TRANSCULTURALIZATION RECOMMENDATIONS FOR DEVELOPING LATIN AMERICAN CLINICAL PRACTICE ALGORITHMS IN ENDOCRINOLOGY—PROCEEDINGS OF THE 2015 PAN-AMERICAN WORKSHOP BY THE AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS AND AMERICAN COLLEGE OF ENDOCRINOLOGY

Jeffrey I. Mechanick, MD, FACP, FACE, FACN, ECNU, Chair1; R. Mack Harrell, MD, FACP, FACE, FACN, ECNU2; Myriam Z. Allende-Vigo, MD, MBA, FACP, FACE3; Carlos Aalvaguro, MD4; Onix Arita-Melzer MD5; Pablo Aschner, MD, MSc6; Pauline M. Camacho, MD, FACE7; Rogelio Zacarias Castillo, MD8; Sonia Cerdas, MD9; Walmir F. Coutinho, MD, PhD10; Jaime A. Davidson, MD, FACP, MACE11; Jeffrey R. Garber, MD, FACP, FACE12; W. Timothy Garvey, MD, FACE13; Fernando Javier Lavalle González, MD14; Denis O. Granados, MD15; Osama Hamdy, MBChb, PhD16; Yehuda Handelsman, MD, FACP, FACE, FNLA17; Manuel Francisco Jiménez-Navarrete, MD18; Mark A. Lupo, MD, FACE, ECNU19; Enrique J. Mendoza, MD, MSc, FACP20; José G. Jiménez-Montero, MD, FACE21; Farhad Zangeneh, MD, FACP, FACE22

From the 1Clinical Professor of Medicine Director, Metabolic Support Division of Endocrinology, Diabetes, and Bone Disease Ichan School of Medicine at Mount Sinai, New York, NY; 2Co-Director Memorial Center for Integrative Endocrine Surgery Hollywood, FL; 3Professor of Medicine University of Puerto Rico School of Medicine, Director Endocrinology Section University Hospital San Juan Puerto Rico, President AACE Puerto Rico Chapter, San Juan, Puerto Rico; 4Medical Director, Instituto Salvadorero del Corazón, Unidad Diagnóstica de Osteoporosis, San Salvador, El Salvador; 5Internal Medicine and Endocrinology, Education Program Director in Diabetes and Risk Factors, Thyroid and Diabetes Clinical Management Director, Hospital Benidorm, Honduras, CA; 6Scientific Director, Colombian Diabetes Association, Professor Endocrinology and Clinical Epidemiology, Javeriana University and San Ignacio University Hospital, Bogotá, Colombia; 7Professor of Medicine, Loyola University Medical Center, Director, Loyola University Osteoporosis and Metabolic Bone Disease Center, Maywood, IL; 8Clinical Professor of Internal Medicine Division of Internal Medicine, Hospital General “Dr. Manuel Gea González” México City, Mexico; 9Division of Endocrinology, Hospital Cima Director of San Agustin Research Center San José, Costa Rica; 10Catholic University of Rio de Janeiro, State Institute of Diabetes and Endocrinology, 11Clinical Professor of Medicine, Touchstone Diabetes Center, The University of Texas Southwestern Medical Center Dallas, TX; 12Endocrine Division, Harvard Vanguard Medical Associates, Division of Endocrinology, Beth Israel Deaconess Medical Center Boston, MA; 13Department of Nutrition Sciences and the UAB Diabetes Research Center, University of Alabama at Birmingham, and The Birmingham Veterans Affairs Medical Center Birmingham, AL; 14Professor, Faculty of Medicine, UANL: Nutrition, Endocrinology, Internal Medicine, Education Coordinator Endocrinology Service, Hospital Universitario, UANL, Head of the Diabetes Clinic of the Hospital Universitario “Dr. José E. González” UANL, Regional Hospital endocrinologist ISSSTE Monterrey, Policy Coordinating Group for Treatment of Diabetes in the Official Mexican Stane Program Coordinator for Healthy Eating and Physical Activity Monterrey, Nuevo Leon, Mexico; 15Internal Medicine and Endocrinology Hospital Alemán Nicaragua University Metropolitan Vivian Pellas, Professor Endocrinology and Internal Medicine Universidad Nacional Autónoma de Nicaragua Managua, Nicaragua; 16Medical Director, Obesity Clinical Program, Director of Inpatient Diabetes Program, Joslin Diabetes Center, Harvard Medical School Boston, MA; 17Medical Director & Principal Investigator, Metabolic Institute of America Tarzana, CA; 18President Costa Rican Association of Endocrinologists (ANPEDEM), Professor Endocrinology and Internal Medicine, University of Costa Rica Coordinator Endocrinology Department, Hospital San Vicente de Paul, Costa Rica; 19Medical Director, Thyroid & Endocrine Center of Florida Assistant Clinical Professor, Florida State University College of Medicine Sarasota, FL; 20Full Professor of Biochemistry and Nutrition. Dean School of Medicine, University of Panama, Panama; 21Professor of Medicine, Dean Post Graduate Studies, Universidad de Ciencias Medicas Head of the Division of Endocrinology Hospital CIMA, Escuad, San Jose, Costa Rica; 22Consultant in Endocrinology Medical Director, Endocrine, Diabetes & Osteoporosis Clinic (EDOC) Sterling, VA.

Address correspondence to American Association of Clinical Endocrinologists, 245 Riverside Avenue, Suite 200, Jacksonville, FL 32202.

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ABSTRACT

The American Association of Clinical Endocrinologists (AACE) and American College of Endocrinology (ACE) convened their first Workshop for recommendations to optimize Clinical Practice Algorithm (CPA) development for Latin America (LA) in diabetes (focusing on glycemic control), obesity (focusing on weight loss), thyroid (focusing on thyroid nodule diagnostics), and bone (focusing on postmenopausal osteoporosis) on February 28, 2015, in San Jose, Costa Rica. A standardized methodology is presented incorporating various transculturalization factors: resource availability (including imaging equipment and approved pharmaceuticals), health care professional and patient preferences, lifestyle variables, socio-economic parameters, web-based global accessibility, electronic implementation, and need for validation protocols. A standardized CPA template with node-specific recommendations to assist the local transculturalization process is provided. Participants unanimously agreed on the following five overarching principles for LA: (1) there is only one level of optimal endocrine care, (2) hemoglobin A1C should be utilized at every level of diabetes care, (3) nutrition education and increased pharmaceutical options are necessary to optimize the obesity care model, (4) quality neck ultrasound must be part of an optimal thyroid nodule care model, and (5) more scientific evidence is needed on osteoporosis prevalence and cost to justify intervention by governmental health care authorities. This 2015 AACE/ACE Workshop marks the beginning of a structured activity that assists local experts in creating culturally sensitive, evidence-based, and easy-to-implement tools for optimizing endocrine care on a global scale. (Endocr Pract. 2016;22:476-501)

