

**AMERICAN ASSOCIATION OF CLINICAL  
ENDOCRINOLOGISTS  
AND AMERICAN COLLEGE OF ENDOCRINOLOGY**

**Clinical Practice Guidelines for  
Comprehensive Medical Care of Patients  
with Obesity**

**AACE Comprehensive Clinical Practice Guidelines for  
Medical Care of Patients with Obesity: an evidence-  
based approach to individualized medical management**

<b>Tim Garvey</b>	Introduction Rationale, mandate, and process for the CPG. Overview of questions addressed.
<b>Karl Nadolsky</b>	Anthropometric and Clinical Components to the Diagnosis: measurement of adiposity and impact on patient health – What are we treating?
<b>Ania Jastreboff</b>	Benefits of weight loss therapy – Why we are treating it?
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<b>Jeff Mechanick</b>	A patient-centered approach for individualization of pharmacotherapy
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**AACE Comprehensive Clinical Practice Guidelines  
for Medical Care of Patients with Obesity:  
*an evidence-based approach to individualized medical  
management***

## **Rationale, Mandate, and Process**

### **W. Timothy Garvey, MD, FACE**

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University of Alabama at Birmingham  
Director, UAB Diabetes Research Center  
GRECC Investigator and Staff Physician, Birmingham VA Medical Center

## **AACE and Obesity Medicine Chronological List of Contributions to-Date**

1. **AACE position statement on obesity and obesity medicine.**  
Mechanick JI, Garber AJ, Handelsman Y, Garvey WT. *Endocr Pract.* 2012; 18(5):642-648
2. **AACE/TOS/ASMBS Clinical practice guidelines for the perioperative nutritional, metabolic, and nonsurgical support of the bariatric surgery patient--2013 update.**  
Mechanick JI, Youdim A, Jones DB, Garvey WT, et al. *Endocr Pract.* 2013; 19(2):337-72.
3. **AACE/ACE Comprehensive Diabetes Management Algorithm – 2013.**  
Garber AJ, Abrahamson MJ, Barzilay JI, et al. *Endocr Pract.* 2013; 19(2):327-336.
4. **AACE/ACE Consensus Conference on Obesity: building an evidence base for comprehensive action.** Washington DC, March, 2014.  
Garvey WT, Garber AJ, Mechanick JI, et al. *Endocr Pract.* 2014; 20(9):956-976.
5. **AACE/ACE Position Statement on the 2014 Advanced Framework for a New Diagnosis of Obesity as a Chronic Disease.**  
Garvey WT, Garber AJ, Mechanick JI, et al. *Endocr Pract.* 2014; 20(9):977-989.
6. **AACE/ACE Comprehensive Diabetes Management Algorithm – 2016.**  
Garber AJ, Abrahamson MJ, Barzilay JI, et al. *Endocr Pract.* 2016; 22(1):84-113.
7. **AACE/ACE Transculturization recommendations for developing Latin American practical algorithms in endocrinology – proceedings 2015 Pan American Workshop.**  
Mechanick JI, Harrell RM, Allende-Vigo MZ, et al. *Endocr Pract.* 2016; 22(4):476-501.

## Plethora of Obesity Management Guidelines

AACE (Endo Pract, 2014)  
NHLBI  
AHA/ACC/TOS (Circulation, 2014)  
ASBP/OMA ([www.OMAcademy.org](http://www.OMAcademy.org))  
Endocrine Society (JCEM, 2015)  
Canadian Task Force (CMAJ, 2015)  
NICE Guidelines ([www.nice.org.uk](http://www.nice.org.uk))

## Limitations of Obesity Guidelines regarding the promotion of high quality and rational care for the patient with obesity

1. Multiple guidelines create confusion among health professionals
2. Not all guidelines are evidence based
3. Not all guidelines are comprehensive
3. Evidence-based guidelines built around selected questions only when strong scientific evidence is available (e.g., RCTs) and may not be meaningful or translatable to actual patient care
4. Guidelines may not consider the totality of evidence pertinent to management issues
5. Obesity Medicine lacks a comprehensive evidence-based guidelines that is translatable to real-world clinical care of patients with obesity

## NICE Guidelines

National Clinical Guideline Centre -- United Kingdom  
National Institute for Health and Care Excellence  
November 2014  
<http://www.nice.org.uk/guidance/ph53>

Consider pharmacological treatment only after dietary, exercise and behavioural approaches have been started and evaluated.

