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

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This document represents the official position of the American Association of Clinical Endocrinologists and the American College of Endocrinology. Where there were no randomized controlled trials or specific U.S. FDA labeling for issues in clinical practice, the participating clinical experts utilized their judgment and experience. Every effort was made to achieve consensus among the committee members. Position statements are meant to provide guidance, but they are not to be considered prescriptive for any individual patient and cannot replace the judgment of a clinician.

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2014 CONSENSUS CONFERENCE ON OBESITY PILLAR PARTICIPANTS

These individuals and/or organizations were invitees to the 2014 AACE/ACE Consensus Conference on Obesity, have reviewed the *Advanced Framework for a new Diagnosis of Obesity as a Chronic Disease*, and agree to participate in the further development of the diagnosis with the goal that it will help facilitate concerted action across multiple stakeholders in a comprehensive plan to combat obesity.

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Abbreviations:
AACE = American Association of Clinical Endocrinologists; **AC** = affirmed concept; **ACE** = American College of Endocrinology; **BMI** = body mass index; **CCO** = Consensus Conference on Obesity; **EC** = emergent concept

SYNOPSIS

- Obesity is a chronic disease
- Emergent Concept 1 (EC.1) from the American Association of Clinical Endocrinologists and the American College of Endocrinology (AACE/ACE) Consensus Conference on Obesity (CCO) calls for a new medically meaningful and actionable diagnosis of obesity
- An advanced framework for further discussion and translation of EC.1 is provided
  - The definition of obesity requires anthropometric and clinical descriptors
  - The diagnosis and management of obesity requires a process of screening, evaluation of complications (using checklist), staging, and algorithmic management
- This advanced framework has been approved by AACE and will be distributed to the wide array of stakeholders who attended the CCO for structured discussion and creation of a consensus diagnosis that is broadly actionable

THE PURPOSE AND MANDATE FOR A NEW DIAGNOSTIC APPROACH TO OBESITY

The 2014 American Association of Clinical Endocrinologists and the American College of Endocrinology (AACE/ACE) Consensus Conference on Obesity (CCO) was convened to establish an evidence base that could be used to develop a comprehensive plan to combat obesity. The Conference involved a wide array of national stakeholders (the "Pillars") with a vested interest in obesity, whose concerted participation would be necessary to support an effective overall action plan. A key consensus concept that emerged from the Conference was that a more medically meaningful and actionable definition of obesity was needed. It became clear that the diagnosis based solely on anthropometric measures (e.g., body mass index [BMI]) lacked information needed for concerted action among healthcare professionals, healthcare systems, regulators, payers, and employers. Furthermore, the elements for an improved diagnosis should include both the anthropometric criterion together with an indication of the degree to which the weight gain was negatively impacting the health of individual patients.

This document addresses this problem of diagnostic uncertainty and is the first step in removing this impediment for concerted and comprehensive action. This advanced framework (Table 1) for a new diagnosis of obesity as a chronic disease translates the emergent concept from the AACE CCO into an actionable recommendation. Because concerted action will be necessary, this framework will be submitted to our Pillar partners for comment and recommendations. With our partners, we will explore new terminology to improve communication and implementation, develop a new diagnostic algorithm that is mapped to evidence-based risk-stratified patient subsets, and apply the AACE/ACE complications-centric obesity management algorithm. This document has been approved by the AACE/ACE Board of Directors and will be distributed to the 2014 CCO Pillar representatives with a structured questionnaire for comments. The goal will be to achieve consensus for a medically meaningful and actionable diagnosis of obesity that will support access to rationally delivered interventions for obesity prevention and treatment.

THE DIAGNOSIS OF OBESITY

A new definition and diagnostic strategy for obesity is required that is actionable, medically meaningful, and adds value to the health-promoting effects of weight loss. The AACE/ACE defines obesity as a chronic disease characterized by pathophysiological processes that result in increased adipose tissue mass and which can result in increased morbidity and mortality. In an environment that interacts with susceptibility genes to promote weight gain

Table 1		
The AACE Advanced Framework for a New Diagnosis of Obesity		
Diagnosis	**Anthropometric component**	**Clinical component**
Overweight	BMI 25-29.9 kg/m^2	No obesity-related complications
Obesity	BMI ≥30 kg/m^2	No obesity-related complications
Obesity stage 1	BMI ≥25 kg/m^2	Presence of 1 or more mild-to-moderate obesity-related complications
Obesity stage 2	BMI ≥25 kg/m^2	Presence of 1 or more severe obesity-related complications
Abbreviation: BMI = body mass index		

(i.e., obesogenic), many individuals have a BMI ≥25 kg/m^2, which is associated with increased likelihood for obesity-related complications and risk of progressive obesity. The new obesity diagnostic algorithm (Fig. 1) incorporates two components: *1*) an assessment of body mass, including validated ethnicity-adjusted anthropometrics to identify individuals with increased adipose tissue placing them at risk and *2*) the presence and severity of obesity-related complications. Thus, the complete diagnosis does not simply depend upon BMI level but also the impact of that weight gain on health. Individuals with BMI ≥25 kg/m^2 (or in certain populations a BMI of 23-25 kg/m^2) then require evaluation for the presence and severity of specific obesity-related complications to complete the diagnostic process. Each complication is evaluated for severity and impact on the patient's health as Stage 0 (no complication is present), Stage 1 (complication is mild-moderate), or Stage 2 (complication is severe) using complication-specific criteria. The staging of complications can be used to guide selection of treatment modality and intensity of weight-loss therapy in the context of the AACE obesity management algorithm that is part of the AACE/ACE Comprehensive Diabetes Management Algorithm (1).