Abbreviations:
A1C = glycated hemoglobin; AACE = American Association of Clinical Endocrinologists; ACE = American College of Endocrinology; BG = blood glucose; BMI = body mass index; CPA = Clinical Practice Algorithm; CPG = Clinical Practice Guideline; CVD = cardiovascular disease; DXA = dual X-ray absorptiometry; EDC = endocrine-disrupting compound; FBG = fasting blood glucose; FNA = fine-needle aspiration; HCP = health care professional; LA = Latin America; PAACE = Pan-American AACE; SU = sulfonylurea; T2D = type 2 diabetes; tDNA = transcultural Diabetes Nutrition Algorithm; TSH = thyroid-stimulating hormone; WC = waist circumference; WHO = World Health Organization

INTRODUCTION

Evidence-based medicine has generated many philosophical and pragmatic challenges to clinical care (1,2). Chief among these challenges is how to deliver culturally appropriate individualized endocrine care while adhering with evidence-based guidelines and algorithms developed for large heterogeneous populations. Management strategies must therefore be adapted for individual patients within single regions harboring different cultures (e.g., Mexican-Americans and Asian-Americans in California), individual patients in different regions harboring a common culture (e.g., Latinos in Mexico and Latinos in the Dominican Republic), or individual patients in different regions harboring many cultures (e.g., Asian Indians in India who are Muslim, Hindu, Jain, or Sikh; urban or rural residents in Mexico; or immigrant workers versus Emirati citizens in the United Arab Emirates). Unfortunately, this challenge has been largely ignored in clinical medicine, particularly with respect to white papers (an authoritative report by [a] specific organization[s] on a complex topic) that are preferred for wide acceptance and anticipated implementation. This white paper specifically addresses this challenge with specific application to Latin America (LA).

To date, white papers in clinical medicine have not produced the high impact on quality of care that was expected, even with formal implementation, validation efforts, and the noblest of intentions. Potential reasons for this failure range from burdensome time commitments for health care professionals (HCPs) to lack of validation for different target populations. Another key factor in adapting evidence to the individualized patient is context recognition—a critical part of patient-centered decision-making (3,4). More specifically, virtually all white papers lack depth and relevance in the way they relate to a multitude of different cultures, both within and outside a target region. Indeed, virtually any urban area in the U.S. contains a medley of cultures that constitute a significant portion of any local American medical practice.

Many experts and organizations define “culture” in different ways, but a common thread is the clustering of primarily nonphysical attributes distinguishing categories of people (Table 1) (5-14). The clustering of only physical or genetic attributes common to a category of people is more characteristic of “race,” whereas clustering that incorporates not only culture and race, but also an emphasis on genealogy, ancestry, geography (region), linguistics, and political ideology is characteristic of “ethnicity.” There are obviously overlaps among culture, race, and ethnicity, so for the purpose of clarity, culture will be referred to in this document as the main classifier that distinguishes different people around the world. Once culture is understood, there are other related terms that should be defined. Transculturalization describes the process of adapting concepts from one culture to another, without changing either culture. This is different than acculturation (changes in culture that occur when two or more cultures interact), deculturation (losing a previous culture), neoculturation (creating a new culture), and transsculturation (creation of a new culture when two or more cultures merge). Thus,
the process of transculturalizing an evidence-based white paper entails adaptation of rationale and generalized recommendations by accounting for cultural differences between a document’s original source and the target region, as well as differences among various cultures within the target region. Additionally, the transculturalization process does not pass judgment on a society’s culture or customs—namely, there is no “right” or “wrong” since there is no universal standard of morality (this concept is referred to as “cultural relativism”) (15).

Cultural factors that affect health care include, among others, gender roles, language barriers, personal space orientations, attitudes toward food, nutrition, and physical activity, exposures to toxins and endocrine disruptors, and socio-economics. For example, poverty—a socio-economic descriptor—is associated with fatalism, need for governmental aid, drug and alcohol abuse, dysfunctional family life, low self-esteem, and community disengagement. This can translate into increased risk for disease, more disease complications, longer recovery times, impaired postillness function, and decreased access to health care. Thus, culture here will query the multitudinous layers of ethnic and regional factors in the context of optimizing health care delivery, and more specifically, endocrine health. Even though the effect of cultural factors is relatively easy to understand with respect to lifestyle modification, the consideration of region-specific political and regulatory factors is much more complex and carries profound implications with respect to technology deployment, pharmaceutical development, and health care accessibility.

Latin culture is found in many of the Spanish-speaking nations and has been adopted by many different ethnic groups (Table 2) (16). The term “Latino” refers to those of Latin American origin or ancestry, including Brazilians. LA generally refers to South and Central America, as well as Mexico, where the dominant language is Spanish or Portuguese. Parenthetically, in some Central American countries, such as Guatemala, a number of aboriginal tongues are spoken, and in the Caribbean, African sub-cultural and ethnic ancestries predominate, collectively increasing population diversity. The term “Hispanic” is an official U.S. census category and refers to those from Spain and Spanish-speaking LA, but excludes Brazilians. The term Hispanic therefore describes a culture, independent of race, and a population smaller than Latinos (since the population of Spain is smaller than the population of Brazil). However, from a practical standpoint in the U.S., colloquial use of both Latino and Hispanic terms refer to the same population.

The Latin culture is influenced by pre-Colombian, European colonial, and later immigrant African and Asian cultures. Primary components of the Latin culture include the Spanish and Portuguese languages, Christian religion, elements of the Constructivist Movement and Muralism in

<table>
<thead>
<tr>
<th>Table 1 Definitions of Culture*</th>
<th>Source</th>
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</thead>
<tbody>
<tr>
<td>Symbolic, ideational, and intangible aspects of human societies</td>
<td>Banks et al (5)</td>
</tr>
<tr>
<td>Shared patterns of behaviors and interactions, cognitive constructs, and affective understanding learned through socialization</td>
<td>Center for Advanced Research on Language Acquisition (6)</td>
</tr>
<tr>
<td>Learned and shared human patterns or models for living – a primary adaptive mechanism</td>
<td>Damen et al (7)</td>
</tr>
<tr>
<td>Collective programming of the mind, which distinguishes members of one category of people from another</td>
<td>Hofstede (8)</td>
</tr>
<tr>
<td>Historically created designs for living, explicit and implicit, rational, irrational, and nonrational</td>
<td>Kluckholm et al (9)</td>
</tr>
<tr>
<td>Patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievements of human groups</td>
<td>Kroeber et al (10)</td>
</tr>
<tr>
<td>Shared knowledge and schemes created by a set of people for perceiving, interpreting, expressing, and responding to the social realities around them</td>
<td>Lederach et al (11)</td>
</tr>
<tr>
<td>Configuration of learned behaviors and results of behavior whose component elements are shared and transmitted by a particular society</td>
<td>Linton et al (12)</td>
</tr>
<tr>
<td>Patterns relative to behavior and the products of human action, which may be inherited … independent of the biological genes</td>
<td>Parson et al (13)</td>
</tr>
<tr>
<td>Learned and shared behavior of a community of interacting human beings</td>
<td>Useem et al (14)</td>
</tr>
</tbody>
</table>

*Culture therefore incorporates socio-economic, knowledge and practice patterns, and politics.
art, various literary movements, positivism, diverse musical genres, experimental cinematography, traditional and highly energetic dance styles, theater with historical context, and a cuisine with typical foods (Table 3). Overall, the diversity of the LA population imposes a challenge for the development of a generalized approach to prevent and treat chronic conditions, such as obesity and type 2 diabetes (T2D). This concern has been successfully addressed by integrating education, group support, and case management for Hispanics with T2D (17,18), with notable success when implemented in the workplace (19).