Consider drug treatment for people who have not reached their target weight loss or have reached a plateau on dietary, activity and behavioural changes.

### AACE/ACE Clinical Practice Guidelines for Comprehensive Medical Care of Patients with Obesity

## The Rationale

- Obesity continues to exact a large burden of morbidity, mortality, and social costs worldwide despite exciting advances in lifestyle therapy, pharmacotherapy, and bariatric surgery.
- In general, health care professionals have been poorly trained in the pathophysiology and management of obesity, and are in need of clear and effective algorithms to guide care
- Regulators and health care systems do not have a clear appreciation of the benefits and rationale for medical care of obesity
- Existing guidelines have not produced consensus for a rational approach to management with clear understanding of treatment goals, markers of clinical success, and desired outcomes

## AACE/ACE Clinical Practice Guidelines for Comprehensive Medical Care of Patients with Obesity

# The Rationale

### THEREFORE:

- A comprehensive, evidenced-based, care model is needed that addresses: (i) all aspects of diagnosis, evaluation, treatment decisions, and treatment goals, (ii) is applicable to real-world patient care, and (iii) is designed to optimize benefit and risk based on defined outcomes that reflect impact of treatment on the health of the patient .

# The Mandate

- In 2015, the President of AACE, in consultation with the AACE Executive Committee, charged that an evidence-based clinical practice guidelines (CPGs) be developed for the management of patients with obesity
- That the CPGs be evidence-based, and strictly adhere to the methodology for guidelines development as delineated in the AACE Protocol for Standardized Production of Clinical Practice Guidelines\*
- That the CPGs address the totality, multiplicity, and complexity of issues required to provide effective, comprehensive obesity management applicable to real-world patient care.

\* Mechanick JJ, Camacho PM, Garber AJ, et al. American Association of Clinical Endocrinologists and American College of Endocrinology Protocol for Standardized Production of Clinical Practice Guidelines, Algorithms, and Checklists - 2014 Update and the AACe G4G Program. *Endocr Pract.* 2014;20(7):692-702.

## AACE Guidelines Methodology

- **Selection of Team.**  
The selection of the chair, primary writers, and reviewers was made by the President of AACE based on credentials and expertise.
- **Multiplicities of Interests.**  
Disclosed and vetted by the AACE Publications Committee; No appointee is employed by industry, and there was no involvement of industry.
- **Consider the Totality of the Evidence.**  
(i) emphasis on strong evidence including all relevant RCTs and meta-analyses;  
(ii) inclusion of relevant cohort studies, nested case-control studies, and case series; and (iii) inclusion of reviews and mechanistic studies when appropriate.
- **Use *a priori* AACE methodology.**  
Map strength of evidence to recommendation grades as established in the AACE/ACE Protocol for Standardized Production of Clinical Practice Guidelines
- **Relevance.**  
An orientation on questions that are directly relevant to patient care.
- **Review and Consensus.**  
Employment of a multilevel review process and high level of diligence.

## Writing Task Force

W. Timothy Garvey, MD, FACE (Chair)

Jeffrey I. Mechanick, MD, FACP, FACE, FACN (Co-Chair)

Elise M. Brett, MD, FACE, CNSC

Alan J. Garber, MD, PhD, FACE

Daniel L. Hurley, MD, FACE

Ania M. Jastreboff, MD, PhD;

Karl Nadolsky, DO

Raymond Plodkowski, MD

## Reviewers

AACE Obesity Scientific Committee

Fida Bacha, MD	Nancy Bohannon, MD, FACP, FACE
George A. Bray, MD, MACP, MACE	Michael Bush, MD
Felice Caldarella, MD, FACP, CDE, FACE	Rhoda Cobin, MD, MACE
Daniel Einhorn, MD, FACP, FACE	Ken Fujioka, MD
J. Michael Gonzalez-Campoy, MD, PhD	Yehuda Handelsman, MD, FACP, FACE
Robert R. Henry, MD, FACE	Janet B. McGill, MD, FACE
Travis McKenzie, MD	Etie S. Moghissi, MD, FACP, FACE
Domenica M. Rubino, MD	Sunil Wimalawansa, MD, PhD, FACE
Farhad Zangeneh, MD, FACP, FACE	

Special External Reviewer: Donna H. Ryan, MD, FACP, FTOS

## The Questions

- A series of questions formed the basis for review of evidence. Clinical recommendations were then based on the evidence review pertinent to each question.
- The questions reflected the multiple aspects of management that must be addressed by clinicians as they evaluate, screen, and diagnose patients with obesity; establish a clinical database; make individualized treatment decisions; and assess therapeutic outcomes.
- The primary writing team drafted questions and, following multiple and interactive discussions, arrived at a consensus for the final questions that were subjected to evidence review
- The strength of each recommendation is commensurate with the strength of evidence. In this way, these CPGs marshal the best existing evidence to address the key questions and decisions facing clinicians in the real-world practical care of patients with obesity.

