

## AAACE Consensus Statement

## 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



Karl Nadolsky, DO, FACE<sup>1</sup>, Brandi Addison, DO, FACE<sup>2</sup>,  
 Monica Agarwal, MD, MEHP, FACE<sup>3</sup>, Jaime P. Almandoz, MD, MBA, FTOS<sup>4</sup>,  
 Melanie D. Bird, PhD, MSAM<sup>5</sup>, Michelle DeGeeter Chaplin, PharmD, BCACP, CDCES<sup>6</sup>,  
 W. Timothy Garvey, MD, MACE<sup>3</sup>, Theodore K. Kyle, RPh, MBA<sup>7</sup>

<sup>1</sup> Michigan State University College of Human Medicine, Grand Rapids, Michigan

<sup>2</sup> South Texas Endocrinology and Metabolism Center, Corpus Christi, Texas

<sup>3</sup> University of Alabama at Birmingham, Birmingham, Alabama

<sup>4</sup> University of Texas Southwestern Medical Center, Dallas, Texas

<sup>5</sup> American Association of Clinical Endocrinology, Jacksonville, Florida

<sup>6</sup> Wingate University School of Pharmacy, Hendersonville, North Carolina

<sup>7</sup> ConscienHealth, Pittsburgh, Pennsylvania

## ARTICLE INFO

## Article history:

Received 13 February 2023

Received in revised form

17 March 2023

Accepted 18 March 2023

Available online 4 May 2023

## Key words:

adiposity-based chronic disease

BMI

obesity

stigma

weight bias

## ABSTRACT

**Objective:** To focus on the intersection of perception, diagnosis, stigma, and weight bias in the management of obesity and obtain consensus on actionable steps to improve care provided for persons with obesity.

**Methods:** The American Association of Clinical Endocrinology (AAACE) convened a consensus conference of interdisciplinary health care professionals to discuss the interplay between the diagnosis of obesity using adiposity-based chronic disease (ABCD) nomenclature and staging, weight stigma, and internalized weight bias (IWB) with development of actionable guidance to aid clinicians in mitigating IWB and stigma in that context.

**Results:** The following affirmed and emergent concepts were proposed: (1) obesity is ABCD, and these terms can be used in differing ways to communicate; (2) classification categories of obesity should have improved nomenclature across the spectrum of body mass index (BMI) using ethnic-specific BMI ranges and waist circumference (WC); (3) staging the clinical severity of obesity based on the presence and severity of ABCD complications may reduce weight-centric contribution to weight stigma and IWB; (4) weight stigma and internalized bias are both drivers and complications of ABCD and can impair quality of life, predispose to psychological disorders, and compromise the effectiveness of therapeutic interventions; (5) the presence and of stigmatization and IWB should be

**Abbreviations:** AAACE, American Association of Clinical Endocrinology; ABCD, adiposity-based chronic disease; BMI, body mass index; IWB, internalized weight bias; SDoH, social determinants of health; WC, waist circumference.

Address correspondence to the American Association of Clinical Endocrinology, 7643 Gate Parkway, Suite 104-328, Jacksonville, FL 32256.

Email address: [publications@aaace.com](mailto:publications@aaace.com).

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<https://doi.org/10.1016/j.eprac.2023.03.272>

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assessed in all patients and be incorporated into the staging of ABCD severity; and (6) optimal care will necessitate increased awareness and the development of educational and interventional tools for health care professionals that address IWB and stigma.

**Conclusions:** The consensus panel has proposed an approach for integrating bias and stigmatization, psychological health, and social determinants of health in a staging system for ABCD severity as an aid to patient management. To effectively address stigma and IWB within a chronic care model for patients with obesity, there is a need for health care systems that are prepared to provide evidence-based, person-centered treatments; patients who understand that obesity is a chronic disease and are empowered to seek care and participate in behavioral therapy; and societies that promote policies and infrastructure for bias-free compassionate care, access to evidence-based interventions, and disease prevention.

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## Introduction

Obesity is a complex, multicausal, chronic disease with variable clinical phenotypes defined by abnormal or excessive adiposity. Its pathophysiology involves a state of enduring positive energy imbalance due to complex neuroendocrine and behavioral dysregulation of the body's adipose "set point" and can impair physical and mental health. In addition, the disease is associated with pervasive stigma and bias, which in turn perpetuate the disease.<sup>1-5</sup> Stigma and internalized weight bias (IWB) are caused by multifactorial biopsychosocial determinants that are intimately interwoven within the diagnosis of obesity and the risks for individuals (Box 1).

In 2014, the American Association of Clinical Endocrinology (AACE) published an "Advanced Framework for a New Diagnosis of Obesity as a Chronic Disease"<sup>6</sup> after a consensus conference involving a broad array of professional organizations and other stakeholders in society with a vested interest in obesity. The multidisciplinary discussion gave rise to an emergent concept that a new medically meaningful and actionable diagnosis of obesity beyond body mass index (BMI) was needed that reflected the impact of elevated or abnormally distributed adiposity on health. This was followed by the "Comprehensive Clinical Practice

Guidelines for the Medical Care of Patients with Obesity," which recommended 2 components in the diagnosis: (1) an anthropometric component using BMI as a screening tool with subsequent clinical confirmation of excess adiposity based on examination along with waist circumference (WC) as an indicator of central adiposity reflecting cardiometabolic risk, and (2) a clinical component comprising the risk, presence, and severity of obesity complications. This guideline advocated a complications-centric approach to care in which intensity of therapy was based on disease severity/staging and treatment goals were defined by sufficient weight loss to prevent and ameliorate complications rather than loss of a given amount of weight.<sup>7</sup>

In 2017, AACE followed up with a position statement for a new diagnostic term for obesity, adiposity-based chronic disease (ABCD), which explicitly identified the chronicity of the disease and the underlying adiposity driving the pathophysiology and complications that confer morbidity and mortality.<sup>8</sup> The European Association for the Study of Obesity followed suit in 2019 with their position statement on ABCD as a diagnostic term in line with their previous proposal to improve the International Classification of Diseases diagnostic criteria beyond BMI classification. Their goal was to emphasize the etiology, degree of adiposity, and severity of health risks due to the physical forces of adipose mass and immune-endocrine metabolic consequences of adiposopathy more appropriately.<sup>9,10</sup>

The paradigm shift—from a weight/BMI-centric obesity diagnosis in which the emphasis is purely on weight loss to clinically based ABCD that aims to improve health through prevention and treatment of complications—underscores the fact to patients and health care professionals that this is a chronic disease and not a lifestyle choice. Clearly, this has the potential to reduce bias and stigma and to promote access to evidence-based care. Conversely, stigma and IWB can be perpetuated by the sole use of BMI as the defining characteristic in the public forum and for diagnosis in health care systems, which does not reflect the impact of excess adiposity on health or a comprehensive understanding of disease pathophysiology. In contrast, ABCD indicates what clinicians are treating (adiposity-based = abnormalities in the mass, distribution, and function of adipose tissue) and why they are treating it (chronic disease associated with complications).

To directly address the global problem of bias and stigma, an international multidisciplinary group of experts, which included representation from a broad coalition of scientific organizations, convened to develop a joint consensus statement for ending the stigma of obesity. This collaboration produced several statements and recommendations published in 2020.<sup>11</sup> That same year, the Canadian Obesity Clinical Practice Guideline provided evidence-based recommendations to reduce weight bias in obesity management, practice, and policy by emphasizing that people with

### Box 1

#### Key Definitions<sup>a</sup>

- **Weight bias** = negative ideologies associated with excess body weight
- **Weight stigma** = thoughts and acts of discrimination toward individuals due to their weight and size and a result of weight bias
- **Internalized weight bias** = when a person applies negative weight stereotypes (bias) to themselves and engage in self-devaluation
- **Implicit weight bias** = unconscious bias toward a person who has obesity, beliefs or attitudes outside of an individual's awareness and control
- **Explicit weight bias** = awareness of bias and intentionally behaving negatively toward a person who has obesity

<sup>a</sup> Adapted with permission from [www.worldobesity.org](http://www.worldobesity.org); Rubino F, Puhl RM, Cummings DE, et al. Joint international consensus statement for ending stigma of obesity. *Nature Medicine*.2020;26(4):485–497. This article is licensed under the Creative Commons CC BY.

obesity face substantial bias and stigma contributing to morbidity/mortality regardless of weight or BMI.<sup>12</sup> To further its work in addressing obesity stigma and weight bias, AACE convened a consensus conference on obesity to focus on the intersection of perception, diagnosis, stigma, and bias of obesity. To aid in advancing health care professionals in the reduction of bias and stigma in the context of obesity diagnosis, participants established emergent concepts, which were used to develop a roadmap with actionable, pragmatic clinical proposals to combat obesity stigma and bias in clinical practice and beyond.

