provides a point of action for risk reduction and treatment of obesity, but it is difficult to measure accurately. Among validated tools available for dietary assessment, the 24-hour dietary recall and food frequency questionnaires have the most utility in a clinical setting (62). The major benefit of a 24-hour dietary recall is the assessment of dietary patterns, as well as portion sizes, beverages consumed (including alcohol), and eating location. The importance of temporal food patterning has been highlighted by studies emphasizing its role in metabolic disease and obesity (63,64). Assessment of dietary quality provides a foundation for nutrition counseling. Table 3 provides two open-ended questions that can be used for dietary assessment.

Assessing behaviors and other factors: disordered eating patterns

In particular, binge eating disorder and night eating syndrome contribute to weight gain and comorbid conditions associated with obesity (65). Individuals with past or current disordered eating often feel ashamed and distressed by their eating behavior, making it important for the provider to assess for these disorders. The assessment and diagnosis can be supported by in-office screening questionnaires (Table 4). Identification

of disordered eating allows the provider to make appropriate referral or treatment decisions (66-70). For example, many patients with obesity and binge eating disorder who present for weight management report substantial weight gain over the previous year (71).

Two additional eating disorders should also be assessed in this population. Bulimia nervosa involves recurrent binge eating episodes coupled with inappropriate compensatory behaviors aimed at preventing weight gain, such as self-induced vomiting, misuse of laxatives, or strenuous exercise (72). Patients with a history of anorexia nervosa, characterized by low body weight and restricted food intake, require additional sensitivity when prescribing a calorie-controlled diet as this could be triggering (73).

Assessing behaviors and other factors: physical activity

Physical activity plays an important role in weight-loss maintenance and in the prevention of weight gain (74,75). In obtaining a comprehensive history, it is important to understand which phase of weight management is applicable to the patient (has not initiated weight loss versus active weight loss versus weight-loss maintenance) and the amount of physical activity currently performed so appropriate physical activity questions are asked and recommendations are made. Assessing the current status of the patient’s physical activity will further the

TABLE 3 Practical assessment of diet (62)

Assuming yesterday was a typical day for you, to the best of your ability please tell me what you ate and drank since midnight the day before yesterday until midnight yesterday?
 If yesterday was not a typical day, can you relate what you ate on a typical day within the past 3 days?

understanding of the patient's cardiorespiratory fitness level and possible neurological and musculoskeletal limitations that may aid in prescribing the most appropriate and tailored physical activity regimen. In terms of clearance and risk classification for initiating a physical activity regimen, it is important to assess for presence or absence of CVD risk factors, as well as signs or symptoms of known cardiovascular, pulmonary, renal, neuromuscular, orthopedic, or metabolic disease (76,77). It is also important to understand the variables predisposing an individual to be physically active or inactive, i.e., social, cultural, demographics, and biological factors (78). Variables include understanding the patient's attitude toward initiating or continuing physical activity (i.e., time consuming, unpleasant, painful) and the barriers and motivations to follow a prescribed physical activity regimen. Table 5 includes questions that should be considered for obtaining a physical activity history (79-83).

TABLE 4 Assessing for eating disorders

Diagnostic criteria for night eating syndrome (NES) (69)

The daily pattern of eating demonstrates a significantly increased intake in the evening and/or nighttime, as manifested by one or both of the following:

- At least 25% of food intake is consumed after the evening meal
- At least two episodes of nocturnal eating per week

Awareness and recall of evening and nocturnal eating episodes are present.

The clinical picture is characterized by at least three of the following features:

- Lack of desire to eat in the morning and/or breakfast is omitted on four or more mornings per week
- Presence of a strong urge to eat between dinner and sleep onset and/or during the night
- Sleep onset and/or sleep maintenance insomnia are present four or more nights per week
- Presence of a belief that one must eat in order to initiate or return to sleep
- Mood is frequently depressed and/or mood worsens in the evening

The disorder is associated with significant distress and/or impairment in functioning.