## The Process

1. The chair assigned each question to a member of the task force writing team.
2. Team members executed a standardized systematic electronic search of the published literature using the Cochrane Library and PubMed.
3. The mandate was to include all studies that materially impact the strength of the evidence level, including all RCTs and meta-analyses as well as relevant nonrandomized interventions, cohort studies, and case-control trials, surveillance studies, case series, and studies of disease mechanisms.
4. Task force members summararily described the evidence relevant to each question, emphasizing references that materially affected the strength-of-evidence assessment.
5. Task force members also formulated recommendations based on the evidence in response to each question.
6. Literature references and recommendations were graded based on evidence level.
7. The CPGs were critiqued by the task force and revised for consensus approval.
8. These CPGs were critically reviewed by the AACE Obesity Scientific Committee, the special external reviewer, the AACE Publications Committee, the AACE Board of Directors, and the AACE Executive Committee. Where appropriate, revisions were incorporated at each step of this review process.

### Evidence-Based Review: Assessing the Strength of the Evidence

Evidence Level (References)		Strength of Recommendation
EL 1	<ul style="list-style-type: none"> <li>• Randomized controlled trial</li> <li>• Meta-analysis of randomized controlled trials</li> </ul>	<b>A</b> Strong
EL 2	<ul style="list-style-type: none"> <li>• Nonrandomized controlled trial ;</li> <li>• Meta-analysis of nonrandomized trials</li> <li>• Case-controlled trials</li> <li>• Prospective cohort study;</li> <li>• Retrospective case-control study</li> </ul>	<b>B</b> Intermediate
EL 3	<ul style="list-style-type: none"> <li>• Cross-sectional study;</li> <li>• Surveillance study;</li> <li>• Consecutive case series</li> </ul>	<b>C</b> Weak
EL 4	<ul style="list-style-type: none"> <li>• Theory, opinion, consensus, review, or preclinical study</li> </ul>	<b>D</b> Not Evidence Based

Mechanick JI, Camacho PM, Garber AJ, et al. AACE/ACE Protocol for Standardized Production of Clinical Practice Guidelines, Algorithms, and Checklists - 2014 Update and the AACe G4G Program. *Endocr Pract.* 2014;20(7):692-702.

## The Deliverables

- 9 Broad Questions
- 73 Total questions (a priori) and 1 post-hoc question
- 1,790 reference citations
- 123 Clinical Practice Recommendations
- 160 Specific Statements
- 83.1% of Recommendations are Grade A (53%) or B (30%)

### The AACE/ACE Clinical Practice Guidelines for Comprehensive Medical Care of Patients with Obesity

#### Complementarity with other guidelines

Society	Subject Area	Title	Reference
AACE, TOS, ASMBS	Bariatric Surgery	Clinical practice guidelines for the perioperative nutritional, metabolic, and nonsurgical support of the bariatric surgery patient—2013 update	Mechanick JJ, Youdim A, Jones DB, et al. <i>Endocr Pract.</i> 2013; 19(2):337-372.
AACE/ACE, TOS	Healthy Eating	Clinical practice guidelines for healthy eating for the prevention and treatment of metabolic and endocrine diseases in adults	Gonzalez-Campoy JM, St Jeor ST, Castorino K, et al. <i>Endocr Pract.</i> 2013; 19(5):875-887
Endocrine Society	Obesity (iatrogenic medication-induced)	Pharmacological management of obesity: an Endocrine Society clinical practice guideline.	Apovian CM, Aronne LJ, Bessesen DH, et al. <i>J Clin Endocrinol Metab.</i> 2015; 100(2):342-362.
AACE/ACE	Diabetes (and obesity)	Comprehensive Type 2 Diabetes Management Algorithm - 2016	Garber AJ, Abrahamson MJ, Barzilay JJ, et al. <i>Endocr Pract.</i> 2016; 22(1):84-113.
ACSM/ADA	Physical Activity	Exercise and type 2 diabetes: joint position statement	Colberg SR, Albright AL, Blissmer BJ, et al. <i>Med Sci Sports Exerc.</i> 2010; 42(12):2282-2303
AHA/ACC	CVD Risk Reduction	2013 AHA/ACC guideline on lifestyle management to reduce cardiovascular risk	Eckel RH, Jakicic JM, Ard JD, et al. <i>Circulation.</i> 2014; 129(25 Suppl 2):S76-S99

