

**ADIPOSIITY-BASED CHRONIC DISEASE AS A NEW DIAGNOSTIC TERM:
THE AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS AND
AMERICAN COLLEGE OF ENDOCRINOLOGY POSITION STATEMENT**

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This document represents the official position of the American Association of Clinical Endocrinologists and 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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**A complete list of the Reviewers of the AACE/ACE Obesity Committee Reviewers can be found in the Acknowledgment.*

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ABSTRACT

The American Association of Clinical Endocrinologists (AACE) and American College of Endocrinology (ACE) have created a chronic care model, advanced diagnostic framework, clinical practice guidelines, and clinical practice algorithm for the comprehensive management of obesity. This coordinated effort is not solely based on body mass index as in previous models, but emphasizes a complications-centric approach that primarily determines therapeutic decisions and desired outcomes. *Adiposity-Based Chronic Disease* (ABCD) is a new diagnostic term for obesity that explicitly identifies a chronic disease, alludes to a precise pathophysiologic basis, and avoids the stigmata and confusion related to the differential use and multiple meanings of the term “obesity.” Key elements to further the care of patients using this new ABCD term are: (1) positioning lifestyle medicine in the promotion of overall health, not only as the first algorithmic step, but as the central, pervasive action; (2) standardizing protocols that comprehensively and durably address weight loss and management of adiposity-based complications; (3) approaching patient care through contextualization (e.g., primordial prevention to decrease obesogenic environmental risk factors and transculturalization to adapt evidence-based recommendations for different ethnicities, cultures, and socio-economics); and lastly, (4) developing evidence-based strategies for successful implementation, monitoring, and optimization of patient care over time. This AACE/ACE blueprint extends current work and aspires to meaningfully improve both individual and population health by presenting a new ABCD term for medical diagnostic purposes, use in a complications-centric management and staging strategy, and precise reference to the obesity chronic disease state, divested from counterproductive stigmata and ambiguities found in the general public sphere. (*Endocr Pract.* 2017;23:372-378)

Abbreviations:

AACE = American Association of Clinical Endocrinologists; **ABCD** = Adiposity-Based Chronic Disease; **ACE** = American College of Endocrinology; **BMI** = body mass index; **CPG** = clinical practice guidelines; **HCP** = health care professionals

THE OBESITY PROBLEM

The United States is in the midst of an obesity epidemic. This problem is complicated, prevalent, and not adequately addressed by current interventions (1-3). Pragmatically, the management of obesity, both for individuals and the population at large, can be approached by addressing 3 principal characteristics of obesity intervention:

1. **Impact on Health:** due to clinically relevant and progressive adiposity-based complications in many but not all patients;
2. **Sustainability:** related to costly, disease-oriented, fragmented, and varying health care infrastructures and the high prevalence of obesity; and
3. **Therapeutic Nihilism:** on the part of both health care professionals (HCP) and the general public, based on beliefs that patients with obesity will have poor responses to current efforts because obesity is solely a lifestyle choice rather than a chronic disease with important behavioral components.

In this position paper, the American Association of Clinical Endocrinologists (AACE) and American College of Endocrinology (ACE) further evolve their blueprint to improve obesity care by presenting a new diagnostic term and conceptual framework.