The diagnosis facilitates another mandate of the CCO that a comprehensive action plan to combat obesity must include primary, secondary, and tertiary disease interventions. If the BMI is <25 kg/m^2 (and waist circumference is not increased), these patients have normal weights and are candidates for primary interventions to prevent obesity, perhaps through healthy lifestyle education and reductions in the obesogenic nature of their environment. If the patients are overweight or obese and have no complications (Stage 0), they are eligible for secondary interventions to prevent progressive weight gain and the emergence of obesity-related complications. Once complications develop, whether individuals are overweight or obese, it has become clear that the increase in body weight is adversely affecting the health of the individual, and tertiary interventions are required to prevent worsening of the disease and to treat the complications. Thus, all patients with BMI ≥25 kg/m^2 and obesity-related complications require tertiary interventions, and have Obesity Stage 1 if mild-moderate (but no severe) complications are present and Obesity Stage 2 if severe complications are present. The identification and staging of obesity-related complications is based on complication-specific criteria. Table 2 illustrates the Advanced Framework to incorporate the principles of primary, secondary, and tertiary interventions and treatment.

The new diagnosis aligns itself with a 4-step approach for the evaluation of patients with obesity, and entrains professionals by providing them with a structured paradigm for patient management consistent with high-quality care. The 4 recommended steps are: *1*) screening with BMI with adjustments for ethnic differences, *2*) clinical evaluation for the presence of obesity-related complications using

a checklist, *3*) staging for the severity of complications using complication-specific criteria, and *4*) selection of prevention and/or intervention strategies targeting specific complications as guided by the AACE/ACE obesity management algorithm. These recommendations have been translated from concepts and evidence derived from the AACE/ACE CCO on March 23-24, 2014 in Washington, DC (2).

RATIONALE, PRINCIPLES, AND DEVELOPMENT OF THE DIAGNOSTIC APPROACH

The 2014 AACE/ACE CCO

The 2014 AACE/ACE CCO was predicated on a belief that concerted action among a diverse array of stakeholders is required for significant reduction in obesity prevalence rates. The Conference convened March 23 and 24, 2014 in Washington, DC, and resulted in a portfolio of "affirmed concepts" (ACs) representing the validation of previously held concepts and practices, and "emergent concepts" (ECs) that became apparent only through the vigorous analyses and discussions emanating from the multidisciplinary cohort of attendees that included insights from health care professionals, government/regulatory entities, pharmaceutical industry, large employers, large payers, lay and professional organizations, educational organizations, and research sponsors (2). The principal finding, reflected in EC.1, was that the diagnostic definition of obesity needs to be improved. The justification for this is that conference participants, representing a broad base of stakeholders in the American healthcare system with a vested interest in the problem of obesity, identified the current definition as a major obstacle to concerted action. Despite the paradigm shift suggested by increased numbers of organizations recognizing obesity as a chronic disease, the diagnosis of obesity has not changed. The old diagnosis primarily relied on the anthropomorphic measure of BMI (3,4), with uncertainties regarding how an increase in BMI affects individual health. AACE/ACE has developed a new definition and diagnostic algorithm, which is actionable and medically meaningful, and represents a translation of the findings of the CCO. The lack of a medically meaningful strategy and poor translation of accumulating scientific data regarding the pathogenesis of obesity as a chronic disease have also limited the effectiveness of public health initiatives.