Biological drivers are not descriptors of culture per se. However, there are several pathophysiologic mechanisms that link certain cultures with higher risks for specific chronic diseases and therefore deserve consideration when transculturalizing clinical recommendations. For example, one of these mechanisms is based on the mitochondrial paradigm, championed by Wallace (20). In this paradigm, the rapid mutational rate of mitochondrial DNA allows energetics to quickly adapt to a changing environment. This is exemplified by ancestral human migration from Africa, through Europe and Asia, and subsequently into colder (Northern) climes crossing the Bering Strait land bridge into the Americas (20). The adaptive effect of colder climes on mitochondrial regulation of energetics may now be manifested by American aboriginal racial differences

<table>
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<tr>
<th>Country</th>
<th>Pop. (mill.)</th>
<th>LEB (years)</th>
<th>GNI ($U.S.)</th>
<th>Urban (%)</th>
<th>Illiteracy (%)</th>
<th>Ethnicity</th>
<th>Pop. (%)</th>
<th>%C</th>
<th>%N</th>
<th>%M</th>
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Abbreviations: B = Black; C = Caucasian; GNI = gross national income in U.S. dollars per inhabitant; LEB = life expectancy at birth; M = Mestizo (combined European and Amerindian descent); N = Native American; NA = not available; O = Other; Pop. = population.

Countries in bold type were represented at the PAACE Workshop in 2015. Population figures are from 2000 and are provided for context at time when other information was collected (16).
in glycemic status, adiposity and body composition, lipid metabolism, and consequent cardiovascular disease (CVD) risk (20). Thus, identification of mitochondrial haplotypes in specific cultures and subcultures (distinct groups within a culture) in LA could theoretically assist with disease risk assessment and targeted therapy (an example of “precision medicine”). Another underrecognized driver of chronic disease in LA, especially metabolic disorders such as T2D and obesity, are the genotoxic and molecular effects of endocrine-disrupting compounds (EDCs) (21) and pollutants (22,23), including artificial sweeteners, which can act through taste receptors in the intestine that modulate the microbiome, entero-insular axis, and appetite (24). Lastly, an allostatic load model of stress and physiologic dysregulation may be an attractive hypothesis for a metabolic disease driver in LA, though Gersten et al (25) analyzed cross-sectional survey data and were unable to identify statistically significant associations among life stressors and neuroendocrine biomarkers.

In 2010, the transcultural Diabetes Nutrition Algorithm (tDNA) program was initiated to address a specific need: to provide evidence-based and detailed nutritional information for the HCP caring for patients with T2D on a global scale, based on the premise that diverse cultures contributed to different disease expressions. This was in response to the growing global diabetes and obesity epidemics and a lack of accessible and/or implemented evidence-based nutritional information for T2D, particularly in the most heavily affected regions, such as LA, India, Southeast Asia, and the Persian Gulf. The Clinical Practice Algorithm (CPA; 26) format was favored in the tDNA program over other lengthy and text-heavy Clinical Practice Guideline (CPG) formats in order to improve the likelihood of acceptance and implementation in diverse cultural settings. Following a sequence of multiple tDNA summits with didactic lectures and small breakout sessions, convening key opinion leaders in LA, North America, Europe, the Persian Gulf, India, China, and Southeast Asia, a series of papers was published from 5 diverse regions (27-33), as well as a methods description (34) and a content validation (35).

To provide context for the imperative to globalize key medical recommendations, the following chronology is offered. In 2006, the General Assembly of the United Nations adopted resolution A/RES/61/225, which recognized diabetes as a chronic, debilitating, and costly disease and established World Diabetes Day (36). In 2011, the General Assembly of the United Nations adopted resolution A/RES/66/2, a political declaration bringing the global health problem on noncommunicable diseases, including diabetes and obesity, into sharp focus (37). The immediate ramifications of this latter declaration were calls for policy reform and scalability to address high-need areas, especially in lower socio-economic regions (38), as well as ethnic minorities in higher socio-economic regions (39). Most recently, in September 2015, the issue of noncommunicable diseases was included in the United Nations Sustainable Development Summit, further advancing a global commitment to diabetes care (40).

In 2014, the American Association of Clinical Endocrinologists (AACE) and American College of Endocrinology (ACE) began planning a Pan-American AACE (PAACE) Conference. A Workshop was appended to the PAACE conference in San Jose, Costa Rica, to identify transcultural attributes and challenges for local development of 4 LA CPAs consistent with existing AACE/ACE white papers (CPG, CPA, and other position papers and conference proceedings). In early 2015, AACE/ACE initiated efforts to promote the development, distribution, and validation of current and future transculturalizations of white papers on endocrine disease management. The goal of these activities is to assist experts and professional societies from both within and outside the U.S. to develop white papers that are culturally sensitive and applicable to the broad cultural array of patients found in their clinical practices.
This document represents the results of the 2015 AACE/ACE workshop in which culturally and regionally sensitive recommendations are provided for subsequent local LA CPA production. These recommendations incorporate nuance- and evidence-based suggestions for enhancement of patient care oriented to individual nodes in a CPA. Furthermore, these results provide content for education, hypothesis generation for research, and local LA CPA production in local markets.

**METHODS**

**Preworkshop Development**

A master template for CPA development suitable for the transculturalization process was developed prior to the workshop with the following attributes (Fig. 1):

1. Intuitive information process flow (status – decision – revised status – decision, etc.);
2. Relatively low number of decision node levels for simplicity (6 to 8 levels, containing one or more nodes each);
3. Explicit node-level numbering and associated tables to codify information for subsequent transculturalization guidelines; and
4. Tractable process wherein each node and table can be easily modified and adapted by an interactive group of experts.

Specific CPA topics were selected based on 4 prevalent endocrine management scenarios with a focus that was sufficiently broad to reflect disease prevalence but sufficiently narrow to improve the chance for success of this first attempt at transculturalization guidance:

**Topic 1: Diabetes domain:** using the glycemic control subalgorithm of the AACE/ACE Comprehensive Diabetes Management Algorithm – 2015 (41), and using the AACE/ACE CPG for developing a diabetes mellitus comprehensive care plan – 2015 (42);

**Topic 2: Obesity domain:** using weight-loss strategies in the AACE Comprehensive Diabetes Management Algorithm – 2015 and Complications-Centric Model for Care of the Overweight/Obese Patient (41);

![Master Clinical Practice Algorithm Transculturalization Template](image-url)