## Synopsis of Affirmed and Emergent Concepts

### Affirmed Concepts

- Obesity is a complex disease caused by multifaceted pathophysiology associated with internalized weight bias and stigma.
- While obesity is not a lifestyle choice, lifestyle modifications are the critical foundation of treating ABCD and its complications. This requires alterations in diet and physical activity, education, behavioral therapy, and supportive care from health care teams.
- A BMI-centric diagnosis of obesity is not appropriate, on its own, for individual patient care and should be considered in the context of a clinical examination plus further diagnostic evaluation for complications as necessary for patient-centered care.
- A complication-centric staging of ABCD can provide personalized interventions that match disease severity and the intensity of therapy.

### Emergent Concepts

- Classification categories of obesity should include improved nomenclature across the spectrum of BMI using ethnic-specific ranges for BMI and WC.
- Complication-centric staging of ABCD based upon the spectrum of disease severity shifts the conceptualization of this disease away from a weight-centric emphasis and has the potential to reduce stigma and IWB.
- Weight stigma and IWB are both drivers and complications of obesity/ABCD in a bidirectional manner; therefore, patients with ABCD should be screened for IWB.
- As complications of ABCD, the presence of weight stigma and IWB should be incorporated into the staging of disease severity.
- Weight stigma and IWB can lead to or exacerbate psychological disorders such as depression, anxiety, and disordered eating; patients with ABCD should be screened for these psychological disorders.
- Focusing on a clinical response to obesity therapy that includes both percent weight-loss goals and alleviation of obesity-related complications rather than weight loss per se is consistent with the medical model for treatment of a chronic disease and may help reduce weight stigma and IWB.

### Methodology

A consensus conference was convened by AACE in May 2022 that brought together thought leaders from multiple segments of society, including representatives from professional and patient advocacy organizations (see Acknowledgments). Participants discussed key aspects of the growing obesity epidemic including the role of implicit and explicit bias, the interplay of biopsychosocial factors, and the potential for the use of newer terminology and classification systems to help reduce weight stigma and bias in the health care setting. The goal of the conference was to achieve

consensus from the group around 3 key areas: (1) perception and diagnosis of obesity, (2) weight stigmatization and bias and impacts on mental health, and (3) training gaps and needs for health care professionals to address weight stigma and bias.

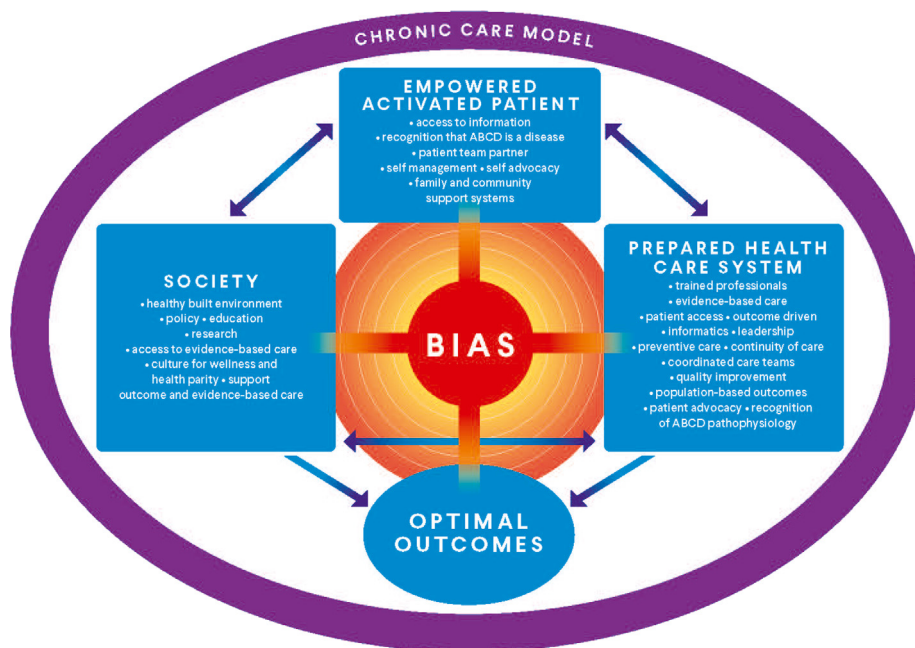
Before attending the conference, participants completed a survey asking them to respond in agreement or disagreement with 18 statements related to weight stigma, bias, and obesity staging/classification. Respondents were asked whether they strongly agreed, agreed, neither agreed nor disagreed, disagreed, or strongly disagreed with the statements. Overall, 84 participants completed the survey. Two-thirds of the respondents identified as AACE members. Most respondents identified as endocrinologists (n = 59), and others identified as nonendocrinologist physicians (n = 10) and primary care physicians (n = 4). The remaining respondents identified as advanced practice providers, pharmacists, and patient representatives. There was diversity in geography, practice setting, years in practice, and patient populations. The survey results were presented at the conference to facilitate additional discussion and to provide a foundation for this consensus statement.

A writing task force of AACE members was empaneled and included practicing endocrinologists, obesity medicine specialists, a pharmacist, and a patient representative. The task force reviewed the current evidence, the survey results, and the discussions from the consensus conference and developed a draft document. Conference participants from external organizations were invited to review the draft document and were asked to confirm consensus with the presented concepts. The consensus statement was reviewed by AACE's Clinical Practice Guideline Oversight Committee and was approved by the Board in February 2023.

### Weight Bias and Chronic Care for Obesity

A primary concept apparent from the consensus conference was that the individual and societal costs of ABCD can only be ameliorated within the context of an effective chronic disease care model (Fig. 1).<sup>1,7</sup> Optimal outcomes for patients with ABCD necessitate interactions between empowered informed patients who are activated to partner with the health care team and a prepared health care system with professionals, procedures, and infrastructure that provide full access to evidence-based care.

In addition, society must actively promote patient empowerment and realization of health care systems that deliver optimal treatment and prevention of ABCD through their support of policies, education, research, and access to care. Weight bias and stigmatization adversely disrupt an effective chronic care model at all 3 levels of patient, health care system, and society.<sup>4-6,13</sup> IWB results in self-blame, low self-esteem, and mental health conditions that thwart the ability of patients to become informed and empowered to seek care, adhere to care, and act as health care partners. Weight bias within health care systems and their personnel results in unempathetic care and shaming of patients and impedes the development of and access to effective care programs, with the notion that ABCD is a lifestyle choice and not a chronic disease. Finally, explicit bias prevalent in society compounds the shaming and stigmatization of patients and impedes the development of policies and programs addressing the education, research, environments, and health care access required to support the chronic care model. It is incumbent upon society to provide regulatory and legislative measures that ensure access of patients to therapies of proven benefit. Therefore, weight bias prevents the establishment of a chronic care model for ABCD that must become operational as an integral component of the health care system and embraced by the larger society if it is to benefit patients and public health.



**Fig. 1.** Chronic care model of obesity. Weight bias has a broad-based effect to disrupt a chronic care model for adiposity-based chronic disease (ABCD). Weight bias impairs obesity care and treatment outcomes by impeding multiple processes that must work in concert to produce optimal clinical outcomes. Weight bias reduces the ability of patients to be empowered, informed, and activated to function as a health care team partner, renders the health care system ill-prepared to provide full access to evidence-based therapy and empathetic care, and imperils the ability and inclination of society to support infrastructure and policies that ensure interactions between empowered activated patients. Adapted from Garvey et al.<sup>7</sup> Reprinted with permission from AACE.