Rationale and Underlying Principles

This new strategy is based upon current scientific evidence indicating that the pathogenesis of obesity conforms to the chronic disease model; that is, a disease that arises from the interaction of susceptibility genes, environment, and behavior with overlapping or additional subsets of gene-environment interactions determining disease severity, health impacts, and complication development. The
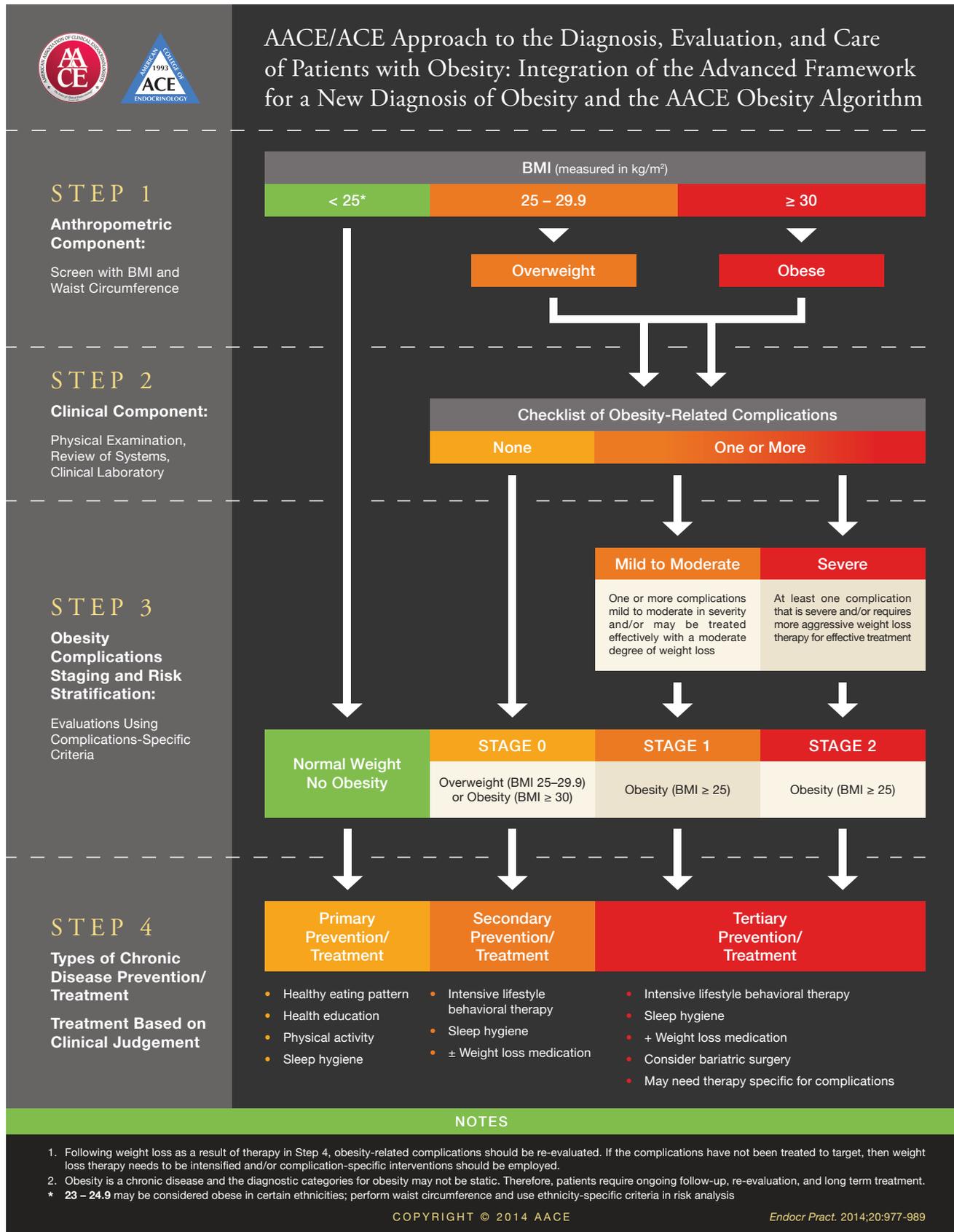
AACE/ACE Approach to the Diagnosis, Evaluation, and Care of Patients with Obesity: Integration of the Advanced Framework for a New Diagnosis of Obesity and the AACE Obesity Algorithm

STEP 1

Anthropometric Component:

Screen with BMI and Waist Circumference

BMI (measured in kg/m²)		
< 25*	25 – 29.9	≥ 30

Overweight → Obese

STEP 2

Clinical Component:

Physical Examination, Review of Systems, Clinical Laboratory

Checklist of Obesity-Related Complications	
None	One or More

STEP 3

Obesity Complications Staging and Risk Stratification:

Evaluations Using Complications-Specific Criteria

Mild to Moderate	Severe
One or more complications mild to moderate in severity and/or may be treated effectively with a moderate degree of weight loss	At least one complication that is severe and/or requires more aggressive weight loss therapy for effective treatment

Normal Weight No Obesity	STAGE 0	STAGE 1	STAGE 2
	Overweight (BMI 25–29.9) or Obesity (BMI ≥ 30)	Obesity (BMI ≥ 25)	Obesity (BMI ≥ 25)

STEP 4

Types of Chronic Disease Prevention/Treatment

Treatment Based on Clinical Judgement

Primary Prevention/Treatment	Secondary Prevention/Treatment	Tertiary Prevention/Treatment
• Healthy eating pattern • Health education • Physical activity • Sleep hygiene	• Intensive lifestyle behavioral therapy • Sleep hygiene • ± Weight loss medication	• Intensive lifestyle behavioral therapy • Sleep hygiene • + Weight loss medication • Consider bariatric surgery • May need therapy specific for complications

NOTES

1. Following weight loss as a result of therapy in Step 4, obesity-related complications should be re-evaluated. If the complications have not been treated to target, then weight loss therapy needs to be intensified and/or complication-specific interventions should be employed.
2. Obesity is a chronic disease and the diagnostic categories for obesity may not be static. Therefore, patients require ongoing follow-up, re-evaluation, and long term treatment.
* **23 – 24.9** may be considered obese in certain ethnicities; perform waist circumference and use ethnicity-specific criteria in risk analysis

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Fig. 1

Table 2
The AACE Advanced Framework and Levels of Treatment and Prevention for Chronic Diseases