## 9 Broad Questions for Evidence Review

What are we Treating? Nadolsky, Garvey

- Q1. Do the 3 phases of chronic disease prevention and treatment—ie, primary, secondary, and tertiary—apply to the disease of obesity?
- Q2. How should the degree of adiposity be measured in the clinical setting?
- Q3. What are the weight-related complications that are either caused or exacerbated by excess adiposity?
- Q4. Does BMI or other measures of adiposity convey full information regarding the impact of excess body weight on the patient's health?

Why are we Treating it? Jastreboff

- Q5. Do patients with excess adiposity and related complications benefit more from weight loss than patients without complications, and, if so, how much weight loss would be required?

How do we Treat it? Hurley, Mechanick

- Q6. Is lifestyle/behavioral therapy effective to treat overweight and obesity, and what components of lifestyle therapy are associated with efficacy?
- Q7. Is pharmacotherapy effective to treat overweight and obesity?
- Q8. Are there hierarchies of drug preferences in patients with the following disorders or characteristics?
- Q9. Is bariatric surgery effective to treat obesity?

## Obesity and 3 Phases of Chronic Disease Prevention and Treatment

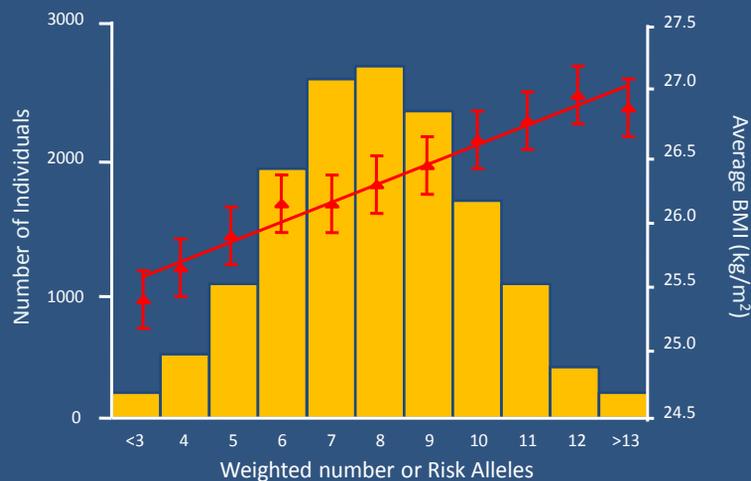
- **Q1. Do the 3 phases of chronic disease prevention and treatment—ie, primary, secondary, and tertiary— apply to the disease of obesity?**

## Three Phases of Prevention for Chronic Diseases

Phase of Intervention	Goals	Methods
<b>Primary Prevention</b> Primordial: Population Primary: High risk individuals	Prevent a disease from occurring in the first place.	Eliminate risk factors, remove causes, or increase resistance to disease.
<b>Secondary Prevention</b>	Halt the early progression of disease to prevent complications or sequelae. ∴ Before Complications	Involves a screening test and follow-up diagnosis, followed by treatment that prevents the disease from becoming more severe.
<b>Tertiary Prevention</b>	Reduce complications and prevent further deterioration. ∴ After Complications	Treatment strategies that limit adverse consequences of a disease on health.

Fletcher RH, *Clinical epidemiology : the essentials*. 5th ed. Wolters Kluwer/Lippincott Williams & Wilkins. Philadelphia. Chapter 10, 2014