*“N” correspond to node levels; each node level will be codified as N1, N2, N3, …, N(n), where n is 6 to 8 but may be more if needed. Edges – the arrows between nodes – will remain unlabeled and for simplicity indicate process flow. Arrows are generally omitted when nodes are vertically aligned indicating downward process flow Screening: applies to a target population without specific risk factors. Aggressive case finding: applies to a population with specific risk factors. Descriptors are the target population attributes, such as risk factors. Stratify: to assign results of screening or aggressive case finding into bins (nodes) that correspond to status: yes (present), no (absent), or unknown (indeterminate). Diagnostics and further subset: to use evidence based diagnostic tools (labs, imaging, other) to diagnose the main disorder and others to further subset into a relevant pathophysiologic state (classifier) that maps to actual and different intervention strategies (e.g., primary versus secondary disease). Classifier: a diagnosis and subtyping of the diagnosis (e.g., primary or secondary osteoporosis, high-turnover or low-turnover osteoporosis, stage 0/1/2 obesity, etc.); also a response as “responder” or “nonresponder” used to justify the same (continuation) or different actions. Intervention: a specific lifestyle change, pharmaceutical or dietary supplement, procedure, or other; these are specific to the classifier, before and after an intervention. Specific goals of the therapy (identified before the intervention is implemented) can be incorporated in N4. Action: the practical version of that intervention – how it is done within a real-world setting – highly sensitive to transcultural factors. Metric: this is how the action’s effect is gauged – usually a lab test (e.g., blood glucose or glycated hemoglobin) but could also be an imaging result (e.g., improved bone mineral density on dual-energy X-ray absorptiometry) or clinical response (e.g., weight loss).
Topic 3: Thyroid domain: using the AACE thyroid nodule algorithm for electronic implementation (43); and
Topic 4: Bone domain: using the most recent postmenopausal osteoporosis clinical practice guideline (44).

AACE Scientific Committees provided updated scientific materials. Preliminary disease-specific CPA templates (Fig. 2 through 5) were developed in adherence with the master CPA template. The templates were then distributed to AACE/ACE workshop participants with instructions to provide their thoughts regarding transculturalizing each node and table for use among those patients residing in LA. Following receipt of these vetted algorithms from workshop participants, a preworkshop syllabus and PowerPoint presentation were created and distributed for on-site use during the AACE/ACE workshop. Iterative preworkshop revisions were performed based on participant feedback for each CPA domain until a general consensus was reached (modified Delphi method; 45).

2015 Workshop Proceedings

The purpose of the 2015 AACE/ACE workshop was to allow an opportunity for face-to-face discussion of culturally and regionally sensitive node-specific recommendations to assist local transculturalization efforts. The Workshop was conducted on Saturday, February 28, 2015, from 7 am to 1 pm at The Intercontinental Hotel in San Jose, Costa Rica. Following introductions of participants (Table 4), J.M. presented introductory material on transcultural endocrinology and then the CPA templates. Next, each of the specific endocrine disease management CPAs was presented: diabetes (Y.H.), obesity (J.M.), thyroid (R.M.H.), and bone (P.C.).

The Workshop participants reached consensus on 5 overarching principles during the CPA discussions.

1. There is only one level of optimal endocrine care for LA: the participants rejected the notion that there should be separate private and public levels of care for high and low socio-economic classes, respectively. Realistically, the one target level of care is viewed as “excellent,” but within the context of feasibility.

2. All patients with suspected prediabetes or diabetes should have a glycated hemoglobin (A1C) measurement as part of the initial evaluation and, if the diagnosis is confirmed, to have A1C measurements with follow-up: the participants recognized that there are problems with accessibility and affordability of a reliable A1C assay but agreed that this test was an absolutely necessary part of an optimal diabetes care plan.

<table>
<thead>
<tr>
<th>Name</th>
<th>Country</th>
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<tbody>
<tr>
<td>Jeffrey I. Mechanick, MD</td>
<td>USA (Chairperson)</td>
</tr>
<tr>
<td>Carlos Alvareco, MD</td>
<td>El Salvador</td>
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<tr>
<td>Onix Arita-Melzer, MD</td>
<td>Honduras</td>
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<tr>
<td>Pablo Aschner Montoya, MD</td>
<td>Colombia</td>
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<td>Myriam Z. Allende-Vigo, MD</td>
<td>USA</td>
</tr>
<tr>
<td>Ruth Báez, MD</td>
<td>Dominican Republic</td>
</tr>
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<td>Pauline M. Camacho, MD</td>
<td>USA</td>
</tr>
<tr>
<td>Sonia Cerdas Perez, MD</td>
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<tr>
<td>Manuel Cigarruista, MD</td>
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<td>Walmir F. Coutinho, MD</td>
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<td>Jaime A. Davidson, MD</td>
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<td>Felix Escano, MD</td>
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<td>Yehuda Handelsman, MD</td>
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<td>Jose G. Jimenez-Montero, MD</td>
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<td>Mark Lupo, MD</td>
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<td>Enrique Jorge Mendoza, MD</td>
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<td>Jorge Hector Mestman, MD</td>
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<td>Rogelio Zacarias Castillo, MD</td>
<td>Mexico</td>
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<tr>
<td>Farhad Zangeneh, MD</td>
<td>USA</td>
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</table>
3. Nutritional education and more pharmacologic options are necessary to optimize the obesity care model: the participants recognized that inertia in creating a successful comprehensive obesity care model was due to a conspicuous lack of effective nutritional education and pharmacologic options.

4. Optimal thyroid nodule evaluation and management must employ neck ultrasound: although the participants recognized the low availability of neck ultrasound in many LA regions, this technology, at a sufficiently high level of quality, was deemed necessary for early and accurate diagnosis and follow-up of thyroid nodule pathology.

5. More scientific data on bone loss in LA is needed to prompt governmental policy supporting the highest standard of osteoporosis care: the participants agreed that there is a paucity of evidence, particularly from LA, on bone loss, the use of dual X-ray absorptiometry (DXA), biochemical testing, lifestyle, and pharmacologic intervention, and in addition, that presentation of this evidence could lead to governmental actions to raise the level of osteoporosis screening and care.

The proceedings were translated (Spanish to English; English to Spanish) in real-time for all participants, and then translated transcripts were provided for document preparation. In addition, at the conclusion of the workshop, each participant provided his or her handwritten notes and feedback for translation and document preparation.

Postworkshop Development
Following the 2015 AACE/ACE workshop, all comments were reviewed and incorporated into a revised document with further writing and reviewing assignments sent to participant teams. A final document was produced after several iterations of review/revision by primary writers, expert reviewers, and the ACE Transcultural Endocrinology Task Force and then approvals by the AACE Executive Committee, AACE Board of Directors, and ACE Board of Trustees. This document will be initially published in English with the intent to translate into Spanish and is available free of charge through LA AACE chapters as well as by posting on the AACE website (www.aace.com). This plan is designed to maximize dissemination of information.

The objective for this effort is to provide recommendations for local experts to subsequently develop their own local, culturally and regionally sensitive, evidence-based CPAs, consistent with existing AACE/ACE white papers.

General Recommendations
AACE/ACE white papers, and CPAs in particular, must conform to the following rules, which are also recommended for the production of local LA CPAs:

1. Experts must have scientific credibility in the topic being addressed;
2. Disclosures of multiplicities of interest must be preliminarily obtained, with the intention of including experts without a true conflict of interest that could mitigate objective participation (as evaluated by the writing committee Chair and appropriate AACE/ACE committees);
3. There is no industry involvement with production, including but not limited to, funding, consulting, review, and commentary;
4. Full commitment of the writing committee to complete assignments on time and in conformity with the Chair’s instructions is essential;
5. Writing must be completed in a reasonable time (less than 6 to 12 months);
6. Information is constrained to a specific and relevant clinical question or problem;
7. Commitment to an evidence-based methodology is imperative, with
   a. Transparency;
   b. Middle-range literature searching (between overly generalized reviews and overly specific case reports);
   c. Incorporation of subjective factors;
   d. Incorporation of patient-oriented evidence that matters (“POEM;” i.e., clinically relevant, instead of exclusively disease-oriented evidence); and
   e. Recommendation cascades are the preferred outputs (providing alternatives for diagnostics and therapeutics);
8. A formal multi-level review process is used (writers, reviewers, committees, boards, etc.); and
9. CPAs are created with development of electronic implementation, performance metrics, and validation studies in mind (1,2,26).