Diagnosis	Anthropometric component	Clinical component	Prevention/ treatment
Normal weight	BMI <25 kg/m^2		Primary
Overweight	BMI 25-29.9 kg/m^2	No obesity-related complications	Secondary
Obesity	BMI ≥30 kg/m^2	No obesity-related complications	
Obesity stage 1	BMI ≥25 kg/m^2	Presence of 1 or more mild-to-moderate obesity-related complications	Tertiary
Obesity stage 2	BMI ≥25 kg/m^2	Presence of 1 or more severe obesity-related complications	
Abbreviation: BMI = body mass index			

new strategy addresses these issues and specifically incorporates the following attributes of an obesity chronic disease model:

- Obesity as a chronic disease (5);
- Obesity results from the complex interaction of multiple biological factors (e.g., susceptibility genes), environmental factors (e.g., built environment), and behavior;
- High prevalence rates and an obesogenic environment place a majority of individuals in many societies at some level of risk; therefore, all individuals must be screened;
- Screening should include BMI but not exclude other measures that more directly quantify adipose tissue mass, in a preventive care model, including adjustments for ethnic differences in risk thresholds and modifiers to account for epidemiological, behavioral, and physiological differences among individuals;
- The diagnosis of obesity prioritizes organ dysfunction resulting in discernible complications as a marker of disease and disease severity;
- A complication-centric approach to management will target increasingly aggressive therapeutic approaches to those patients with obesity-related complications who will most benefit from treatment, thus optimizing patient outcomes, benefit/risk ratio of intervention, and cost effectiveness (1,6);
- There is an emphasis on obesity-related complications that can be ameliorated by weight-loss therapy;
- The diagnosis appropriately designates individuals appropriate for primary, secondary, and tertiary interventions for prevention and treatment;
- Screening, diagnosis, and staging are relevant to management options, as directed by the AACE/ACE Obesity Algorithm (1), which treats complications as the end point of weight loss therapy, not BMI

**Development of the Diagnostic Approach:
Questions to be Vetted by Pillar Partners**

The new obesity diagnosis will require input from multiple stakeholders to assure broad-based acceptance and concerted action in a comprehensive plan to combat obesity. Therefore, our pillar participants will be asked for feedback. Some questions requiring vetting are included below.

a. **Improvements in the Advanced Framework.** Are there improvements needed in the diagnosis to better indicate what we are treating and why are we treating it?

b. **Alternative medical term other than "obesity."** The term obesity has been widely used in multiple contexts and conveys a sense of stigmatization for patients. Do we need new terminology when approaching the prevention and treatment of this disease and its complications from a clinical perspective? Should consideration be given to renaming the chronic disease state in a format that effectively reflects the concept of weight-driven disease, for example **"adiposity-based chronic disease (ABCD)"**; this concept is consistent with the use of alternative diagnostic labels for diseases identified by eponyms, popular references, or antiquated terminology ("obesity" derived from *obesitas*, *obdere*, or *ob + edere* all meaning "fatness" or "to overeat" and not reflecting a pathophysiology).

c. **Role of waist circumference measurement.** What is the optimal use of waist circumference? Should it be used as an essential criterion for the anthropometric component in all patients or in subgroups of patients, and what is its role in evaluating patients for risks of cardiometabolic conditions (e.g., prediabetic states, cardiovascular disease risk, etc.)?

d. **Incorporation of overweight and obesity designations.** What is the rationale for discriminating between

patients with overweight (BMI 25-29.9) and obesity (BMI ≥30) in a medically meaningful diagnostic algorithm? Should patients who are overweight by BMI (i.e., BMI 25-29.9) never be referred to as patients with obesity even if they have complications (e.g., Obesity Stage 1 or 2)? Isn't an overweight patient with a given complication just as deserving of weight loss therapy as an obese patient with the same complication, and, therefore, the distinction between overweight and obesity should not be retained? On the other hand, is this differentiation warranted because the prevalence of many obesity-related complications will increase as the BMI increases? Other thoughts?

e. **Concept of "pre-obesity."** Is there any advantage to adopting a diagnosis of pre-obesity for overweight or obese patients without complications?

f. **Cost effectiveness.** The diagnostic approach should facilitate an economically viable model for obesity care by targeting more aggressive weight-loss interventions to those patients with complications who will derive the greatest benefit (i.e., highest benefit/risk of the intervention and cost effectiveness). The process must not dilute resources needed for high-risk individuals requiring care and not expand aggressive interventions to lower-morbidity patient populations beyond the capacity of our healthcare system, while at the same time taking into account the "value" of obesity care in enhancing quality of life and disease prevention.

g. **Elderly patients.** How should the diagnostic and treatment paradigm for obesity be modified for elderly patients (e.g., >70 years of age)?

SCREENING, DIAGNOSIS, COMPLICATIONS STAGING, AND MANAGEMENT OF OBESITY AS A DISEASE

Step 1. Screening and the Anthropometric Component of Diagnosis

1.1 All Americans must be screened using BMI.

1.2 BMI ≥25 kg/m^2 is one component of the diagnosis of obesity. Individuals with BMI ≥25 kg/m^2 meet the criterion for Overweight (BMI 25-29.9) or Obesity (BMI ≥30), and then must be assessed for the clinical component (see Step 2) to complete the diagnostic process. Patients with BMI ≥25 can have obesity-related complications treatable by weight-loss therapy whether they are overweight or obese.