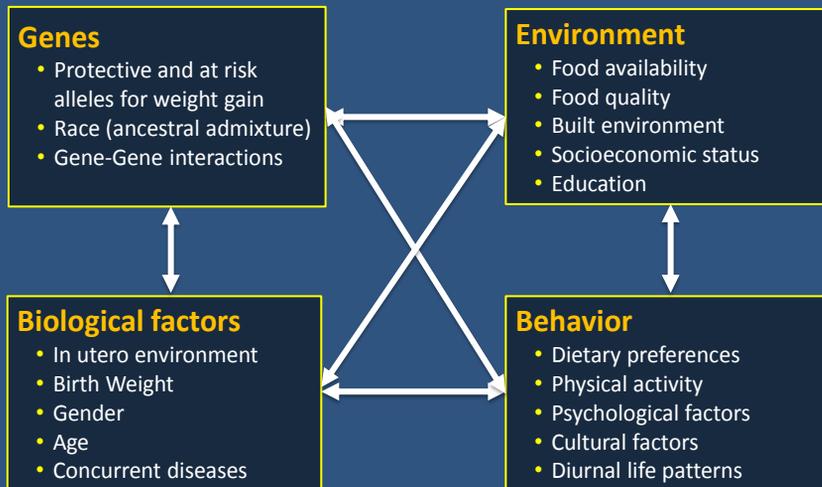
## BMI Increases as the Number of Susceptibility Alleles Increases



Willer CJ et al. *Nat Genet*. 2009;41:25-34.

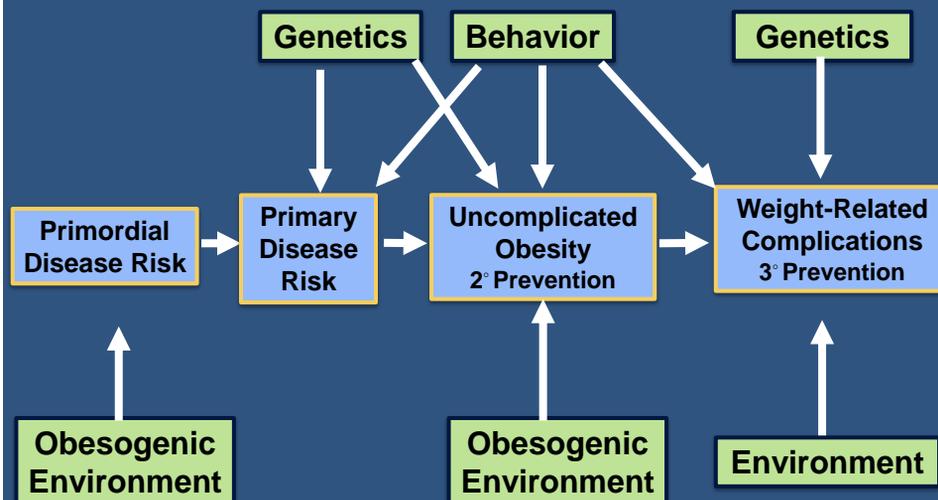
For Internal Medical Training Purposes Only  
 – Not for Distribution

## Determinants of Body Weight



## Chronic Disease Model - Obesity

(similar to diabetes, asthma, alcoholism, etc.)



## Criteria for Inclusion of a Disease in the 3-Phase Preventative Model

1. The medical condition must exact a substantial burden of human suffering.
2. There must be an effective screening test for the disease in terms of sensitivity, specificity, safety, acceptability, and cost.
3. Preventive interventions or treatments must exist at all three phases with acceptable effectiveness, safety, and cost.
  - Once the condition is found at screening, early treatment for secondary prevention should be advantageous when compared with later treatment after the patient becomes symptomatic or develops complications.
  - There must exist tertiary interventions that can stabilize the disease and ameliorate complications.

Fletcher RH, Fletcher SW, Fletcher GS. *Clinical Epidemiology: the Essentials*. Chapter 10 – Prevention. Fifth Edition. Lippincott Williams & Wilkins, Baltimore, 2014

### Phases of Prevention in Chronic Disease: Application to Obesity

Phase of Intervention	CHRONIC DISEASE IN GENERAL	OBESITY-SPECIFIC	
	Goals	Goals	Methods
<b>Primordial Prevention</b>	Prevent a disease from occurring in the first place.	Decreased incidence of overweight/obesity in populations	<ul style="list-style-type: none"> <li>• Public education</li> <li>• Built environment</li> <li>• Access to healthy foods</li> </ul>
<b>Primary Prevention</b>		Prevent overweight and obesity in high risk individuals	<ul style="list-style-type: none"> <li>• Annual BMI screening</li> <li>• Healthy meal plan</li> <li>• Increased physical activity</li> </ul>
<b>Secondary Prevention</b>	Halt the early progression of disease to prevent complications or sequelae.	Prevent progressive weight gain and the development of weight related complications	<ul style="list-style-type: none"> <li>• Diagnosis using BMI and evaluation for complications;</li> <li>• Treatment with lifestyle/behavioral therapy ± weight loss medications.</li> </ul>
<b>Tertiary Prevention</b>	Reduce complications and prevent further deterioration.	Eliminate or ameliorate weight-related complications and prevent disease progression.	<ul style="list-style-type: none"> <li>• Treatment with lifestyle/behavioral therapy plus weight loss medications;</li> <li>• Consider bariatric surgery.</li> </ul>