A. Obesity as an Adiposity-Based Chronic Disease (ABCD)

“Obesity” is currently applied by most HCP, regulators, and third-party payers to any person with a body mass index (BMI) of 30 kg/m² or greater. For the most part, the general public, and indeed most HCP, are confused about this definition and the related health implications of obesity since the diagnosis is based solely on an anthropometric measurement. In fact, in the 2014 AACE/ACE Consensus Conference on Obesity, participants representing 4 stakeholder pillars (biomedical; government/regulatory; health industry and economics; and professional organizations, education, and research) were unable to embrace “obesity” as an actionable term because the relationship of the term to the health of individuals was obscure (4). Furthermore, the term obesity carries with it a great deal of stigmatization in the public domain that has negative implications pertaining to the personal character of patients with the disease, even after obesity was recognized as a disease state in 2012 (5). Patients with excess adiposity often harbor guilt from being overweight or obese (6). Indeed, the predominant sentiment associated with the term obesity in social media is derogatory and often cloaked in disparaging humor, invariably pointing to weight bias (7). Although the diagnosis of obesity is typically interpreted as being “bad” for one’s health, few recognize the far-reaching integrative physiology centering on body fat and affecting quality of life and longevity. The word “obesity” itself conveys little about the conditions associated with excess adiposity. Scientifically, BMI can be used as an office screening tool to estimate adiposity, but it is an anthropometric measure that clearly underperforms as a predictor of health and sole guide for clinical decision-making (8-10). Objections to the exclusive use of BMI as a screening tool or diagnostic term include, but are not limited to, varying cut-offs with different ethnicities, effect of increased or decreased

muscle mass, and independent cardiometabolic risks associated with waist circumference (WC). AACE/ACE has promoted a “complications-centric” approach to the diagnosis and management of patients with obesity (3,8,11). However, a new nomenclature is warranted that conceptualizes obesity as a chronic disease state leading to characteristic adiposity-based complications, and encompasses a specific medical diagnostic term reflecting the adiposity-based pathophysiologic process.

The term “adiposity” directly refers to adipocytes and adipose tissue, which in the context of ABCD, incorporates an impact on health that can relate to quantity, distribution, and/or function of adipose tissue. The quantity of body fat mass can correlate with certain adverse clinical endpoints or adiposity-based complications but is inadequately reflected by BMI (8-10). Advanced body imaging promises a better means to assess adiposity, and investigational studies are underway (10,12). The distribution of body fat also correlates with relevant pathophysiology such as insulin resistance and inflammation. For example, the relative accumulation of fat in the intra-abdominal depot, and accumulation of lipid within hepatocytes (i.e., nonalcoholic fatty liver disease) and muscle cells, is linked to insulin resistance, development of type 2 diabetes, and cardiovascular disease. On the other hand, gluteo-femoral fat accumulation is independently associated with a protective effect on glucose- and lipid-related cardiometabolic risk (13-15). The func-

tional attributes of fat are governed by the adipocyte secretome, as well as involving other cytokine, hormonal, and humoral factors, and will be delineated by emerging technologies in genetic/genomic analyses (16). Dysregulated secretion of these factors can affect multiple organ systems that correlate with adiposity-based complications. In short, adiposity is an encompassing term that offers advantages in health messaging and scientific research.

A disease state results when the severity of abnormal adiposity translates into a physiologic process and symptom burden through definable mechanisms. Chronic disease occurs when a disease state persists for more than 3 months (defined by the National Center for Health Statistics [17]), and is characterized by adaptive and maladaptive processes, interacting and evolving toward a steady state, which may not be reached and which can obfuscate the primary etiology (18). For example, subtle changes in adiposity distribution can drive events that lead to metabolic syndrome, increased body weight, vascular inflammation, heart disease, and cognitive changes, eventually creating a complex medical state that conceals the initial problems with fat deposition. Hence, what has been generally termed obesity can now be reconsidered as an ABCD based upon a preponderance of evidence (Fig. 1) (3,4,8). This new terminology of obesity offers distinct opportunities to demystify the imprecise term “obesity” with a diagnostic term that describes the disease state. The clinical use of ABCD has the potential to