### Biopsychosocial Model of Bias—Clinical and Patient Perspectives

Obesity is currently the most stigmatized chronic disease. At the turn of the 20th century, people with obesity were considered a spectacle and stigmatized. One hundred years later, people with obesity still struggle with stigma and weight bias. Health risks of obesity were noted centuries ago by Greek physician Hippocrates, and corpulency was ranked a disease in the 1600s, yet obesity was only recognized as a disease state by AACE in 2012<sup>14</sup> and subsequently by the American Medical Association in 2013<sup>15</sup>—a disease that requires prevention and treatment efforts. The cultural ideal of slimness and society fetishizing thinness has stigmatized people with obesity for decades and disproportionately impacts women, Black, Indigenous, and people of color, and gender-diverse individuals in the United States.<sup>16–18</sup> Unfortunately, weight stigmatization is pervasive and has increased over time.<sup>17,19</sup>

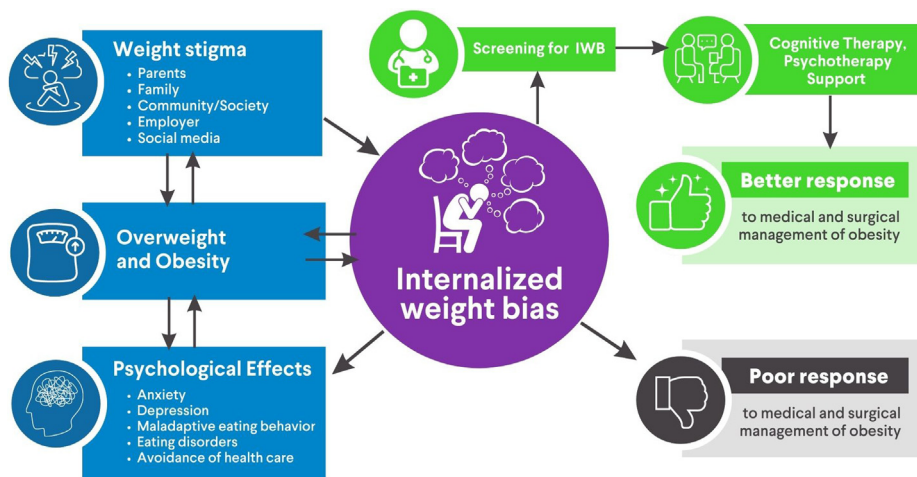
Weight bias is the result of negative ideologies related to increased weight that lead to social rejection and devaluation (stigma); it is directed at those who do not align with the social ideals of body weight and shape. Weight stigma triggers unfavorable physiological and behavioral changes associated with poor health.<sup>19</sup> Weight bias and stigma are detrimental to health and are related to higher morbidity and all-cause mortality.<sup>20</sup> Furthermore, weight bias and stigma exacerbate health disparities. People with obesity are exposed to weight bias in the workplace, educational and health care settings, social media, and interpersonal relationships.<sup>21</sup> Despite recognizing obesity as a disease, weight bias is prevalent and pervasive in health care settings among health care professionals, trainees, and students. Health care professionals have shown explicit and implicit weight bias.<sup>22</sup> Implicit bias is automatic, unconscious, and represents introspectively unidentified or inaccurately identified traces of past experiences that mediate negative attitudes, thoughts, and actions.<sup>23,24</sup> In contrast, explicit bias is a conscious mode exemplified by awareness and

negative behavior toward a person based on a specific characteristic (eg, weight, race/ethnicity/gender identity). In one study, implicit weight bias decreased but explicit weight bias increased during medical school.<sup>25</sup> In health care systems, implicit and explicit biases held by clinicians create a vicious cycle in which care is often delayed or denied, further contributing to the progression and complications of obesity.<sup>26</sup> Stigma and discrimination toward patients with obesity are pervasive among both health care professionals and society in general and pose consequences for the psychological and physical health of patients.

People with obesity who experience weight stigma and discrimination, including being negatively stereotyped, may internalize these negative societal stereotypes and attributes known as IWB and self-derogate because of excess body weight. As shown in Figure 2, IWB is associated with negative psychosocial consequences and psychological distress.

There is a strong association between IWB and psychosocial correlates such as disordered eating, depression, poor mental health outcomes, and impaired quality of life.<sup>27</sup> In one survey, 52% of respondents with obesity strongly agreed with statements related to IWB in their own lives, suggesting that a high proportion of people with obesity are at risk for IWB when generalized to larger populations.<sup>17</sup> These respondents had lower levels of education and income, highlighting the role of social determinants of health in fostering IWB. IWB is associated with higher attrition within the medical clinic setting and lower engagement with obesity medicine specialists.<sup>28</sup>

Furthermore, there is a strong association between weight bias and IWB with poor psychological, behavioral, and medical sequelae in patients who have received bariatric surgery.<sup>29</sup> Thus, medical and surgical interventions are potentially less effective in people with IWB. Therefore, it is important to screen people with obesity to identify IWB because mitigating IWB would predictably improve adherence to medical management of obesity and surgical outcomes. Validated tools such as the Weight Self-Stigma



**Fig. 2.** Impact of internalized weight bias (IWB) in the care of persons with obesity. This infographic highlights the negative impacts of IWB and the importance of screening and treating IWB to improve outcomes in persons with obesity.

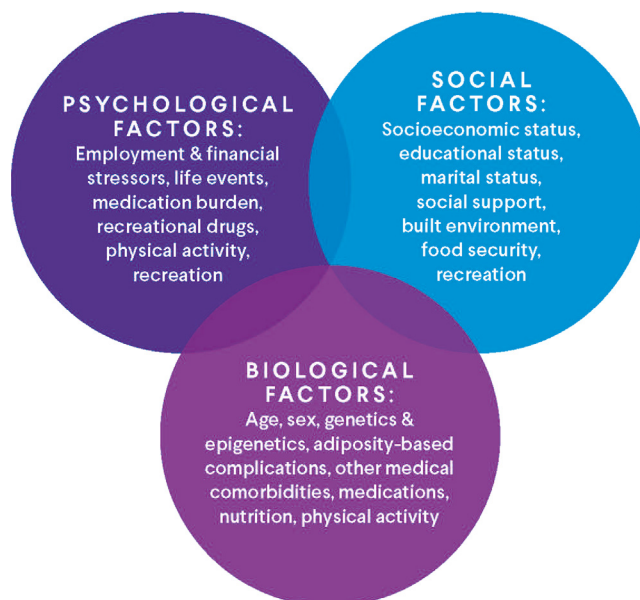
Questionnaire (WSSQ) and the Weight Bias Internalization Scale are available for measuring IWB.<sup>21,30,31</sup> Engel’s biopsychological model of health and illness is a model that details the complex interconnection between the biological, psychological, and social factors of diseases and is highly applicable to obesity/ABCD (Fig. 3).<sup>32</sup> The interactions between the biological, psychological, and social factors play a significant role in the creating, driving, and sustaining chronic diseases such as obesity/ABCD.<sup>33</sup> This concept was strongly supported by conference participants with more than 90% in agreement that acknowledging this biopsychosocial model as operative in obesity would increase awareness and acceptance of IWB as a complication of obesity.

**Weight Bias, Stigmatization, and AACE Guidelines for Diagnosing/Treating ABCD**

The 2016 AACE obesity treatment guideline was the first to explicitly recommend a complications-specific approach to obesity

management.<sup>7,34</sup> This guideline recommended both anthropometric (eg, BMI) and clinical (ie, presence and severity of complications) components to the diagnosis,<sup>6</sup> a simple staging based on the severity of ABCD complications, and the prevention or treatment of complications as the goal of therapy rather than the loss of a certain amount of weight.<sup>7</sup>

The classification of obesity has historically been based on categories of BMI that were correlated with adiposity and morbidity/mortality.<sup>35–43</sup> Anthropometric assessment and classification is further refined by measuring the WC of individuals to delineate adipose distribution, which correlate with cardiometabolic risk due to visceral and ectopic fat.<sup>41,44–49</sup> While BMI can be used for obesity screening,<sup>7,50</sup> it is not an optimal diagnostic tool at the individual level because it does not distinguish between fat and lean muscle nor does it reflect the impact of BMI on health or presence of complications.<sup>51</sup> In addition, normative values of BMI may differ across racial and ethnic groups, further limiting its utility. Conference participants



**Fig. 3.** Biopsychosocial model for obesity/adiposity-based chronic disease. Adapted from Engel.<sup>32</sup> Reprinted with permission from the American Association for the Advancement of Science.

discussed these issues and determined that BMI should not be used for the diagnosis of obesity. Despite broad agreement that BMI is not appropriate for individual diagnosis of obesity by itself, it is pervasively used by health care professionals and in public dialogue and has been extensively studied in population research. This was a key topic at the consensus conference, at which 64% of survey respondents perceived BMI as intertwined with many forms of bias contributing to, and maintained by, obesity stigma.<sup>52</sup> This is further conflated by BMI-based terms such as overweight and morbid, which do not convey relevant information and may create misinterpretation.