## Obesity and 3 Phases of Chronic Disease Prevention and Treatment

- **Q1. Do the 3 phases of chronic disease prevention and treatment—ie, primary, secondary, and tertiary— apply to the disease of obesity?**
- **R2. The modality and intensity of obesity interventions should be based on the primary, secondary, and tertiary phases of disease prevention; this 3-phase paradigm for chronic disease aligns with the pathophysiology and natural history of obesity and provides a rational framework for appropriate treatment at each phase of prevention (Grade C; BEL 4, upgraded due to high relevance to natural history of the disease).**

## AACE Consensus Conference on Obesity

Washington DC, March 2014

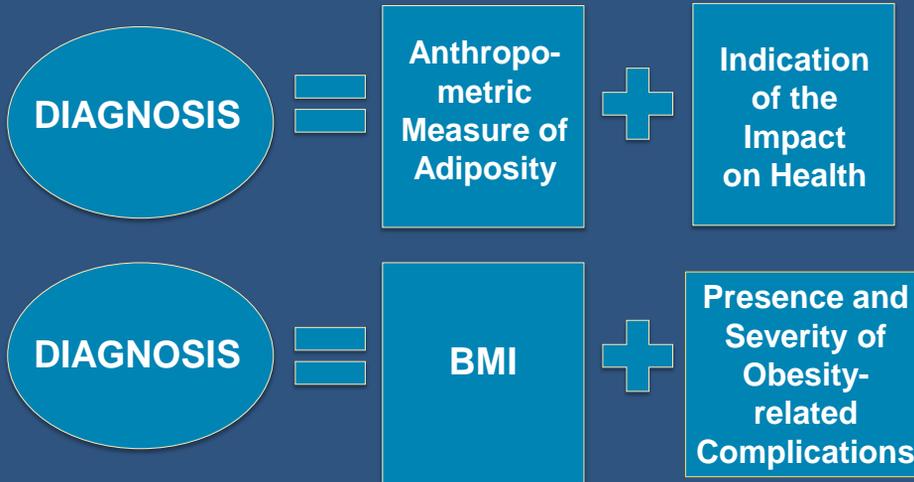
### Emergent Concept 1.

“The imprecision and uncertainties regarding the current diagnosis of obesity based solely on BMI, and the need for a diagnosis that was more medically meaningful and actionable, clearly emerged as major impediments to concerted action, and were responsible for a degree of immobilization across pillars.

“...the framework for a medical definition of obesity would consist of the continued use of BMI together with....an assessment of the presence and severity of obesity-related complications.”

Garvey et al. AACE White Paper: The AACE/ACE Consensus Conference on Obesity. Endocrine Practice, 20:956, 2014

## AACE Consensus Conference on Obesity: Diagnosis Must Integrate 2 Components



Garvey WT, et al. *Endocr Pract.* 2014;20:977-989.

## Advanced Framework for a New Diagnosis of Obesity as a Chronic Disease

DIAGNOSIS	ANTHROPO-METRIC COMPONENT	CLINICAL COMPONENT	Prevention/Treatment
Normal	BMI < 25		Primary
Overweight	BMI 25-29.9	No obesity-related complications	Secondary
Obesity	BMI ≥ 30	No obesity-related complications	
Obesity Stage 1	BMI ≥ 25	Presence of 1 or more mild-to-moderate obesity-related complications	Tertiary
Obesity Stage 2	BMI ≥ 25	Presence of 1 or more severe obesity-related complications	

Garvey WT, et al. *Endocr Pract.* 2014;20:977-989.

**POST-HOC Question: Use Inductive Interrogation to identify the Core Recommendations of the Clinical Practice Guidelines**

**By inductive evaluation of all evidence-based recommendations, what are the core recommendations for medical care of patients with obesity?**

- **R1.A.** The principal outcome and therapeutic target in the treatment of obesity should be to improve the health of the patient by preventing or treating weight-related complications using weight loss, not the loss of body weight *per se* (**Grade D**).
- **R1.B.** The evaluation of patients for risk and existing burden of weight-related complications is a critical component of care and should be considered in clinical decisions and the therapeutic plan for weight-loss therapy (**Grade D**).

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**THANK YOU**