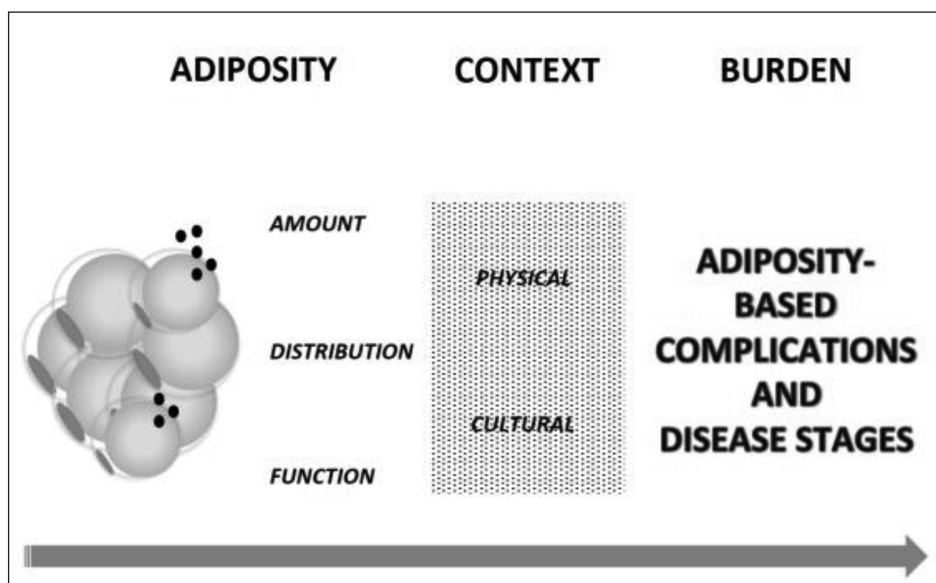


Fig. 1. Translating adiposity and context into chronic disease burden^a

^a Adiposity is described by total body fat (body mass index, plethysmography, and imaging), distribution of fat (waist circumference, imaging), and secretory function (biochemical, molecular analyses). This phenotype, resulting from abnormalities in adipose mass, distribution, and function is contextualized by the physical (“built” or human-made) and nonphysical (e.g., culture, beliefs, customs, and socio-political-economic) environment. The result is an “*adiposity-based chronic disease*” (ABCD) with clinically relevant and actionable adiposity-based complications. These adiposity-based complications are reviewed in references 3 and 6, determine disease stages, and are managed with structured lifestyle interventions, pharmacotherapy, and/or bariatric procedures (surgical and nonsurgical) based on severity.

promote improvements in patient care, appropriate screening for associated health comorbidities, and structured treatment protocols. We propose that the term ABCD be used for medical diagnostic purposes and precise reference to the chronic disease state, with related disease stages, divested from the stigmata and ambiguity associated with the word obesity in the general public sphere.

B. The Central Role for Lifestyle Medicine

By its very nature, chronic disease is complex and can be configured as a biological network of interactions and relationships (18). Obesity interventions targeting single pathways or mechanisms may be able to cause some scientifically predictable changes (19), but durable benefits are frequently elusive. The current treatment paradigm for obesity is to focus on weight loss (reducing BMI and/or WC) and identify and specifically treat adiposity-based complications. This is executed with often meager attempts at achieving long-term healthy eating patterns and increased physical activity, as well as inconsistent use of pharmacotherapy and poorly defined clinician/patient thresholds for bariatric procedures.

Lifestyle medicine is the nonpharmacologic, nonsurgical/procedural management of chronic disease (Table 1) (18). With reference to the ABCD term in a complications-centric framework of care, lifestyle medicine offers the advantage of exerting a broad set of network-based interventions. However, the optimal application of lifestyle medicine in clinical practice requires scientific study and validation, much more effort in HCP education and training for standardized evidence-based protocols, and clinical implementation and monitoring with fair reimbursement strategies. Lifestyle medicine will need to address the classic prevention stages of chronic disease management: primordial (decreasing disease risk on a population level), primary (decreasing disease in at-risk patients), secondary (decreasing complications in patients with early disease), and tertiary (decreasing morbidity and mortality in patients with complications and/or late disease) (3). Furthermore, the conversational message of lifestyle medicine is framed positively as promoting “health”; can be applied to all patients with any disease type or stage; includes human behavior, social reform, and environmental change; and should be adopted by an entire HCP team (20,21).