The disordered pattern of eating has been maintained for at least 3 months.

The disorder is not secondary to substance abuse or dependence, medical disorder, medication, or another psychiatric disorder.

DSM-5 criteria for diagnosis of binge eating disorder (70)

Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:

- Eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances
- A sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating)

The binge eating episodes are associated with three or more of the following:

- Eating much more rapidly than normal
- Eating until feeling uncomfortably full
- Eating large amounts of food when not feeling physically hungry
- Eating alone because of feeling embarrassed by how much one is eating
- Feeling disgusted with oneself, depressed, or very guilty afterward

Marked distress regarding binge eating is present.

Binge eating occurs, on average, at least once a week for 3 months.

Assessing behaviors and other factors: stress

Stress has been proposed as a possible contributor to obesity, in part because of activation of the adrenal cortical axis and elevated cortisol levels (84). Epidemiological studies have supported the relationship between stress and obesity in children and adults (85,86). In addition, stress is associated with risk of CVD (87) and T2DM (88). The 10-item Perceived Stress Scale is the best validated of all these measures in adults (89), but because of its length, the abbreviated Perceived Stress Scale-4 is a better alternative in clinical settings (Table 6) (90). Assessment of stress using the stress perception scale, in addition to assessment for mood disorders at the initial encounter, should help prioritize stress management or psychological care in adult patients who are likely to derive the most benefit.

Assessing behaviors and other factors: sleep

Sleep disturbances and circadian patterning are associated with weight gain and obesity, as seen in shift workers with disrupted circadian rhythms (91) and in children and adults with short sleep durations (92). In addition to sleep duration, the quality of sleep, number of nocturnal awakenings, and presence of sleep apnea are essential determinants of restful sleep. Because obstructive sleep apnea is an important comorbidity associated with obesity, the risk should also be assessed as part of the history.

The best validated sleep quality questionnaire is the Pittsburgh Sleep Quality Index (93); however, it is not practical for use outside sleep clinics. A brief sleep history incorporating some aspects of the Pittsburgh Sleep Quality Index questionnaire may be helpful in providing a framework for assessment and treatment (Table 7).

TABLE 5 Practical assessment of physical activity (79-83)

- What is the most physically active thing you do in the course of the day? (Examples may include walking as needed, walking the dog, stair climbing, house or yard work, exercising.)
- How do you spend your working day and leisure time?
- What types of physical activity do you enjoy? How often do you do them?
- How many hours of TV do you watch every day? How many hours are you at a computer or desk every day?

- Are you currently exercising regularly?

Answer: yes (ask the following questions):

- How many days per week do you exercise?
- How many minutes per exercise session?
- What type of activity do you engage in?
- What is the intensity of your exercise (low, moderate, vigorous)?

Answer: no (ask the following questions):

- How do you feel about/what are your thoughts on initiating/are you ready to initiate physical activity?
 - What are the barriers to initiating physical activity for you (i.e., access to gym, access to safe environment, injuries or physical limitations)?
 - What are the benefits of physical activity for you?
 - Describe your previous experiences with exercise?
 - Do you have any negative feelings about exercise or have you had any bad experiences with exercise?
 - Do you have a support system to encourage you to exercise or exercise with you?
 - How much time are you able to commit to exercise?
-

Additionally, the STOP-Bang (STOP-Bang is an acronym for the eight criteria included in the tool) questionnaire (94), which has been widely validated as a clinical risk assessment tool for sleep apnea, can be used (Table 8).

Question 5: What are Future Clinical Research Directions in Assessing the Value of Taking a Weight History?

Much of the evidence supporting the value of taking a weight history has been extrapolated from population cohort studies, surveys of health care providers, and expert opinion. Prospective, clinically based, and pragmatic studies are needed. Future clinical research directions may be grouped into three categories, as follows:

1. The utility of identifying a weight gain pattern to predict outcomes
 - Characterize the importance of the onset, trajectory, and triggering factors for predicting treatment responsiveness and health outcomes, and their predictive value in determining a subtype or the severity of obesity. For example, do individuals with early onset obesity develop more severe obesity or more weight-related comorbidities than those who develop adult onset obesity, and does this offer guidance on treatment options?
 - Identify obesity phenotypes and biopsychosocial and behavioral patterns to predict treatment responsiveness.
 - Further characterize the accuracy of recalled body weight and associated factors that affect its reliability.