1.3 In certain ethnic groups (e.g., South Asians), individuals with BMI 23 to 25 kg/m^2 can still be diagnosed as obese, and should be further evaluated with measreument of waist circumference using population and

Ethnic-specific Values for Waist Circumference: International Diabetes Federation Consensus Worldwide Definition of Metabolic Syndrome (www.idf.org)		
Population	**Male**	**Female**
United States	≥102 cm or 40 in	≥88 cm or 35 in
Europids (Caucasians)	≥94 cm or 37 in	≥80 cm or 31 in
South Asians, Chinese, Japanese	≥90cm or 35 in	≥80 cm or 31 in
South and Central Americans	Use South Asian criteria until more specific data are available	
Sub-Saharan Africans, Eastern Mediterranean and Middle East (Arab)	Use Europid criteria until more specific data are available	

ethnicity specific threshold values as delineated by the International Diabetes Federation (3,4,7).

1.4 If an individual is edematous, elderly with sarcopenic obesity, or highly muscular, then clinical judgment and/or dual-energy X-ray absorptiometry (DXA) should be employed to identify individuals with high risk for obesity based on fat mass with attention to gender differences in body composition.

1.5 Individuals who meet the anthropometric criterion for the diagnosis of overweight or obesity would then be evaluated for obesity-related complications (i.e., the clinical criterion that constitutes the second component of the diagnostic algorithm). In this way, the anthropometric criterion is necessary but not sufficient for a complete diagnosis, which also requires the pathophysiological component as reflected in complications or risk of complications as a marker of disease severity.

Step 2. The Clinical Component of Diagnosis and Obesity-Related Complications

2.1 Individuals who meet the anthropometric criterion for overweight or obesity must then undergo evaluation for the presence or absence of obesity-related complications, the clinical criterion, to complete the diagnosis of obesity.

2.2 Initial evaluation is standard for "new" patient visits, and would include history, physical examination, review of systems, and clinical laboratory. Relevant baseline clinical information would include blood pressure, waist circumference, fasting glucose, fasting lipid panel (total cholesterol, low-density lipoprotein cholesterol [LDL-c], high-density lipoprotein cholesterol [HDL-c], triglycerides), creatinine, and hepatic

transaminases, in addition to assessment of diet, meal pattern preferences, and physical activity. An obesity-focused review of systems could be obtained using a form that the patient could fill out in the office or prior to the initial visit.

2.2 Diagnostic evaluation includes a stepped evaluation protocol and checklist for the presence of obesity-related complications based on information from the initial visit, with an emphasis on those complications that can be ameliorated using weight loss therapy, as illustrated in Table 3. The initial basic clinical evaluation is sufficient to determine whether many obesity-related complications are present or absent, or to strongly suspect their presence. In many instances, further evaluation may be necessary according to standards of care to confirm the presence of obesity-related complications as alluded to in Step 3.

Step 3. Disease Staging and Complications-centric Approach

3.1 If any obesity-related complications are identified, individuals should undergo further evaluation to stage the severity of each complication.

3.1 In many cases, the confirmation of the presence of an obesity-related complication, and the staging of the severity of the complication, can be accomplished using the information obtained at the initial "new" patient evaluation. Other complications may require additional testing as recommended by standards of care to confirm the presence of the complication and/ or to stage the severity of the complication. Table 4 proposes criteria for staging of obesity-related complications for purposes of illustration, but, in many cases, subspecialty expertise will be required for optimization of these criteria based on data.

3.2 Staging is completed for each of the identified complications using complications-specific criteria (see Table 4) and staged as:
   • Overweight and Obesity Stage 0 represent diagnoses for those patients who satisfy the anthropometric criterion, BMI 25 to 29.9 kg/m² for Overweight and BMI ≥30 kg/m² for Obesity, and who do not have obesity-related complications (Stage 0).
   • Obesity Stage 1 represents the diagnosis of obesity for those patients who satisfy the anthropometric criterion (e.g., BMI ≥25 kg/m²) and have one or more mild-to-moderate obesity related complications (but none severe).
   • Obesity Stage 2 represents the diagnosis of obesity for those patients who satisfy the anthropometric criterion (e.g., BMI ≥25 kg/m²) and have one or more severe obesity-related complications.
   • For patients with Obesity Stages 1 and 2, no distinction is made for patients with overweight or obesity based on BMI alone since excess weight in either case is adversely affecting health and all patients have 1 or more complications that can be treated by weight-loss therapy. While the prevalence of complications increases as a function of BMI, the advanced diagnostic framework will identify all individuals, whether overweight or obese, who have mild-moderate or severe complications and who will benefit from weight-loss therapy.