C. Standardization of ABCD Complications-Centric Protocols

The AACE/ACE obesity chronic care model consists of 4 main parts: contextualization (healthy environment and reformed health care system), a prepared obesity practice, a motivated or “activated” patient, and assessment of outcomes (individual- and population-based with subsequent innovations) (3). Pragmatically, there are several key actions for comprehensive patient care using the ABCD term. First, the patient must be “activated” for change by

implementing proven behavioral medicine skills. Patient activation is the linchpin for managing ABCD as a complex clinical problem, and this aspect of behavioral medicine needs to be a focus of medical education. Next, the relevant drivers and associated abnormalities in adipose tissue need to be identified pertaining to mass, distribution, and function (e.g., increased fat mass [history and physical examination], insulin resistance and ectopic lipid [using available biochemical testing and imaging], and adipose tissue inflammation and abnormal secretory function affecting cardiovascular and metabolic disease risk [may require laboratory testing not widely available]). In addition, an evaluation of the risk, presence, and severity of adiposity-based complications within the AACE/ACE framework [8]) should be performed (i.e., stage 0 ABCD has no identifiable adiposity-based complications, stage 1 has mild to moderate adiposity-based complications, and stage 2 has severe adiposity-based complications). Lastly, an individualized care plan needs to be designed that always includes structured lifestyle change and can include pharmacotherapy, endoscopic procedures, or bariatric surgery based on the presence and severity of adiposity-based complications, as well as the degree of weight loss needed to ameliorate adiposity-based complications (ranging from at least 3% to over 15% depending on the specific adiposity-based complications [3]). Unfortunately, evidence-based protocols to specifically address ectopic lipid and an abnormal adipocyte secretome are currently lacking (the AACE/ACE has published management recommendations for lipodystrophy, which is related to ABCD based on the hypothesis that dysfunctional fat deposition with decreased or absent areas of adipose tissue increases the risk for ectopic lipid deposition, insulin resistance, and metabolic syndrome [22]). Subtle, evidence-based decision-making for specific adiposity-based complications in various real-life settings is provided in the AACE/ACE obesity clinical practice guidelines (CPG) (3); however, portfolios of more specific ABCD protocols will need to be standardized so that they can have the desired broad and significant impact on both individual- and population-based health promotion.

The translation of specific abnormalities of adipose tissue into the clinical presentation and care plan requires intermediation or contextualization (Fig. 1) taking into account both the physical (“built” or human-made) and nonphysical (e.g., culture, beliefs, customs, and socio-political-economic) environment (Table 2). Realistically, in order for standardized, evidence-based protocols to be implemented successfully, they must be adapted for the patient within their unique context. In fact, the transculturalization process, which adapts evidence-based recommendations from one culture and/or ethnicity to another, and recently implemented by the AACE/ACE in Latin America (23), is inherently part of personalized/precision medicine and will be included in care strategies using the ABCD term.

D. Strategies and Tactics for Successful ABCD Implementation

The approach to care of patients with obesity has made enormous strides forward in recent years, but current management is still suboptimal, perhaps due to poor coordination of medical care with the legislative-regulatory environment, as well as problems with public education, health care access, and stigmatization (24).

The AACE/ACE is dedicated to advancing preventive and therapeutic practices for obesity that improve health for all people and believe that the adoption of ABCD as

a precise pathophysiologic term referring to the medical diagnosis of obesity and importance of addressing body fat and related adiposity-based complications will advance this goal. Strategically, this ABCD conceptual approach is not a rebranding of obesity per se, but a novel approach that incorporates better health messaging for HCP and patients. This approach spans primordial/primary prevention to decrease the risks and adverse effects of abnormal adiposity mass, distribution, and/or function, to secondary/tertiary prevention to decrease the risks and adverse effects of adiposity-based complications. For instance,

Table 1
Components of Lifestyle Medicine

| Component | Description |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Healthy eating patterns | Aggregation of foods consumed over a specified time and associated with clinical benefit; addresses disordered eating with counseling, group therapy, CBT, and stimulus management |
| Physical activity | Body movements (e.g., aerobic, strength training, sports, exercise, walking); can be employment-related and associated with reduced sedentary activity |
| Body composition | Target %fat mass and fat distribution; implicates muscle mass and intracellular lipid storage |
| Sleep hygiene | Amount and quality of sleep |
| Stress reduction | Relaxation, yoga, meditation, counseling, and CBT |
| Tobacco cessation | Counseling and CBT |
| Alcohol moderation | Spectrum of alcohol use disorder; counseling, and CBT |
| Substance abuse | Counseling and CBT |
| Mood | Counseling, psychotherapy, medical therapy, and physical activity |
| Behavior | Focus on healthy/unhealthy behaviors; CBT |
| Community engagement | Provide local resources (e.g., houses of worship, schools, neighborhood centers) |
| Transculturalization | Adapt recommendations for different ethnicities/cultures |