Specific Node-Specific Recommendations
There are broad categories of LA transculturalization factors (31-33) that can be used in node-by-node analyses of Figures 2 through 5:

- anthropometrics;
- food sourcing and accessibility, culinary styles, and eating patterns;
- physical activity;
- tobacco and alcohol use;
- psychological stress and personal behavior;
- use of dietary supplements and nutraceuticals;
- exposure to EDCs and pollutants;
- local health care practices and attitudes;
- public advocacy programs;
- medical school curricula and clinical research methodologies;
- structure and financing of health care systems;
family and community engagement;
- accessibility to health care (with or without the use of technology);
- governmental policy and politics; and
- socio-economic factors.

General information is provided for each endocrine domain (Fig. 2 through 5). Core recommendations are provided for each endocrine domain and node level (N1, N2, N3, …, N6-8).

GLYCEMIC CONTROL IN T2D (FIG. 2)

General Information
AACE/ACE recently published their 2015 CPA (39) and 2015 CPG (42). These diabetes white papers emphasize a multifaceted, comprehensive care plan and complications-centric approach, rather than a linear or direct stepwise approach that simply targets surrogate markers, such as A1C, low-density-lipoprotein cholesterol, or body mass index (BMI).

Fig. 2. Diabetes Clinical Practice Algorithm Transculturalization Template.

The prevalence rates of diabetes and costs for diabetes care in countries in the World Health Organization (WHO) South and Central America (i.e., LA) region are provided in Table 5. The number of people with T2D globally is rapidly increasing, particularly among the young, as a result of a complex interaction of genetic and epigenetic systems, as well as environmental factors (46-48). Salient differences in scientific findings among nations, regions, ethnicities, and cultures relate not only to population characteristics but also to clinical study designs, including diagnostic tools and criteria (49,50). A relevant extension of this is the recalibration of global CVD risk assessment and predictor tools that incorporate more specific cultural factors (51). For instance, in Brazil, with the fourth largest number of people with diabetes in the world in 2013 (11.9 million cases), some risk factors have improved from 2006-2009 to 2010 (e.g., the number of smokers decreased from 16.2 to 11.3%; leisure time physical activity increased from 14.8 to 33.8%; and regular fruit and vegetable consumption increased from 20 to 23.6%), whereas others have worsened (e.g., overweight and obesity increased from 42.8 and
11.8% to 50.8 and 17.5%, respectively) (52). In Mexico, priorities for the future involve a major revamping of the health care system (53). In Costa Rica, however, where near universal health care coverage benefits 98% of the population, there is still a growing prevalence of diabetes (now 9.8%), with a need for improved primary prevention strategies (54,55). According to a recent study, the overall prevalence of T2D in the adult population in the San Juan metropolitan area of Puerto Rico was 15.2%, the overall prevalence of overweight (BMI 25.0 to 29.9 kg/m²) was 34.7%, and the overall prevalence of obesity (BMI ≥30 kg/m²) was 43.8% (56). Each of these figures is relatively high on the world stage and depicts a very troubling health care scenario for Puerto Rico.

Overall, in South and Central America, the average prevalence for diabetes is 8.0%, expected to reach 9.8% in 2035, with 24 to 50% of actual indigenous cases believed to be undiagnosed, whereas impaired glucose tolerance prevalence rates are expected to drop from 7.5 to 6.5% in the same time period (57). This concurrent increase in diabetes prevalence with a decrease in prediabetes prevalence is thought to be due to increased urbanization (a form of demographic transition) and an aging population (reflected by changes in the age pyramid) (57). Furthermore, important differences between relatively low prevalence rates in rural and relatively high prevalence rates in urban settings in the LA population underscore the need for an emphasis on lifestyle medicine (58). Interestingly, in the U.S., Concha et al. (59) found that Latinos with diabetes are more receptive to discussion about emotional health than Latinos without diabetes—a finding consistent with an allostatic load model of stress. Local experts in LA have published various glycemic management protocols (54,60,61) that can be helpful during the process of transculturalizing AACE/ACE white papers.

### Core Recommendations

**Figure 2 – Node level 1 (Screening or aggressive case finding)**

1. Provide the epidemiologic data that the LA population is at high risk for T2D; therefore, universal screening (to detect a common disorder without clinical manifestations for which there is a safe and cost-effective treatment) is not applicable and that patients should have aggressive case finding (to identify those most likely to have the disease, experience consequences, and benefit from treatment).

2. Verify numerical thresholds for T2D diagnoses after consideration of AACE/ACE guidelines and local (e.g., Asociación Latinoamericana de Diabetes [ALAD]; 61) guidelines (e.g., fasting blood glucose (FBG, post-challenge BG, casual BG, and A1C).

3. Address important controversies based on deviations between AACE/ACE and local guidelines, including: use of A1C to identify patients with prediabetes and at higher risk for T2D; use of a Finland Cardiovascular Risk Study (FINRISK) score (62) that also incorporates glycemia status and waist circumference.

4. Include a validated structured diabetes education program that focuses on glycemic control but also comprehensively monitors for complications.

5. Define the role of the primary care physician in aggressive case finding and initialization of management in a shared care model with health care professionals and the patient.

6. Discuss the economic impact of recommended tests on the target population.

**Figure 2 – Node level 2 (Stratify)**

1. A1C is recommended to guide treatment strategies.

### Table 5

<table>
<thead>
<tr>
<th>Country</th>
<th>2014 Prevalence (%)</th>
<th>2014 Cost/person (U.S. dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>5.97</td>
<td>1,422.73</td>
</tr>
<tr>
<td>Bolivia</td>
<td>6.30</td>
<td>252.08</td>
</tr>
<tr>
<td>Brazil</td>
<td>9.04</td>
<td>1,527.57</td>
</tr>
<tr>
<td>Chile</td>
<td>12.32</td>
<td>1,427.04</td>
</tr>
<tr>
<td>Colombia</td>
<td>7.17</td>
<td>805.03</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>9.27</td>
<td>1,364.45</td>
</tr>
<tr>
<td>Cuba</td>
<td>8.37</td>
<td>704.68</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>10.74</td>
<td>466.05</td>
</tr>
<tr>
<td>Ecuador</td>
<td>5.71</td>
<td>562.53</td>
</tr>
<tr>
<td>El Salvador</td>
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<td>377.29</td>
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<tr>
<td>Guatemala</td>
<td>8.93</td>
<td>385.38</td>
</tr>
<tr>
<td>Haiti</td>
<td>5.61</td>
<td>91.06</td>
</tr>
<tr>
<td>Honduras</td>
<td>9.53</td>
<td>319.71</td>
</tr>
<tr>
<td>Mexico</td>
<td>11.91</td>
<td>892.53</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>10.32</td>
<td>221.27</td>
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<td>Panama</td>
<td>8.36</td>
<td>1,096.20</td>
</tr>
<tr>
<td>Paraguay</td>
<td>6.2</td>
<td>658.24</td>
</tr>
<tr>
<td>Peru</td>
<td>6.1</td>
<td>523.53</td>
</tr>
<tr>
<td>Uruguay</td>
<td>6.58</td>
<td>1,742.08</td>
</tr>
<tr>
<td>Venezuela</td>
<td>6.58</td>
<td>935.45</td>
</tr>
</tbody>
</table>

*Countries in bold type were represented at the PAACE Workshop in 2015: http://www.idf.org/sites/default/files/Atlas-poster-2014_EN.pdf (accessed September 30, 2015) [46].*
2. Consider other A1C cutoffs (e.g., 7 to 8%) supported by local epidemiologic evidence that correlates with complication risk (61).
3. If unable to check A1C due to cost, availability, or reliability, management can be indexed to a BG metric (e.g., BG <140 mg/dL; 141 to 250 mg/dL; and >250 mg/dL) as long as supportive data can be provided.