Step 4. Treatment: Implement AACE/ACE Obesity Management Algorithm After Diagnosis and Complication Staging are Complete

4.1 Steps 1 to 3 diagnose obesity on the basis of both anthropometric criteria and clinical criteria that reflect the impact of weight gain on health as manifested by the presence and severity of obesity-related complications. The staging of complications in Step 3 helps guide treatment decisions in the context of the Obesity Treatment Algorithm shown in Figure 1, which is part of the AACE/ACE Comprehensive Diabetes Treatment Algorithm (1). Obesity management never precludes specific complication-related treatment outside of weight-loss therapy when needed. The selection of treatment modality and intensity will require clinical judgment and individualization of therapy; however, Table 5 proposes treatment approaches based on diagnostic category that would generally apply in many individuals.

4.2 Overweight and Obesity Stage 0 are indicative of the absence of obesity-related complications. From the perspective of cardiometabolic disease, these patients have been referred to as the "healthy obese" (8,9), and, in this instance, biomechanical and other complications of obesity would similarly not be present. While therapy should be individualized and based on clinical decision-making, patients with Overweight/Obesity Stage 0 would generally be treated with lifestyle modification employing meal patterns that promote health (10), behavior modification, and increased physical activity primarily intended to prevent progressive weight gain and/or the emergence of complications in the future. More emphasis on weight reduction and hypocaloric diets may be warranted with BMI ≥30 or in patients with rapid increases in body weight. These individuals require interventions for the secondary phase of treatment/prevention of chronic disease.

Table 3
Checklist of Obesity-related Complications[a]

	Obesity-related complication	Identification based on information available in initial evaluation	Possible secondary tested needed to confirm presence of complication, stage complication, or guide therapy
☑	Metabolic Syndrome	waist circumference, blood pressure, triglycerides, HDL-c, fasting glucose (ATPIII criteria)	initial evaluation completes diagnosis; screen for cardiovascular disease
☑	Prediabetes	fasting glucose	repeat fasting glucose completes diagnosis of impaired fasting glucose, but patient should be further evaluated with 2-hour oral glucose tolerance test to identify Prediabetes due to impaired glucose tolerance or diabetes based on elevated 2-hour glucose value and/or with HbA1c; screen for cardiovascular disease
☑	T2DM	fasting glucose	overtly elevated or repeat fasting glucose completes diagnosis, but patients with moderate elevations in glycemia may require further evaluation with 2-hour oral glucose tolerance glucose value or HbA1c or both; screen for cardiovascular disease and microvascular complications
☑	Dyslipidemia	fasting triglycerides and HDL-c with lipid panel	initial evaluation completes diagnosis; lipoprotein subclasses may further define risk
☑	Hypertension	systolic and diastolic sitting blood pressures	repeat blood pressure completes diagnosis; further testing may include ambulatory blood pressure monitoring; screen for complications of hypertension
☑	NAFLD	liver examination, liver function tests	additional studies are needed for diagnosis: imaging, liver biopsy as indicated
☑	PCOS	physical exam, review of systems	additional studies are needed for diagnosis: hormonal testing
☑	Obstructive sleep apnea	physical exam, review of systems	additional studies are needed for diagnosis: neck circumference, sleep study
☑	Osteoarthritis	physical exam, review of systems	additional studies are needed for diagnosis: radiographic imaging
☑	Urinary stress incontinence	physical exam, review of systems	additional studies may be indicated: urine culture, urodynamic testing
☑	GERD	physical exam, review of systems	additional studies may be indicated: endoscopy, esophageal motility
☑	Disability/immobility	physical exam, review of systems	initial evaluation may complete diagnosis, functional testing may be needed
☑	Psychological disorder and/or Stigmatization	physical exam, review of systems	additional studies may be needed: psychological testing and evaluation
☑	Obesity secondary to genetic syndromes, hormonal disease, iatrogenic medications	physical exam, review of systems, review medications and supplements, family history	additional studies may be needed: genetic testing, hormonal testing

Other obesity-related complications or disease processes that could be treated with weight-loss therapy:
Improvement in risk of surgery and anesthesia; idiopathic intracranial hypertension/pseudotumor cerebri; primary prevention of cancer in high-risk individuals and families; secondary prevention of breast cancer; congestive heart failure; infertility; "low testosterone"/hypogonadism; back pain; lower extremity venous stasis and edema; thrombophlebitis; prior to pregnancy to improvement in maternal/fetal outcomes; chronic lung disease, including asthma; chronic kidney disease/renal protection; reductions in quality of life.

Abbreviations: BMI = body mass index; GERD = gastroesophageal reflux disease; HbA1c = glycated hemoglobin; HDL-c = high-density lipoprotein cholesterol; LDL-c = low-density lipoprotein cholesterol; NAFLD = nonalcoholic fatty liver disease; NASH = nonalchoholic steatohepatitis; PCOS = polycystic ovary syndrome; T2DM = type 2 diabetes mellitus
[a] Initial evaluation in patients with obesity (BMI ≥25 kg/m^2) includes: history, physical examination, review of systems, blood pressure, waist circumference, fasting glucose, fasting lipid panel (total cholesterol, LDL-c, HDL-c, triglycerides), creatinine, and hepatic transaminases.