Abbreviation: CBT = cognitive-behavioral therapy

Table 2
ABCD Contextualization Factors^a

| Category | Features |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Physical | “Built” or human-made environment Healthy/unhealthy food availability in restaurants, schools, workplace, and stores Food and water supply, food sourcing, food “deserts,” pesticides, and endocrine disruptors Walking paths, public/private gyms, school fitness programs, green spaces, and parks Building design (elevators versus stairs), distances to walk, and handicapped access Security personnel, safe routes to schools, safe venues for exercise, city planning, community design, and energy supply |
| Nonphysical | Culture, ethnicity, belief systems, and socio-political-economic factors Attitudes and customs toward food and eating, food policy and politics, and religious dictates Affordability of healthy foods (e.g., fresh fruits, fresh vegetables, and whole grains) Use of unhealthy, processed, and fast foods due to economics, availability, and affordability Attitudes and customs toward physical activity and exercise (e.g., not sweating in public) Screen time (e.g., television, games, computer) Home and workplace stress including personal safety and crime (e.g., decreased sleep and increased use of comfort foods) Disparities in health care access (gender and socio-economic class) Discrimination and stigmatization with obesity Confusion and ambiguity centered on the term “obesity” |

^a See reference 23.

special populations such as children, adolescents, and young adults who are metabolically healthy will need to be screened for adiposity derangements so appropriate protocols can be initialized to prevent adiposity-based complications. The ABCD approach includes formal behavioral science and is in adherence with the AACE/ACE obesity chronic care model and CPG, which prioritize patient activation for change, practice preparedness, protocol formulation with standardization, and relevant contextual adaptations. The AACE/ACE also endorses a continued, concerted, and vigorous effort regarding health policy and the legislative agenda pertaining to reimbursement for structured lifestyle medicine and indeed all evidence-based therapeutic modalities for patients with ABCD. Tactically, to continue to address the obesity epidemic beyond CPG, the AACE/ACE is developing varied and enduring educational materials (e.g., web-based, printed, and face-to-face) and conferences, and with its partner professional organizations, continues to press on with legislative and regulatory initiatives at the local, state, and federal levels (see www.aace.com). More specifically, the AACE/ACE will spearhead clear definition and positioning of ABCD in the human disease ontology database (25) and then creation of relevant complication-based International Classification of Diseases, 10 revision coding to facilitate HCP reimbursements, routine implementation, and realizable quality metrics. However, a major challenge to using the ABCD term is identification of appropriate, available, and affordable markers/metrics reflecting the impact of adiposity on health. To be clear, the ABCD approach does not eliminate BMI as this computation still confers value for many patients with excess adiposity. However, further research is needed that can now focus on specific tools to quantitate derangements in adiposity mass, distribution, and function. Overall, to combat this prevalent, chronic, and injurious disease, HCP will need to incorporate a conceptual approach to management that goes beyond a singular focus on BMI. The adoption of the new ABCD diagnostic term is a clear step forward.

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Dr. Mechanick has received honoraria for program development by Abbott Nutrition International, and honoraria for lectures from the NCD Pre-Disease Forum.

Dr. Garvey has served on scientific advisory boards for Novo Nordisk, Alexion, Janssen, Vivus, Eisai, Takeda, Astra Zeneca, and Merck, and research sponsored by Merck, Astra Zeneca, Weight Watchers, Elcelyx, Lexicon, Novo Nordisk, Pfizer, and Sanofi. He is also a stockholder of Bristol-Myers-Squibb, Eli Lilly, Isis, Merck, Novartis and Pfizer.

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