Figure 2 – Node level 3 (Diagnostics and further subset classification)
1. Recognize that A1C is not an absolute criterion to start insulin and that the presence or absence of symptoms may be a better indicator to start insulin.
2. If an A1C is not available, then a very elevated BG (e.g., >250 mg/dL; fasting, postprandial, or random) and the presence of symptoms may be a suitable indicator to start insulin.
3. Consider a more specific process for individualization of risk stratification based on other lifestyle or biological factors associated with increased risk of diabetes-related complications.

Figure 2 – Node level 4 (Intervention)
1. Initiate lifestyle interventions for all patients: this may be provided by the primary care physician, diabetes educator alone or in group sessions, and/or the endocrinologist and should emphasize caloric reduction if overweight/obese, as well as behavioral medicine and emotional health.
2. Provide recommendations for culturally sensitive foods, meal planning, and healthy eating (Table 6).
3. Provide recommendations for culturally sensitive physical activity and sports.
4. Where appropriate, discuss and provide evidence for siesta breaks (short afternoon napping) in the framework of healthy sleep hygiene, healthy eating, and synchronization with diabetes medications.
5. Emphasize the use of diabetes educators.
6. Monotherapy is with metformin (unless contraindicated or poor tolerance anticipated); if not metformin, then incretin-based or sodium-glucose cotransporter 2 agents.
7. Do not recommend adding a sulfonylurea (SU) to metformin unless there are no other options available and/or cost issues, and if SUs are added, (1) educate regarding hypoglycemia, and (2) specify which SUs are recommended and the reasons.
8. Triple therapy is generally not recommended initially.
9. Insulinization is reserved for patients who are poorly controlled and symptomatic despite attempts to control with appropriate noninsulin therapies; however, insulinization may need to be introduced earlier if no other add-on therapy is available or affordable.
10. Consider elements of ALAD guidelines (61).
11. Include a listing of available medications and cost analysis for pharmacotherapy options.
12. Provide a detailed insulin management protocol using available insulin preparations and consistent with current guidelines (41,42).

Figure 2 – Node level 5 (Metric)
1. Specify LA A1C targets, and if they are different from the <6.5% (or at least <7%) range by 3 to 6 months, provide the reasons and evidence.
2. Specify weight loss targets if overweight/obese.
3. Specify any other targets relevant to glycemic control.

Figure 2 – Node level 6 (Follow-up intervention)
1. Continue to follow flow from monotherapy to dual therapy to triple therapy and insulin add-ons, as needed, depending on initial risk stratification, response to therapy, and whether the target is achieved. Acceleration of management should not be longer than every 3 months.
2. Provide individualized glycemic targets, interventions, and strategies incorporating comprehensive management plans.

WEIGHT LOSS IN OVERWEIGHT AND OBESITY (FIG. 3)

General Information
Overweight and obesity are risk factors and pathophysiologic drivers for the development of T2D and CVD. With global obesity prevalence rates failing to decline and actually worsening in certain groups, such as children, ethnic minorities, lower socio-economic classes, and more severely obese, among others, new paradigms of anti-obesity management must be considered. In 2012, AACE published a position paper on Obesity and Obesity Medicine calling for greater collaboration among stakeholders (63), authored and successfully advocated for the passage of the 2013 American Medical Association resolution 420 “Resolution of Obesity as a Disease” (64), organized a 2014 Consensus Conference on Obesity to build an evidence base (65), and produced a 2014 advanced framework for a new diagnosis of obesity based on a complications-centric chronic disease model (66). However, similar to the above AACE/ACE diabetes white papers, there were minimal culturally sensitive specific recommendations. This needs to be addressed, not only for Latinos in their native countries, but also for optimal management of the U.S. Latino population (67,68).
According to the WHO, as of January 2015, the global obesity prevalence rate has doubled since 1980, and most people live in areas of the world where mortality rates from overweight/obesity exceed those from undernutrition (69). The highest obesity prevalence rates are in Tonga, Nauru, and the Cook islands (>60%), with China and the U.S. harboring the greatest increased rates, followed by Brazil and Mexico (70). The greatest increase in obesity among women is in South and Central America (LA) and also Oceania (70). Moreover, in low- and middle-income countries, many of which are represented in LA, waist circumference (WC) has increased roughly 2 to 4 cm since the early 1990s at the same BMI (>25 kg/m²), suggesting even further increased cardiometabolic risk (71).

In a 2006 study, the prevalence of increased WC in Mexico ranged from 42.7 to 74.2% depending on the definition by ATPIII, AHA/NHLBI, or the International Diabetes Federation (72), with an overall prevalence of overweight/obesity based on a BMI ≥25 kg/m² of 71.2% (73). In another study from 2011, the WC cutoffs that correlate with visceral adipose tissue in LA are comparable to those for europids (European Caucasians; 94 cm for men; 90 to 92 cm for women) and effectively identify individuals with a strong genetic predisposition for insulin resistance (74). Pediatric overweight/obesity is also an identifiable driver for adult overweight/obesity in LA, with a prevalence rate of 18.9 to 36.9% in children age 5 to 11 years and 16.6 to 35.8% in adolescents age 12 to 19 years (75). A summary of obesity/overweight prevalence rates in Latin American countries is provided in Table 7 (76,77).