With respect to bias and clinical severity of ABCD, it is important to consider 2 aspects of the “2016 AACE Guidelines for the Medical Care of Patients with Obesity.” The first pertains to the staging system that places patients into 3 categories designed to aid in clinical decision-making regarding the mode and intensity of therapy, namely, stage 0 (no complications), stage 1 (mild to moderate complications), and stage 2 (severe complications). The AACE guideline indicated that ABCD without current complications (stage 0) requires secondary prevention with the goal of treatment to reduce risk of emergence of future complications because of the progressive nature of the disease.<sup>7</sup> However, thoughts were proffered at the consensus conference that using the term stage 0 might engender complacency toward treatment or suggest that excess body fat does not constitute a disease, even if complications were not immediately apparent, resulting in a potential delay in initiating interventions for secondary prevention. In addition, individuals in this stage may be at increased risk for adiposity-based malignancies and other types of cancer.<sup>53,54</sup> Studies have shown this risk is decreased with treatments resulting in weight reduction.<sup>55-57</sup> Therefore, given the potential implications of the term stage 0, consensus conference participants agreed that ABCD without complications would preferably be termed stage 1, with mild to moderate complications stage 2, and with severe complications stage 3. This reformulation in disease stage designation is shown in Table 1.

The second consideration pertains to the adverse impact of bias and stigmatization on quality of life in patients with ABCD and as impediments to successful treatment.<sup>58</sup> There was strong consensus at the conference that assessment for bias and stigmatization and for mental health concerns should be performed for patients with obesity (93% agreed/strongly agreed). The approach taken in the 2016 AACE obesity guideline was to review evidence regarding those complications that could be prevented or ameliorated with therapeutically sufficient weight loss in individual

patients.<sup>7</sup> The guideline did not offer complication-specific treatment recommendations when there was insufficient evidence that weight loss could improve particular outcomes. For example, depression commonly affects patients with ABCD and can compromise a treatment plan; however, the guideline offered no recommendations for weight loss to address depression because of a lack of evidence that depression is a weight loss–responsive complication. This does not detract from the fact that depression, anxiety, and other mental health conditions are complications of ABCD. This also applies to IWB and stigmatization. While the mitigation of IWB can enhance effectiveness of a weight-loss treatment plan,<sup>59</sup> there is little current evidence that weight loss alone can reduce IWB. The observation that patients can experience enhanced employment prospects after bariatric surgery could indicate the implicit and explicit bias toward people with obesity reduces the employment opportunities before weight loss<sup>60</sup>; however, more research is needed.

At this point, IWB and stigmatization should be explicitly recognized as complications of ABCD that can impair health and quality of life and compromise treatment efficacy. These same considerations apply to psychological disorders.<sup>61</sup> While weight loss might not in itself ameliorate bias and stigmatization or psychological complications, these issues must be addressed in all patients, become part of an individualized treatment plan, and remedied in efforts to improve quality of life for patients and to enhance the effectiveness of weight-loss therapies. In addition, health care professionals will need to consider social determinants of health (SDoH) in making lifestyle and treatment recommendations because SDoH may render certain interventions unattainable, impractical, or unfeasible. Furthermore, the severity of bias and stigmatization and psychological disorders as complications of obesity, or for SDoH as mitigating circumstances affecting care, may be operative independent of the severity of cardiometabolic or biomechanical physical complications. Management of ABCD will need to extend beyond weight-loss management using lifestyle, medications, or metabolic/bariatric surgery to include a variety of other modalities, both prescription and behavioral, that address bias and stigmatization, behavioral health, and accommodate SDoH. Based on the discussions at the consensus conference, Table 1 shows a revised set of proposed criteria for staging ABCD that for the first time incorporates bias and stigma as well as the psychological overlay of the disease into the AACE staging system of ABCD severity, together with the physical complications (ie, cardiometabolic and biomechanical) that can be improved by weight-loss therapy.

**Table 1**  
Incorporation of Bias and Stigmatization, Psychological Health, and Social Determinants of Health in the Staging of ABCD Severity<sup>7</sup>

Previous Stage <sup>a</sup>	Recommended Stage	
0	1	No known cardiovascular, biomechanical, or other physical complications of ABCD. Increased risk of complications (eg, cancer) that may be reduced by weight loss. AND/OR Internalized weight bias and stigmatization, psychological conditions, and social determinants of health may be operative to a degree that do not have adverse effects on quality of life or treatment but may require management in an individualized care plan.
1	2	One or more mild to moderate ABCD complications plus an increased risk of other complications. AND/OR Internalized weight bias and stigmatization, psychological conditions, or social determinants of health are present and have adverse effects on quality of life or could potentially impair the ABCD treatment plan. These issues should be considered in devising an effective individualized treatment plan.
2	3	At least one severe ABCD complication plus an increased risk of other complications. AND/OR Internalized weight bias and stigmatization, psychological conditions, or social determinants of health are present and are having pronounced adverse effects on quality of life or may render weight-loss treatment plans ineffective or harmful. Intervention to address and remedy these issues must be enacted in the interest of patient well-being and to ensure effectiveness of weight-loss treatment.

ABCD = adiposity-based chronic disease.

<sup>a</sup> Previous staging outlined in the 2016 AACE Comprehensive Practice Guidelines for Medical Care of Patients with Obesity.<sup>7</sup>

### Focusing on Clinical Outcomes to Mitigate Stigma/Bias in Obesity Treatment

Weight stigma and IWB in people with ABCD can be both a driving factor and a complication of the disease. In this consensus statement, the task force proposes the inclusion of weight stigma and IWB into the staging system of ABCD severity. The assessment of weight stigma and IWB is not a standard practice in many health care settings, which include primary care and endocrinology offices. In any disease state, the clinical response to interventions should be categorized in a standardized manner. To facilitate this, weight stigma and IWB should be assessed in people with ABCD to ensure that these factors do not negatively impact patient engagement, treatment efficacy, health outcomes, or quality of life. Validated tools such as the Weight Bias Internalization Scale and the Weight Self-Stigma Questionnaire are available.<sup>30,31</sup> Tracking patient-reported weight stigma and IWB can inform the health care team to create a more individualized approach to treating ABCD. This is also helpful for clinical monitoring of treatment efficacy and research.

The 5As tool is a motivational interviewing technique that was originally designed for smoking cessation but is also used and recommended for treating other chronic conditions like obesity (Box 2).<sup>62</sup> In the treatment of ABCD, the 5As technique has been shown to increase behavioral change and patient motivation.<sup>63</sup> By using motivational interviewing tools that foster patient autonomy and partnership, health care providers may improve the quality of their patient interactions and therapeutic responses. For example, by using the 5As tool, health care professionals can evaluate patients for IWB and stigmatization when they Ask permission and Assess health status and complications. When clinicians Advice and Agree on treatment plans, there is an opportunity to set individualized goals for treating ABCD and complications instead of empiric weight-loss recommendations. When health care professionals Assist in the continuous process of weight management, they highlight that obesity is ABCD, while empowering patients with knowledge and tools to achieve their individualized health and weight goals.

Health care provider emphasis on “excess weight” may contribute to weight stigma and IWB among people with ABCD complications, like type 2 diabetes mellitus, because approximately 50% report experiencing weight bias in a health care setting.<sup>64</sup> Previously, obesity/ABCD treatment success has been quantified by reductions in body weight with a goal of  $\geq 5\%$  to 10% weight loss proposed.<sup>65</sup> Consensus conference participants thought this emphasis on weight loss alone contributed to weight stigma and IWB.<sup>53,54</sup> The use of anthropometrics (such as percent weight loss,

#### Box 2 5A's for Obesity/ABCD<sup>a</sup>

ASK if you can discuss weight and the health impact of ABCD  
 ASSESS health status and complications  
 ADVISE on treatment options based on the severity of ABCD  
 AGREE on treatment plan and weight-loss goals  
 ASSIST in the continuous process of weight management with reassessment of goals and treatment options

<sup>a</sup> Adapted with permission from 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*. Jan 2013;59(1):27-31.