Table 4
Staging of Obesity-related Complications That Can Be Improved by Weight Loss[a]

A] Prediabetes, Metabolic Syndrome, and T2DM

Stage 0 (none)	No risk factors related to insulin resistance (WC, BP, HDL-c, TG, fasting glucose). This is equivalent to CMDS 0 (9)
Stage 1 (mild-moderate)	1 or 2 risk factors (WC, BP, HDL, TG; CMDS stage 1)
Stage 2 (severe)	Prediabetes, Metabolic Syndrome, or T2DM (CMDS stages 2-4)

B] Hypertension

Stage 0 (none)	BP <130/85 mm Hg
Stage 1 (mild-moderate)	BP ≥130/85 mm Hg in absence of other risk factors
Stage 2 (severe complication)	BP target not met despite use of anti-hypertensive medication(s)
	BP ≥130/85 mm/Hg in high-risk individuals: CMDS 2-4, smoking, African, congestive heart failure

C] Hypertriglyceridemia/Dyslipidemia

Stage 0 (none)	TG <150 and HDL-c ≥40 in male and ≥50 in female
Stage 1 (mild-moderate)	TG 150-399 and/or HDL-c <40 in male and <50 in female in absence of other risk factors
Stage 2 (severe)	TG ≥400 in absence of other risk factors
	TG ≥150 and HDL-c <40 in male and <50 in female in high-risk individuals: CMDS stage 2-4

D] Sleep Apnea

Stage 0 (none)	No symptoms, AHI <5
Stage 1 (mild-moderate)	AHI 5-29 with no or mild symptoms
Stage 2 (severe)	AHI ≥30; AHI 5-29 with severe symptoms and/or clinical sequences

E] NAFLD

Stage 0 (none)	No steatosis
Stage 1 (mild-moderate)	Presence of steatosis but no inflammation or fibrosis
Stage 2 (severe)	Steatohepatitis (NASH)

F] PCOS

Stage 0 (none)	Does not meet criteria, absence of PCOS
Stage 1 (mild-moderate)	1 or 2 risk factors (WC, BP, HDL-c, TG: CMDS stage 1) and no infertility/anovulation
Stage 2 (severe)	Infertility/anovulation
	Oligomenorrhea; Menorrhagia; Prediabetes/Metabolic Syndrome/T2DM (CMDS stage 2-4)

G] Osteoarthritis

Stage 0 (none)	No symptoms and no radiographic joint changes
Stage 1 (mild-moderate)	Mild-moderate symptoms and functional impairment (e.g., validated questionnaire) and/or mild-moderate anatomical joint changes
Stage 2 (severe)	Moderate-severe symptoms and functional impairment (e.g., validated questionnaire) and/or moderate-severe anatomical joint changes; S/P knee or hip placement surgery

H] Stress and Urge Urinary Incontinence

Stage 0 (none)	No symptoms and/or normal rodynamics
Stage 1 (mild-moderate)	Mild-moderate symptom severity score
Stage 2 (severe)	Severe symptom severity score

I] GERD

Stage 0 (none)	No symptoms or findings
Stage 1 (mild-moderate)	Mild-moderate symptoms
Stage 2 (severe)	Severe symptoms; Erosive esophagitis, Barrett's Esophagus (if not accompanied by progressive weight loss)

J] Disability/Immobility

Stage 0 (none), Stage 1 (mild-moderate), Stage 2 (severe)

K] Psychological Disorder/Stigmatization

Stage 0 (none), Stage 1 (mild-moderate), Stage 2 (severe)

L] Other Complications

Specific staging criteria could also be established for the following complications and other disease processes that can be prevented and/or treated using weight loss therapy:
• Idiopathic intracranial hypertension/pseudotumor cerebri; primary prevention of cancer in high-risk individuals and families; secondary prevention of breast cancer; congestive heart failure; infertility not associated with PCOS; "low testosterone"/hypogonadism; sexual function related to the mechanical aspects of coitus; back pain; lower extremity venous stasis and edema; thrombophlebitis; deep vein thrombosis; gastric ulcers; maternal/fetal risk of pregnancy; improvement in risk of surgery and anesthesia; chronic lung disease including asthma; gout; chronic kidney disease/renal protection; poor quality of life.

Abbreviations: AHI = apnea hypopnea index; BP = blood pressure; CMDS = cardiometabolic disease stage; GERD = gastroesophageal reflux disease; HDL-c = high-density lipoprotein cholesterol; LDL-c = low-density lipoprotein cholesterol; NAFLD = nonalcoholic fatty liver disease; NASH = nonalchoholic steatohepatitis; PCOS = polycystic ovary syndrome; T2DM = type 2 diabetes mellitus; TG = triglycerides; WC = waist circumference

[a] While there is an evidence base for the complications-specific criteria below that are used to stage the severity of obesity-related complications, several criteria may require additional expert scrutiny, critique, and research for optimization.