Among the set of WHO global targets to combat non-communicable diseases, the rise in diabetes and obesity must be halted (78). In fact, decreasing the obesity prevalence rate by as little as 1% in Brazil—where it is estimated

<table>
<thead>
<tr>
<th>Topic</th>
<th>Recommendation</th>
</tr>
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</table>
| General eating habits | Eat regular meals and snacks; avoid fasting to lose weight  
Consume plant-based diet (high in fiber, low calories/glycemic index, and high in phytochemicals/antioxidants)  
Understand Nutrition Facts Label information  
Incorporate beliefs and culture into discussions  
Use mild cooking techniques instead of high-heat cooking  
Use meal and/or snack replacements as needed  
Keep physician-patient discussions informal |
| Carbohydrate         | Explain the 3 types of carbohydrates—sugars, starch, and fiber—and the effects on health for each type  
Specify healthful carbohydrates (fresh fruits and vegetables, legumes, whole grains); target 7-10 servings per day  
Lower-glycemic index foods may facilitate glycemic control (glycemic index score <55 out of 100: multigrain bread, pumpernickel bread, whole oats, legumes, apple, lentils, chickpeas, mango, yams, brown rice), but there is insufficient evidence to support a formal recommendation to educate patients that sugars have either positive and negative health effects |
| Fat                 | Specify healthful fats (low mercury/contaminant-containing nuts, avocado, certain plant oils [e.g., olive oil], fish)  
Limit saturated fats (butter, fatty red meats, tropical plant oils [e.g., coconut and palm oils], fast foods) and trans fat; choose fat-free or low-fat dairy products |
| Protein             | Consume protein in foods with low saturated fats (fish, egg whites, beans); there is no need to avoid animal protein  
Avoid or limit processed meats |
| Micronutrients       | Routine supplementation is not necessary; a healthful eating meal plan can generally provide sufficient micronutrients  
Specifically, chromium; vanadium; magnesium; vitamins A, C, and E; and CoQ10 are not recommended for glycemic control  
Vitamin supplements should be recommended to patients at risk of insufficiency or deficiency |

* See reference 42.
that by 2050, 95% of males will be overweight or obese—will reduce the prevalence of CVD, stroke, hypertension, cancer, osteoarthritis, and/or T2D by 800 per 100,000 and reduce projected 2050 health care costs from $330 billion to $302 billion (79).

There are many dimensions to the obesity problem in LA other than clinical health, wellness, and disease prevention. Although there is considerable heterogeneity in lifestyle among the various LA regions and cultures, the impact of food insecurity (lack of access to sufficient food for an active healthy life; 80), double-burden of under- and overnutrition (81), and nutrition transition (changes in eating patterns [e.g., more refined high-calorie foods; less fresh fruits, vegetables, and grains]; 82) is significant. Moreover, the obesity problem not only affects the health of the LA population, it also increases the economic burden due to health care costs (83) and potentially compromises national security (84) due to diminished health and cardiometabolic risk in recruits.

In an effort to gain insight into the motivation for anti-obesity legislation to rein in these manifold problems, Gomez (85) performed a nested analysis and found that in the case of Brazil, there are different drivers for obesity at the national, urban, and rural levels that involve complex interactions among international, historical, and social factors. This made it difficult to draw meaningful conclusions when examining cross-national statistical evidence. This is consistent with an earlier conclusion reached by Trivedi et al (86), who explained the lack of direct correlation between state-by-state anti-obesity legislation in the U.S. and the concavity (or acceleration) of obesity prevalence growth rates as an insufficient effect on emergent and complex drivers, particularly those in the built environment (the human-made space: food availability and presentation, areas for physical activity, media and advertising, etc.).

Is the road to optimizing obesity care one that involves more anti-obesity legislation? The legal, social, and economic framework for this decision-making in Argentina and Brazil was recently reviewed by Arbex et al (87), once again supporting the hypothesis that cultural factors are part of the LA obesity problem. A potential tool to untangle the intricacies of obesity care in LA uses Census Tract data, as in the case for Rio de Janeiro city, Brazil, and a combinatorial spatial microsimulation model (88). Here, obesity ranged from 8 to 25% without socio-economic or gender differences at small local scales, with significant correlations with sugared-soda consumption (88). In Chile, where rapid societal changes have reduced undernutrition, an unintended consequence is overnutrition. As a result, an effective regulatory framework has been established to combat overweight/obesity in Chile through improved and iterative monitoring of lifestyle and appropriate actions, again in a local context (89).
Table 7
Age-Standardized Prevalence Rates of Obesity in Latin America by Gender and Country*

<table>
<thead>
<tr>
<th>2013 Prevalence rates (%)</th>
<th>Men</th>
<th>Women</th>
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<tbody>
<tr>
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<tr>
<td>Paraguay</td>
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<tr>
<td>20–29</td>
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<td>Argentina</td>
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<td>Cuba</td>
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* Countries in bold type were represented at the PAACE Workshop in 2015. Adapted from data presented in reference 77.

The role of government and national surveys to establish data-driven behavioral and specific food-based recommendations is also important. For example, a campaign that popularizes a healthy plate of LA foods would be highly effective. The plate would reflect a clinically effective and evidence-based healthy meal plan, similar to the plant-based Dietary Approaches to Stop Hypertension (DASH) diet, which is higher in fiber (fruits and greens), with adequate protein (lean meats and low-fat dairy) and relatively low starch (primarily found in staples: corn, plantain, beans, etc.).

Within the U.S., culturally sensitive interventions for obesity among the Latino population should address healthy eating, physical activity, behavior, environmental change, policy reformation, economic considerations, school- and community-based interventions, and the use of bilingual/bicultural HCPs (67,68).

Core Recommendations

Figure 3 – Node level 1 (Screening or aggressive case finding)

1. Use BMI and determine if other anthropometrics are appropriate (e.g., WC cutoffs based on local epidemiologic data) to identify patients with excess adiposity as either overweight or obese—a necessary step to initialize overweight/obesity weight-loss management programs.
Figure 3 – Node level 2 (Stratify)
1. Assign appropriate terminology in the native language for best communication with people with overweight/obesity (health care literacy and nutritional messaging).
2. Determine appropriate risk categories based on local correlative epidemiologic data.

Figure 3 – Node level 3 (Diagnoses and further subsets)
1. Evaluate patients with overweight/obesity for the presence and severity of weight-related complications, such as metabolic syndrome, prediabetes, T2D, hypertension, dyslipidemia, nonalcoholic fatty liver disease, sleep apnea, osteoarthritis, etc. (Table 8) (66). These and other weight-related complications, and their relative priorities, should be evaluated based on local evidence.
2. Include additional evidence-based anthropometric classifiers and their cutoffs, as needed (e.g., WC, waist-to-hip ratio, intra-abdominal fat by computed tomography, and body composition by DXA).
3. Include evidence-based and locally validated complications-centric composite scoring systems, such as the Edmonton Obesity Staging System (90) and the Cardiometabolic Disease Staging System (91).

Figure 3 – Node level 4 (Intervention)
1. All patients should be treated with lifestyle interventions.
2. Provide culturally sensitive foods and meal-planning recommendations that also accommodate individual preferences.
3. Provide culturally sensitive physical activity and sports recommendations that also accommodate individual preferences.
4. Discuss and provide evidence, where appropriate, on the beneficial and harmful effects of siesta breaks (short afternoon napping) on healthy sleep hygiene and healthy eating. Provide specific recommendations regarding siesta breaks to optimize lifestyle.
5. Organize interventions based on a preventive care model:
   a. primary—to decrease risk of disease;
   b. secondary—to prevent disease progression and the emergence of complications; and
   c. tertiary—to treat complications and minimize morbidity and mortality in late symptomatic disease.
6. Consider patients with more severe weight-related complications for more aggressive weight loss approaches that could include intensification of the lifestyle interventions, use of weight-loss medications, and/or bariatric surgery or other available and approved nonsurgical procedures.
7. Take inventory of available weight-loss medications and include safety and efficacy in local clinical trials (if any), cost, and cost-effectiveness (if possible).
8. Take inventory of available bariatric surgical and nonsurgical procedures and include safety and efficacy in local clinical trials (if any), cost, and cost-effectiveness (if possible).
9. Consider providing a listing of surgical centers with established excellence in bariatric procedures (surgical and nonsurgical).
10. Recommend more education for HCPs regarding lifestyle interventions, pharmacotherapy, and bariatric procedures (surgical and nonsurgical).
11. Address obesity medicine availability and affordability issues.
12. Recommend standards of excellence and training for procedural (surgical and nonsurgical) interventions for obesity that minimize adverse events and optimize clinical outcomes.
13. Specifically recommend expert pre- and postoperative nonsurgical management of patients undergoing bariatric surgery, consistent with the AACE/ACE CPG (92).
14. Consider specific therapeutic approaches to vitamin D undernutrition.
15. Engage government and policy-makers in effecting beneficial changes to the built environment, education, research, and ability for HCPs to provide optimal comprehensive obesity care.