BMI classification category, body composition, and WC) should be assessed and considered as surrogates for clinical benefit (in essence, a biomarker).<sup>66</sup> However, actual clinical improvements such as remission of complications, improvements in patient-reported outcomes, and reductions in weight stigma and IWB constitute the actual goals of therapy. In other words, treating ABCD to prevent or ameliorate complications is recognized as the primary goal of therapy.<sup>67-69</sup>

To this end, clinicians can measure the success of therapies with changes in ABCD-related cardiometabolic markers like hemoglobin A1c, blood pressure,<sup>70</sup> lipids,<sup>71</sup> nonalcoholic fatty liver disease fibrosis risk,<sup>72</sup> and expected cardiovascular benefits and improvement in mental health conditions.<sup>73-75</sup> Similarly, clinical outcomes can be assessed for adiposity-based cardiometabolic reproductive disorders, such as polycystic ovary syndrome and functional male secondary hypogonadism,<sup>76-81</sup> in addition to biomechanical complications of obesity that include obstructive sleep apnea, gastroesophageal reflux disease, urinary incontinence,<sup>82-84</sup> and knee osteoarthritis.<sup>85,86</sup> It is important to note that current antiobesity therapies (medications, devices, and surgeries) are capable of achieving the  $>5\%$  to 20% total body weight loss,<sup>66,87-90</sup> which can improve health by preventing or ameliorating a broad array of ABCD complications.<sup>88</sup>

### Consensus Recommendations

Weight stigma and IWB impair quality of life for patients with ABCD and constitute complications of this disease. At the same time, stigma and IWB exacerbate the severity of ABCD as a disease and compromise the efficacy of ABCD treatment.

To address the impact of weight stigma and IWB, AACE puts forth the following consensus recommendations:

- Patients with ABCD should be screened for the presence and degree of stigmatization and IWB; the Weight Self-Stigma Questionnaire and the Weight Bias Internalization Scale are validated tools that can be used to assess stigmatization and IWB.<sup>21,30,31</sup>
- As complications of ABCD, the presence and degree of weight stigma and IWB should be incorporated into the staging of ABCD severity.
- IWB and stigmatization can lead to or exacerbate psychological disorders such as depression, anxiety, stress, and disordered eating; patients with ABCD should be screened and treated for these psychological issues. Mental health conditions and social determinants of health should also be incorporated into the staging of ABCD severity.
- Health care professionals and organizations should implement policies and actions to reduce the impact of weight bias in patient care including, but not limited to, implicit bias training for staff, obesity education of health care professionals to reduce explicit bias, use of person-first policies and language in treatment plans and health records, and adoption of the new proposed ABCD nomenclature for classification and staging of obesity along with clinical goals of therapy.
- Health care professionals and organizations should advocate for improved access to evidence-based treatment modalities and increased research into practice-based solutions to limit the impact of IWB on management of ABCD.

### Conclusion

Obesity is ABCD with adverse health complications, including cardiometabolic, biomechanical, psychological, and oncologic

disease risk. ABCD is also characterized by pervasive stigmatization and weight bias, both internalized and externally directed, which operate in a bidirectional manner to both exacerbate and complicate the disease. The aim of this consensus statement is to provide health care professionals with pragmatically actionable steps to mitigate the harmful consequences of weight bias and stigma at the intersection of diagnosis and management in a holistic biopsychosocial manner.

There was unanimous consensus that pervasive weight bias and stigma confound, and are exacerbated by, diagnoses relying exclusively on BMI and treatment goals that involve a sole emphasis on weight loss. Modulating the clinical nomenclature is recommended to minimize stigma and bias engendered by a BMI-centric approach to diagnosis and care. Also proposed is an approach for integrating weight bias and stigmatization, psychological disorders that can be exacerbated by bias, and SDoH into the AACE staging paradigm for ABCD severity to guide decision-making around individualized care plans. In addition, as shown in [Figure 1](#), the individual and societal costs of ABCD can only be ameliorated within the context of an effective chronic disease care model, and optimal outcomes require health care systems that are prepared to partner with empowered and informed patients. These health care systems should provide training, education, and resources so that the health care professionals can provide patient-centered and evidence-based care that is free of bias and stigmatization. Finally, society, including payers and policymakers, should support policies, education, research, and access to care to limit bias and stigma faced by individuals with obesity/ABCD.

### Review Process

Drafts of this consensus statement were reviewed and approved by all task force members, the AACE Clinical Practice Guidelines Oversight Committee, the AACE Board of Directors, and peer reviewers for *Endocrine Practice*.

### Funding

This consensus statement on obesity stigma and weight bias was developed with financial support from the American Association of Clinical Endocrinology (AACE). All members who served on this AACE task force completed work on the manuscript electronically and met via video conferences. AACE received no outside funding for the development of this consensus statement. Volunteer authors on this task force received no remuneration for their participation in development of this consensus statement. Support for the 2022 AACE Obesity Consensus Conference – Improving Obesity Outcomes Together was provided by Novo Nordisk but the funder had no role in development of this consensus statement.

### Panel Composition

The Task Force was empaneled in accordance with AACE's COI Policy. This consensus statement was developed by a group of credentialed medical professionals in the fields of endocrinology, pharmacology, and obesity medicine, a patient representative, and a methodologic specialist.

### Disclosures

The Task Force was empaneled in accordance with AACE Conflict of Interest (COI) Policy and approved by the AACE COI Subcommittee. All members of the expert Task Force completed AACE's disclosure form regarding any multiplicities of interests

related to commercial and direct financial relationships within the preceding 12 months with companies that develop products connected with endocrine disorders. Categories for disclosure include employment, stock or other ownership, direct financial relationships (eg, speaker or consultant), research funding, authorship or panel involvement on a guidance document related to an overlapping topic, or other situations related to a perceived COI. The AACE COI Subcommittee reviewed these disclosures against an AACE-approved list of ineligible companies for this consensus statement and reached consensus regarding members who could serve on the Task Force in the nonconflicted majority, those who could serve in the conflicted minority with management strategy, and those who were disqualified from serving on the Task Force. The AACE CPG Oversight Committee reviewed and approved the AACE COI Subcommittee's decisions regarding manageable COI and empanelment. Members of this Task Force were reminded to update potential disclosures if new potential conflicts arose during their appointments and to verify currency of disclosures. AACE made every effort to minimize the potential for conflicts of interest that could influence the recommendations of this CPG. Disclosures related to obesity are provided below; however, none were deemed as conflicts of interest as there were no discussions of treatment or management options in the development of the consensus statement. B.A. serves on speakers' bureaus for Astra Zeneca, Corcept, Eli Lilly, and Novo Nordisk. J.A. serves on advisory boards for Eli Lilly and Novo Nordisk. W.G. serves as a volunteer consultant on advisory boards for Jazz Pharmaceuticals, Boehringer Ingelheim, Eli Lilly, Novo Nordisk, and Pfizer without financial compensation, serves on advisory boards for Alnylam Pharmaceuticals, Boehringer Ingelheim, Eli Lilly, Fractyl Health, and Novo Nordisk with financial compensation, and receives research support as a site principal investigator for clinical trials sponsored by his institution and funded by Eli Lilly, Novo Nordisk, Epiteomee, and Pfizer. T.K. is the owner of Ted Kyle Consulting, LLC and a consultant for Gelesis, Johnson & Johnson, Novo Nordisk, and Nutrisystem. K.N., M.A., M.B., and M.C. have nothing to disclose.

### Acknowledgments

The task force thanks the Clinical Practice Guidelines Oversight Committee for their thoughtful reviews and insightful comments on this consensus statement. The task force also thanks Carla Stec, MA, and Kendall Alexander, MPH for their assistance in document review. AACE thanks attendees of the 2022 Obesity Consensus Conference ([Appendix A](#)) for their time, participation, and insights that provided the foundation for this statement.

### Appendix A

The Consensus Statement was the result of discussions and survey results from a 1-day AACE Consensus Conference: Improving Obesity Outcomes Together.