TABLE 6 Practical assessment of stress

Perceived Stress Scale-4

For each of the four questions a range of scores is assigned based from 0 = never to 4 = very often.

Reverse scores for questions 2 and 3 like this: 0 = 4, 1 = 3, 2 = 2, 3 = 1, 4 = 0. Now add up scores for each item to get a total score which varies between 0 and 16.

1. In the last month, how often have you felt that you were unable to control the important things in your life?
2. In the last month, how often have you felt confident about your ability to handle your personal problems?
3. In the last month, how often have you felt that things were going your way?
4. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

TABLE 7 Practical assessment of sleep

- What time do you usually go to bed?
- What time do you usually wake up in the morning?
- Do you fall asleep within 30 minutes of lying on the bed?
- How many times do you wake up at night?
- What is the reason you wake up at night?
- Do you feel well rested in the morning?
- How many times have you used sleep aids in the past month?

TABLE 8 Assessing sleep apnea

STOP-Bang questionnaire for adults

Each “yes” gets 1 point, “no” gets 0 points:

0-2 points, low risk of obstructive sleep apnea

3-4 points, moderate risk

5-8, high risk

- Do you SNORE loudly (louder than talking or loud enough to be heard through closed doors)?
- Do you often feel TIRED, fatigued, or sleepy during daytime?
- Has anyone OBSERVED you stop breathing during your sleep?
- Do you have or are you being treated for high blood PRESSURE?
- BMI more than 35 kg/m²?
- AGE over 50 years old?
- NECK circumference > 17 inches (male) or > 16 inches (female)?
- GENDER: Male?

2. Effective implementation of the weight history

- Explore how to take efficient and effective weight histories in the primary care setting.
- Develop and validate short assessment tools that may augment or complement taking a weight history, such as a pre-visit questionnaire.
- Identify opportunities for using electronic medical records to facilitate and document taking a weight history, such as smart sets (order sets that provide simultaneous ordering of all necessary components associated with effective clinical care), dot phrases (automated ability to have preformatted phrases and statements both for documentation and for patient education), or embedded questionnaires.
- Assess clinical management decisions in response to information learned through taking a weight history. For example, does a Best Practice Alert triggered by an elevated BMI facilitate the delivery of obesity care, or if a known weight-gain-promoting medication is identified, do clinicians act on this information by decreasing the dose or discontinuing the medication?

3. Structure or characteristics of the weight history

- Assess the value of using a weight graph as a tool in the development of treatment plans.
- Identify which questions from the weight history are most useful for clinical assessment and management.
- Develop an efficient and informative questionnaire to structure the weight history.
- Develop and evaluate questionnaires to assess patient preferences regarding weight-, diet-, and behavioral-related lifestyle changes, especially as related to adherence.
- Explore patient perceptions of the weight history process, perceived weight stigmatization, and motivational factors.

Conclusion

Weight history is an essential component of the medical history for patients presenting with overweight or obesity. There are strong and emerging data that demonstrate the importance of life stage, duration of exposure to obesity, maximum BMI, and GBTM in predicting risk

for increased morbidity and mortality. Psychosocial, behavioral, and cognitive factors are associated with weight change. Consideration of these and other patient-specific factors may improve risk stratification and aid in clinical decision-making for screening, counseling, and management. Discussion of these personal factors is consistent with shared decision-making and patient-centered care. However, much is unknown. To date, there have been no studies that have formally evaluated the utility of taking a weight history or how to best incorporate a weight history into the traditional medical encounter. The committee has outlined several areas for future clinical research that will aim to answer these questions. **O**

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