Table 5 Diagnosis and Management of Obesity[a]			
Diagnosis		**Complications-specific staging and treatment**	
Step 1	Step 2	Step 3	Step 4
Anthropometric component (BMI[b])	Clinical component	Complications-specific staging[c]	Suggested therapeutic interventions[d] (based on clinical judgment)

25-29.9	Presence or absence of obesity-related complications
	• Metabolic conditions
	  ○ Prediabetes
	  ○ Metabolic syndrome
	  ○ T2DM
	  ○ Hypertension
	  ○ Dyslipidemia
	  ○ NAFLD/NASH
	• Sleep apnea
	• PCOS
	• Osteoarthritis
	• Stress incontinence
	• GERD
	• Disability/immobility
	• Psychological disorder or stigmatization
		Overweight stage 0	• Healthy meal pattern/physical activity
			• Lifestyle modification/reduced calorie meal plan/physical activity

≥30		Obesity stage 0	• Lifestyle modification/reduced calorie meal plan/physical activity • Intensive behavioral and lifestyle therapy
≥25		Obesity stage 1 (1 or more mild-moderate complication)	• Lifestyle modification/reduced calorie meal plan/physical activity • Intensive behavioral and lifestyle therapy • Consider adding weight-loss medications to lifestyle therapy program if BMI ≥27[e]
≥25		Obesity stage 2 (at least 1 severe complication)	• Intensive behavioral and lifestyle therapy • Consider adding weight-loss medications to lifestyle therapy program if BMI ≥27[e] • Consider bariatric surgery in patients with BMI ≥35

Abbreviations: BMI = body mass index; GERD = gastroesophageal reflux disease; NAFLD = nonalcoholic fatty liver disease; NASH = nonalchoholic steatohepatitis; PCOS = polycystic ovary syndrome; T2DM = type 2 diabetes mellitus

[a] All patients with BMI ≥25 have either Overweight stage 0, Obesity stage 0, Obesity stage 1, or Obesity stage 2 depending on the initial clinical evaluation for presence and severity of complications. These patients should be followed over time and evaluated for changes in both anthropometric and clinical diagnostic components. The diagnoses of Overweight/Obesity stage 0, Obesity stage 1, and Obesity stage 2 are not static, and disease progression may warrant more aggressive weight loss therapy in the future. Patients with increased BMI due to muscularity should be excluded.

[b] In certain ethnic populations, waist circumference should be assessed if the BMI is 23 to 25 kg/m^2. If the waist circumference is elevated using ethnic population-specific cutoff values, this positive risk factor identifies a patient who could benefit from weight loss and per se meets the criteria for an Obesity stage 1 diagnosis. Waist circumference is also used in the clinical evaluation of all patients for Metabolic Syndrome.

[c] Stages are determined using criteria specific to each obesity-related complication; stage 0 = no complication; stage 1 = mild-to-moderate; stage 2 = severe.

[d] Treatment plan should be individualized; suggested interventions are appropriate for obtaining the sufficient degree of weight loss generally required to treat the obesity-related complication(s) at the specified stage of severity.

[e] BMI ≥27 is consistent with the prescribing information mandated by the Food and Drug Administration for weight-loss medications.

4.3 Obesity Stage 1 is indicative of the presence of 1 or more obesity-related complications, each of which are mild-moderate in severity, based on complication-specific criteria. Effective treatment of these complications can generally be accomplished by moderate weight loss (e.g., 3-10% weight loss). While therapy should be individualized based on clinical judgment, in general, patients with Obesity Stage 1 would be effectively treated with intensive lifestyle/behavioral therapy or the combination of a lifestyle modification program that emphasizes caloric reduction in conjunction with a weight-loss medication. Obesity Stage 1 includes both overweight and obese patients with 1 or more mild-moderate complications that can be ameliorated by weight loss. The emphasis, therefore, is on improving the patient's health and treating both weight and weight-related complications and not just weight or the BMI level per se. Therefore, these individuals require interventions for the tertiary phase of treatment/prevention of chronic disease, intended to lessen disease severity and treat complications.

4.4 Obesity Stage 2 is indicative of the presence of 1 or more obesity-related complications that are severe based on complication-specific criteria (see Table 3). Stage 2 complications generally have a more adverse impact on individual health, and/or require more aggressive obesity management with a greater degree of weight loss (e.g., ≥10% weight loss) in order to effectively or optimally treat the obesity-related complication. While therapy should be individualized and based on judgment, in general, patients with Obesity Stage 2 would effectively be treated with intensive lifestyle/behavioral therapy in conjunction with a weight-loss medication or bariatric surgery. Obesity Stage 2 includes both overweight and obese patients with 1 or more severe complications that can be ameliorated by weight loss. The emphasis, therefore, is on improving the patient's health and treating complications and not their BMI level per se. As indicated for Obesity Stage 1, these individuals require interventions for the tertiary phase of treatment/prevention of chronic disease.

4.5 Patients meeting the diagnosis for Obesity, whether Stage 0, 1, or 2, have a lifelong disease and will need ongoing follow-up and re-assessment for both anthropometric and clinical components of the diagnosis. For example, a current diagnosis of Obesity Stage 0 does not assure the perpetual absence of complications; these patients may convert to Stage 1 or 2 in the future, indicating the need for more aggressive weight-loss therapy. Similarly patients who are Overweight with no complications are at risk of future weight gain in our obesogenic environment and thus require lifestyle modifications and ongoing follow-up.

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