Steering Committee: Karl Nadolsky, DO, FACE, Chair; Brandi Addison, DO, FACE; Monica Agarwal, MD, MEHP, FACE; Jaime P. Almandoz, MD, MBA, FTOS; Theodore Kyle, RPh, MBA; Nikki Massie; Jeffrey Mechanick, MD

Consensus Statement Task Force: Karl Nadolsky, DO, FACE; Brandi Addison, DO, FACE; Monica Agarwal, MD, MEHP, FACE; Jaime P. Almandoz, MD, MBA, FTOS; Melanie D. Bird, PhD, MSAM; Michelle Chaplin, PharmD, BCACP, CDCES; W. Timothy Garvey, MD, MACE; Theodore Kyle, RPh, MBA

Conference Participants

Invited Organizations: Daniel Bessesen, MD, The Obesity Society; Nina Crowley, Academy of Nutrition and Dietetics; Syeachia



Dennis, MD, MPH, American Academy of Family Physicians; Guillermo Escalante, PhD, MBA, ATC, CSCS\*D, FISSN, International Society of Sports Nutrition; Angela Fitch, MD, Obesity Medicine Association; Angela Golden, DNP, American Association of Nurse Practitioners; Jason Halford, PhD, European Association for the Study of Obesity; John Jakicic, PhD, American College of Sports Medicine; Teresa LaMasters, MD, American Society for Metabolic and Bariatric Surgery; Zhaoping Li, MD, PHD, American Society for Nutrition; Ira Monka, DO, American Osteopathic Association; Elif Oral, MD, Endocrine Society; Ximena Ramos Salas, PhD, Canadian Obesity Network; Fatima Cody Stanford, MD, American Heart Association; Guillermo Umpierrez, MD, FACE, MACP, CDCES, American Diabetes Association

Invited Individuals: Muna Almatrushi, MD; Kawkab Al balushi, MD; Alex Bonnecaze, MD; Saif Borgan, MD; David Cohen, MD, FACE; Ricardo Correa, MD, FACE, ES.D, FACP, FAPCR, FACHT, CMQ; Aaron Cypess, MD, PhD; Leslie Glasgow, MD, FACP; Marcio Griebeler, MD; Thanh Hoang, DO, FACE, FACP; Soemiwati Holland, MD, FACE; Diana Isaacs, PharmD; Sina Jasim, MD, MPH; Ania Jastreboff, MD, PhD; Joanna Miragaya, MD, PHD, FACE; Janaki Patel, MBBS; Jeffrey Schellinger, RD, MCN, CSOWN; Arya Sharma, MD; Vijay Shivaswamy, MBBS; Juliana Simonetti, MD, DABOM; Reshmi Srinath, MD; Vin Tangpricha, MD, PHD, FACE; Reshma Vijay, MD, FACE, FEDM, Volkan Yumuk, MD, FACE, FACP

Industry Organizations: Sarah Noel and Julia Dunn, MD, Eli Lilly; Anthony Fabricatore and Kimberly Williams, Novo Nordisk

AACE Executive Committee Leadership: Felice Caldarella, MD, FACE; Scott Isaacs, MD, FACE, FACP; S. Sethu Reddy, MD, MACE, FRCPC, FACE

## References

- Bray GA, Kim KK, Wilding JPH. Obesity: a chronic relapsing progressive disease process. A position statement of the World Obesity Federation. *Obes Rev*. 2017;18(7):715–723. <https://doi.org/10.1111/obr.12551>
- Jastreboff AM, Kotz CM, Kahan S, Kelly AS, Heymsfield SB. Obesity as a disease: The Obesity Society 2018 position statement. *Obesity (Silver Spring)*. 2019;27(1):7–9. <https://doi.org/10.1002/oby.22378>
- Schwartz MW, Seeley RJ, Zeltser LM, et al. Obesity pathogenesis: an Endocrine Society scientific statement. *Endocr Rev*. 2017;38(4):267–296. <https://doi.org/10.1210/er.2017-00111>
- Tomiyama AJ. Stress and obesity. *Annu Rev Psychol*. 2019;70:703–718. <https://doi.org/10.1146/annurev-psych-010418-102936>
- Fitch AK, Bays HE. Obesity definition, diagnosis, bias, standard operating procedures (SOPs), and telehealth: an Obesity Medicine Association (OMA) Clinical Practice Statement (CPS) 2022. *Obesity Pillars*. 2022;1, 100004. <https://doi.org/10.1016/j.obpill.2021.100004>
- Garvey WT, Garber AJ, Mechanick JL, et al. 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(9):977–989. <https://doi.org/10.4158/ep14280.Ps>
- Garvey WT, Mechanick JL, Brett EM, et al. 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. <https://doi.org/10.4158/ep161365.G1>
- Mechanick JL, Hurley DL, Garvey WT. Adiposity-based chronic disease as a new diagnostic term: the American Association of Clinical Endocrinologists and American College of Endocrinology position statement. *Endocr Pract*. 2017;23(3):372–378. <https://doi.org/10.4158/ep161688.Ps>
- Frühbeck G, Busetto L, Dicker D, et al. The ABCD of obesity: an EASO position statement on a diagnostic term with clinical and scientific implications. *Obes Facts*. 2019;12(2):131–136. <https://doi.org/10.1159/000497124>
- Hebebrand J, Holm JC, Woodward E, et al. A proposal of the European Association for the Study of Obesity to improve the ICD-11 diagnostic criteria for obesity based on the three dimensions etiology, degree of adiposity and health risk. *Obes Facts*. 2017;10(4):284–307. <https://doi.org/10.1159/000479208>
- Rubino F, Puhll RM, Cummings DE, et al. Joint international consensus statement for ending stigma of obesity. *Nat Med*. 2020;26(4):485–497. <https://doi.org/10.1038/s41591-020-0803-x>
- Wharton S, Lau DCW, Vallis M, et al. Obesity in adults: a clinical practice guideline. *CMAJ*. 2020;192(31):E875–E891. <https://doi.org/10.1503/cmaj.191707>
- Puhll RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver Spring)*. 2009;17(5):941–964. <https://doi.org/10.1038/oby.2008.636>
- Mechanick JL, Garber AJ, Handelsman Y, Garvey WT. American Association of Clinical Endocrinologists' position statement on obesity and obesity medicine. *Endocr Pract*. 2012;18(5):642–648. <https://doi.org/10.4158/ep12160.Ps>
- American Medical Association House of Delegates. Recognition of obesity as a disease. <http://www.ama-assn.org/ama/pub/news/news/2013/2013-06-18-new-ama-policies-annual-meeting.page>. Accessed October 3, 2022.
- Puhll RM, Andreyeva T, Brownell KD. Perceptions of weight discrimination: prevalence and comparison to race and gender discrimination in America. *Int J Obes (Lond)*. 2008;32(6):992–1000. <https://doi.org/10.1038/ijo.2008.22>
- Puhll RM, Himmelstein MS, Quinn DM. Internalizing weight stigma: prevalence and sociodemographic considerations in U.S. adults. *Obesity (Silver Spring)*. 2018;26(1):167–175. <https://doi.org/10.1002/oby.22029>
- Puhll RM, Himmelstein MS, Watson RJ. Weight-based victimization among sexual and gender minority adolescents: findings from a diverse national sample. *Pediatr Obes*. 2019;14(7), e12514. <https://doi.org/10.1111/ijpo.12514>
- Puhll RM, Himmelstein MS, Pearl RL. Weight stigma as a psychosocial contributor to obesity. *Am Psychol*. 2020;75(2):274–289. <https://doi.org/10.1037/amp0000538>
- Sutin AR, Stephan Y, Terracciano A. Weight discrimination and risk of mortality. *Psychol Sci*. 2015;26(11):1803–1811. <https://doi.org/10.1177/0956797615601103>
- Rossi AA, Manzoni GM, Pietrabissa G, Di Pauli D, Mannarini S, Castelnovo G. Weight stigma in patients with overweight and obesity: validation of the Italian Weight Self-Stigma Questionnaire (WSSQ). *Eat Weight Disord*. 2022;27(7):2459–2472. <https://doi.org/10.1007/s40519-022-01385-8>
- Sabin JA, Marini M, Nosek BA. Implicit and explicit anti-fat bias among a large sample of medical doctors by BMI, race/ethnicity and gender. *PLoS One*. 2012;7(11), e48448. <https://doi.org/10.1371/journal.pone.0048448>
- Brownstein M, Madva A, Gawronski B. What do implicit measures measure? *Wiley Interdiscip Rev Cogn Sci*. 2019;10(5), e1501. <https://doi.org/10.1002/wcs.1501>
- Dovidio JF, Kawakami K, Johnson C, Johnson B, Howard A. On the nature of prejudice: automatic and controlled processes. *J Exp Soc Psychol*. 1997;33(5):510–540. <https://doi.org/10.1006/jesp.1997.1331>
- Phelan SM, Puhll RM, Burke SE, et al. The mixed impact of medical school on medical students' implicit and explicit weight bias. *Med Educ*. 2015;49(10):983–992. <https://doi.org/10.1111/medu.12770>
- Sabin JA. Tackling implicit bias in health care. *N Engl J Med*. 2022;387(2):105–107. <https://doi.org/10.1056/nejmp2201180>
- Pearl RL, Puhll RM. Weight bias internalization and health: a systematic review. *Obes Rev*. 2018;19(8):1141–1163. <https://doi.org/10.1111/obr.12701>
- Verhaak AMS, Ferrand J, Puhll RM, Tishler DS, Pappasavvas PK, Umashanker D. Experienced weight stigma, internalized weight bias, and clinical attrition in a medical weight loss patient sample. *Int J Obes (Lond)*. 2022;46(6):1241–1243. <https://doi.org/10.1038/s41366-022-01087-2>
- Bennett BL, Lawson JL, Funaro MC, Ivezaj V. Examining weight bias before and/or after bariatric surgery: a systematic review. *Obes Rev*. 2022;23(11), e13500. <https://doi.org/10.1111/obr.13500>
- Durso LE, Latner JD. Understanding self-directed stigma: development of the weight bias internalization scale. *Obesity (Silver Spring)*. 2008;16(suppl 2):S80–S86. <https://doi.org/10.1038/oby.2008.448>
- Lillis J, Luoma JB, Levin ME, Hayes SC. Measuring weight self-stigma: the weight self-stigma questionnaire. *Obesity (Silver Spring)*. 2010;18(5):971–976. <https://doi.org/10.1038/oby.2009.353>
- Engel GL. The need for a new medical model: a challenge for biomedicine. *Science*. 1977;196(4286):129–136. <https://doi.org/10.1126/science.847460>
- Habtewold TD, Islam MA, Radie YT, Tegegne BS. Comorbidity of depression and diabetes: an application of biopsychosocial model. *Int J Ment Health Syst*. 2016;10:74. <https://doi.org/10.1186/s13033-016-0106-2>
- Garvey WT. New tools for weight-loss therapy enable a more robust medical model for obesity treatment: rationale for a complications-centric approach. *Endocr Pract*. 2013;19(5):864–874. <https://doi.org/10.4158/ep13263.Ra>
- Obesity: preventing and managing the global epidemic. Report of a WHO consultation. *World Health Organ Tech Rep Ser*. 2000;894(i-xii):1–253.
- WHO Expert Consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *Lancet*. 2004;363(9403):157–163. [https://doi.org/10.1016/s0140-6736\(03\)15268-3](https://doi.org/10.1016/s0140-6736(03)15268-3)
- Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults—the evidence report. *National Institutes of Health. Obes Res*. 1998;6(suppl 2):51S–209S.
- 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. <https://doi.org/10.1136/bmj.i2156>
- 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(5):791–799. <https://doi.org/10.1038/ijo.2010.5>
- Winter JE, MacLinnis RJ, Wattanapenpaiboon N, Nowson CA. BMI and all-cause mortality in older adults: a meta-analysis. *Am J Clin Nutr*. 2014;99(4):875–890. <https://doi.org/10.3945/ajcn.113.068122>

41. Di Angelantonio E, Bhupathiraju SN, Wormser D, et al. Body-mass index and all-cause mortality: individual-participant-data meta-analysis of 239 prospective studies in four continents. *Lancet*. 2016;388(10046):776–786. [https://doi.org/10.1016/s0140-6736\(16\)30175-1](https://doi.org/10.1016/s0140-6736(16)30175-1)
42. Bovet P, Chiolero A, Gedeon J. Health effects of overweight and obesity in 195 countries. *N Engl J Med*. 2017;377(15):1495–1497. <https://doi.org/10.1056/nejmc1710026>
43. Jayedi A, Khan TA, Aune D, Emadi A, Shab-Bidar S. Body fat and risk of all-cause mortality: a systematic review and dose-response meta-analysis of prospective cohort studies. *Int J Obes (Lond)*. 2022;46(9):1573–1581. <https://doi.org/10.1038/s41366-022-01165-5>
44. Robson E, Norris T, Costa S, Kivimäki M, Hamer M, Johnson W. Contribution of 20-year body mass index and waist circumference history to poor cardiometabolic health in overweight/obese and normal weight adults: a cohort study. *Nutr Metab Cardiovasc Dis*. 2021;31(10):2851–2859. <https://doi.org/10.1016/j.numecd.2021.06.005>
45. Rao G, Powell-Wiley TM, Ancheta I, et al. Identification of obesity and cardiovascular risk in ethnically and racially diverse populations: a scientific statement from the American Heart Association. *Circulation*. 2015;132(5):457–472. <https://doi.org/10.1161/cir.0000000000000223>
46. Neeland IJ, Ross R, Després J-P, et al. Visceral and ectopic fat, atherosclerosis, and cardiometabolic disease: a position statement. *Lancet Diabetes Endocrinol*. 2019;7(9):715–725. [https://doi.org/10.1016/s2213-8587\(19\)30084-1](https://doi.org/10.1016/s2213-8587(19)30084-1)
47. Jensen MD, Ryan DH, Apovian CM, et al. 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(25 suppl 2):S102–S138. <https://doi.org/10.1161/01.cir.0000437739.71477.ee>
48. Powell-Wiley TM, Poirier P, Burke LE, et al. Obesity and cardiovascular disease: a scientific statement from the American Heart Association. *Circulation*. 2021;143(21):e984–e1010. <https://doi.org/10.1161/cir.0000000000000973>
49. Ross R, Neeland IJ, Yamashita S, et al. Waist circumference as a vital sign in clinical practice: a Consensus Statement from the IAS and ICCR Working Group on Visceral Obesity. *Nat Rev Endocrinol*. 2020;16(3):177–189. <https://doi.org/10.1038/s41574-019-0310-7>
50. U.S. Preventive Services Task Force. Behavioral weight loss interventions to prevent obesity-related morbidity and mortality in adults: U.S. Preventive Services Task Force recommendation statement. *JAMA*. 2018;320(11):1163–1171. <https://doi.org/10.1001/jama.2018.13022>
51. Cardel MI, Newsome FA, Pearl RL, et al. Patient-centered care for obesity: how health care providers can treat obesity while actively addressing weight stigma and eating disorder risk. *J Acad Nutr Diet*. 2022;122(6):1089–1098. <https://doi.org/10.1016/j.jand.2022.01.004>
52. Tomiyama AJ, Carr D, Granberg EM, et al. How and why weight stigma drives the obesity ‘epidemic’ and harms health. *BMC Med*. 2018;16(1):123. <https://doi.org/10.1186/s12916-018-1116-5>
53. Kiesel L, Eichbaum C, Baumeier A, Eichbaum M. Obesity epidemic—the underestimated risk of endometrial cancer. *Cancers*. 2020;12(12):3860. <https://doi.org/10.3390/cancers12123860>
54. Lauby-Secretan B, Scoccianti C, Loomis D, Grosse Y, Bianchini F, Straif K. Body fatness and cancer—viewpoint of the IARC Working Group. *N Engl J Med*. 2016;375(8):794–798. <https://doi.org/10.1056/NEJMs1606602>
55. Yeh HC, Bantle JP, Cassidy-Begay M, et al. Intensive weight loss intervention and cancer risk in adults with type 2 diabetes: analysis of the Look AHEAD Randomized Clinical Trial. *Obesity (Silver Spring)*. 2020;28(9):1678–1686. <https://doi.org/10.1002/oby.22936>
56. Taftian M, Beigrezaei S, Arabi V, Salehi-Abargouei A. The effect of ketogenic diet on weight loss in adult patients with cancer: a systematic review and meta-analysis of controlled clinical trials. *Nutr Cancer*. 2022;74(4):1222–1234. <https://doi.org/10.1080/01635581.2021.1942081>
57. Zhang X, Rhoades J, Caan BJ, et al. Intentional weight loss, weight cycling, and endometrial cancer risk: a systematic review and meta-analysis. *Int J Gynecol Cancer*. 2019;29(9):1361–1371. <https://doi.org/10.1136/ijgc-2019-000728>
58. 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(1):61–69. <https://doi.org/10.1002/oby.22054>
59. Pearl RL, Wadden TA, Bach C, Tronieri JS, Berkowitz RI. Six-month follow-up from a randomized controlled trial of the Weight BIAS Program. *Obesity (Silver Spring)*. 2020;28(10):1878–1888. <https://doi.org/10.1002/oby.22931>
60. Mancini A, Borel AL, Coumes S, Wion N, Arvieux C, Reche F. Bariatric surgery improves the employment rate in people with obesity: 2-year analysis. *Surg Obes Relat Dis*. 2018;14(11):1700–1704. <https://doi.org/10.1016/j.soard.2018.06.026>
61. Garvey WT, Mechanick JL. Proposal for a scientifically correct and medically actionable disease classification system (ICD) for obesity. *Obesity (Silver Spring)*. 2020;28(3):484–492. <https://doi.org/10.1002/oby.22727>
62. 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(1):27–31.
63. 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. <https://doi.org/10.1186/1472-6963-10-159>
64. Himmelstein MS, Puhl RM. At multiple fronts: diabetes stigma and weight stigma in adults with type 2 diabetes. *Diabet Med*. 2021;38(1), e14387. <https://doi.org/10.1111/dme.14387>
65. Tahrani AA, Morton J. Benefits of weight loss of 10% or more in patients with overweight or obesity: a review. *Obesity (Silver Spring)*. 2022;30(4):802–840. <https://doi.org/10.1002/oby.23371>
66. Garvey WT. Is obesity or adiposity-based chronic disease curable: the set point theory, the environment, and second-generation medications. *Endocr Pract*. 2022;28(2):214–222. <https://doi.org/10.1016/j.eprac.2021.11.082>
67. Lingvay I, Sumithran P, Cohen RV, le Roux CW. Obesity management as a primary treatment goal for type 2 diabetes: time to reframe the conversation. *Lancet*. 2022;399(10322):394–405. [https://doi.org/10.1016/s0140-6736\(21\)01919-x](https://doi.org/10.1016/s0140-6736(21)01919-x)
68. Chung WK, Erion K, Florez JC, et al. Precision medicine in diabetes: a consensus report from the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). *Diabetes Care*. 2020;43(7):1617–1635. <https://doi.org/10.2337/dci20-0022>
69. Blonde L, Umpierrez GE, Reddy SS, et al. American Association of Clinical Endocrinology clinical practice guideline: developing a diabetes mellitus comprehensive care plan—2022 update. *Endocr Pract*. 2022;28(10):923–1049. <https://doi.org/10.1016/j.eprac.2022.08.002>
70. Hall ME, Cohen JB, Ard JD, et al. Weight-loss strategies for prevention and treatment of hypertension: a scientific statement from the American Heart Association. *Hypertension*. 2021;78(5):e38–e50. <https://doi.org/10.1161/hyp.0000000000000202>
71. Handelsman Y, Jellinger PS, Guerin CK, et al. Consensus statement by the American Association of Clinical Endocrinologists and American College of Endocrinology on the management of dyslipidemia and prevention of cardiovascular disease algorithm - 2020 executive summary. *Endocr Pract*. 2020;26(10):1196–1224. <https://doi.org/10.4158/cs-2020-0490>
72. Cusi K, Isaacs S, Barb D, et al. American Association of Clinical Endocrinology clinical practice guideline for the diagnosis and management of nonalcoholic fatty liver disease in primary care and endocrinology clinical settings: co-sponsored by the American Association for the Study of Liver Diseases (AASLD). *Endocr Pract*. 2022;28(5):528–562. <https://doi.org/10.1016/j.eprac.2022.03.010>
73. Gregg EW, Jakicic JM, Blackburn G, et al. Association of the magnitude of weight loss and changes in physical fitness with long-term cardiovascular disease outcomes in overweight or obese people with type 2 diabetes: a post-hoc analysis of the Look AHEAD randomised clinical trial. *Lancet Diabetes Endocrinol*. 2016;4(11):913–921. [https://doi.org/10.1016/s2213-8587\(16\)30162-0](https://doi.org/10.1016/s2213-8587(16)30162-0)
74. Aminian A, Wilson R, Zajichek A, et al. Cardiovascular outcomes in patients with type 2 diabetes and obesity: comparison of gastric bypass, sleeve gastrectomy, and usual care. *Diabetes Care*. 2021;44(11):2552–2563. <https://doi.org/10.2337/dc20-3023>
75. Piché ME, Tchernof A, Després JP. Obesity phenotypes, diabetes, and cardiovascular diseases. *Circ Res*. 2020;126(11):1477–1500. <https://doi.org/10.1161/circresaha.120.316101>
76. Brower MA, Hai Y, Jones MR, et al. Bidirectional Mendelian randomization to explore the causal relationships between body mass index and polycystic ovary syndrome. *Hum Reprod*. 2019;34(1):127–136. <https://doi.org/10.1093/humrep/dey343>
77. Wang FF, Wu Y, Zhu YH, et al. Pharmacologic therapy to induce weight loss in women who have obesity/overweight with polycystic ovary syndrome: a systematic review and network meta-analysis. *Obes Rev*. 2018;19(10):1424–1445. <https://doi.org/10.1111/obr.12720>
78. Lie Fong S, Douma A, Verhaeghe J. Implementing the international evidence-based guideline of assessment and management of polycystic ovary syndrome (PCOS): how to achieve weight loss in overweight and obese women with PCOS? *J Gynecol Obstet Hum Reprod*. 2021;50(6), 101894. <https://doi.org/10.1016/j.jogoh.2020.101894>
79. Hoeger KM, Dokras A, Piltonen T. Update on PCOS: consequences, challenges, and guiding treatment. *J Clin Endocrinol Metab*. 2021;106(3):e1071–e1083. <https://doi.org/10.1210/clinem/dgaa839>
80. Dhindsa S, Ghanim H, Batra M, Dandona P. Hypogonadotropic hypogonadism in men with diabetes. *Diabetes Care*. 2018;41(7):1516–1525. <https://doi.org/10.2337/dc17-2510>
81. Fernandez CJ, Chacko EC, Pappachan JM. Male obesity-related secondary hypogonadism - pathophysiology, clinical implications and management. *Eur Endocrinol*. 2019;15(2):83–90. <https://doi.org/10.17925/ee.2019.15.2.83>
82. Foster GD, Borradaile KE, Sanders MH, et al. A randomized study on the effect of weight loss on obstructive sleep apnea among obese patients with type 2 diabetes: the Sleep AHEAD study. *Arch Intern Med*. 2009;169(17):1619–1626. <https://doi.org/10.1001/archinternmed.2009.266>
83. Singh M, Lee J, Gupta N, et al. Weight loss can lead to resolution of gastroesophageal reflux disease symptoms: a prospective intervention trial. *Obesity (Silver Spring)*. 2013;21(2):284–290. <https://doi.org/10.1002/oby.20279>

84. Wing RR, Creasman JM, West DS, et al. Improving urinary incontinence in overweight and obese women through modest weight loss. *Obstet Gynecol.* 2010;116(2 pt 1):284–292. <https://doi.org/10.1097/AOG.0b013e3181e8fb60>
85. King WC, Chen JY, Belle SH, et al. Change in pain and physical function following bariatric surgery for severe obesity. *JAMA.* 2016;315(13):1362–1371. <https://doi.org/10.1001/jama.2016.3010>
86. Dowsey MM, Brown WA, Cochrane A, Burton PR, Liew D, Choong PF. Effect of bariatric surgery on risk of complications after total knee arthroplasty: a randomized clinical trial. *JAMA Netw Open.* 2022;5(4), e226722. <https://doi.org/10.1001/jamanetworkopen.2022.6722>
87. Khalil H, Ellwood L, Lord H, Fernandez R. Pharmacological treatment for obesity in adults: an umbrella review. *Ann Pharmacother.* 2020;54(7):691–705. <https://doi.org/10.1177/1060028019898912>
88. Garvey WT. New horizons. A new paradigm for treating to target with second-generation obesity medications. *J Clin Endocrinol Metab.* 2022;107(4):e1339–e1347. <https://doi.org/10.1210/clinem/dgab848>
89. Angelidi AM, Belanger MJ, Kokkinos A, Koliaki CC, Mantzoros CS. Novel noninvasive approaches to the treatment of obesity: from pharmacotherapy to gene therapy. *Endocr Rev.* 2022;43(3):507–557. <https://doi.org/10.1210/edrv/bnab034>
90. Eisenberg D, Shikora SA, Aarts E, et al. 2022 American Society for Metabolic and Bariatric Surgery (ASMBS) and International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO): indications for metabolic and bariatric surgery. *Surg Obes Relat Dis.* 2022;18(12):1345–1356. <https://doi.org/10.1016/j.soard.2022.08.013>