Table 8
<table>
<thead>
<tr>
<th>Weight-Related Complications&lt;sup&gt;a&lt;/sup&gt;</th>
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<tr>
<td>Disability/immobility</td>
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<td>Gastro-esophageal reflux disease</td>
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<td>Hypertension</td>
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<td>Metabolic syndrome</td>
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<td>Nonalcoholic fatty liver disease</td>
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<td>Obstructive sleep apnea</td>
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<td>Osteoarthritis</td>
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<td>Polycystic ovary syndrome</td>
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<td>Psychological disorder and/or stigmatization</td>
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<td>Prediabetes</td>
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<td>Type 2 diabetes</td>
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<td>Urinary stress incontinence</td>
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<sup>a</sup>See reference 66.
Figure 3 – Node level 5 (Metrics)
1. Individualize and prioritize weight-loss goals based on targeted weight-related complications, specific patient attributes, patient/physician preferences, etc.

Figure 3 – Node level 6 (Follow-up intervention)
1. Following the period of weight loss, patients will need ongoing interaction with the HCP team and a plan designed to maintain the weight loss over the long term.
2. Give special attention to whether the weight loss has adequately improved weight-related complications.
3. If not, treatment should be initiated or intensified that specifically targets the weight-related complication.

THYROID NODULE DIAGNOSTICS (FIG. 4)

General Information

The nature of thyroidology in general, and thyroid nodule and cancer management in particular, is characterized by an evolving evidence base. Consequently, there are a wide variety of contingencies and choices in creating a probabilistic disease model. Thus, thyroid nodule management standards are particularly susceptible to local factors related to experience and preference, resource availability, and cultural variances. In fact, Yang et al (93) found that a lack of availability of management tools and treatments impaired consistent implementation of CPGs in Southeast Asia, with an inference this shortcoming is pervasive around the world. Huang et al (94) reviewed and analyzed 10 CPGs from different countries on the topic of thyroid nodules and thyroid cancer published prior to 2014 and confirmed this principle; namely, that there are distinct variations in clinical practice and a notable lack of standardization. However, the authors did not call for any attempts at transculturalization. The key recommendations of these guidelines are summarized in Table 9. Consensus CPAs for LA for thyroid nodule (95) and thyroid cancer (96) management were published in 2009 and serve as references for local recommendations based on the evidence available at that time.

The rationale for thyroid nodule evaluation is based on thyroid cancer incidence and mortality. Worldwide, the overall incidence of thyroid cancer is increasing, primarily due to increased detection and possibly better iodine nutrure. Thyroid cancer mortality may be decreasing, primarily due to improved management (97,98). However, there are differences in thyroid cancer death rates by region and gender in LA, particularly over the last few decades (Table 10). For instance, in Brazil, thyroid cancer mortality is increasing in elderly women (99), and in Cali, Colombia, there are subtle bimodal effects of socio-economic class on age-adjusted thyroid cancer incidence (100). In Costa Rica, the 2000-2009 National Register of tumors maintained by the Minister of Health reported an increase in

Fig. 4. Thyroid Clinical Practice Algorithm Transculturalization Template. CTN = calcitonin; TSH = thyroid-stimulating hormone.
the incidence and mortality of thyroid cancer, especially in women. Thyroid cancer is in fourth place in incidence after skin, breast, and cervical cancer, with a consistent increase during the last 3 years and an adjusted rate of 17.52 cases per 100,000 women (101).

In contrast, the U.S. SEER data show a relatively low thyroid cancer incidence rate of 12.9 cases per 100,000 for 2007-2011 (102). U.S. thyroid cancer mortality rates did not decrease (and actually increased to 8.09% for men and 6.76% for women from 2000-2010; 102), probably due to increasing detection rates and lack of significant progress in treating highly lethal forms of thyroid cancer.

A general lack of awareness of thyroid disease represents an obstacle to effective care. For example, in Mexico, autoimmune thyroiditis and hypothyroidism are prevalent, but awareness of these problems is relatively low (103). Optimizing care on a global scale, particularly in LA, requires a better understanding of the drivers for thyroid nodule and cancer development and formulation of culturally sensitive management strategies. More specifically, this requires realization of biological and environmental factors, as well as appropriate care delivery models that account for disparate technology availability (e.g., ultrasound machines, qualified cytologists, and possibly molecular technology).

There is inconsistency in the iodine sufficiency status for populations in LA. There appear to be higher rates of follicular thyroid cancer in populations with chronic iodine deficiency and higher rates of papillary thyroid cancer in iodine-sufficient populations (104). Iodine supplementation is beneficial to reduce the risk of goiter and more aggressive cancers, but there is still unconfirmed evidence that increased iodine intake drives a higher incidence of thyroid cancer (104).

A significant challenge to understanding thyroid cancer epidemiology is discussed by Brito et al (105), who estimated the incidence in Brazil using polynomial models and mortality figures. Interestingly, the authors concluded that differences on a local scale are related to availability of medical resources and the quality of data in cancer registries (105).

The evaluation of a patient with a thyroid nodule hinges on high-quality neck ultrasonography. Whether performed by the clinician evaluating the patient or by a radiologist, a complete description of the clinically relevant thyroid nodules, as well as any concerning lymph nodes in the anterior and lateral neck, is mandatory. The decision to observe or perform fine-needle aspiration (FNA) is based on clinical presentation and a comprehensive neck ultrasound. Radiologists need to be educated regarding the importance of a detailed description of thyroid nodules and neck lymph nodes in a risk-stratification paradigm. When endocrinologists and other nonradiologist clinicians (internists, surgeons, etc.) perform neck ultrasonography,
training and certification programs must be established to ensure quality. The cytologist interpreting the FNA should provide a detailed description of the findings as well as the Bethesda cytologic classification (106,107). The transculturalized LA algorithm should utilize patient historic data, physical examination findings, ultrasound findings, and cytologic findings (preferably using the Bethesda system), as well patient preferences, when determining which nodules to observe and which nodules to resect. Entry of patient demographics, risk factors, and thyroid nodule characteristics into widely utilized patient registries would be optimal.

Core Recommendations

**Figure 4 – Node level 1 (Screening or aggressive case finding)**

1. To specify how the algorithm is initiated: presence of risk factors, incidental discovery of a thyroid lesion, palpation of a thyroid nodule on routine examination, etc.

2. To review and modify the following list of specific high-risk descriptors based on epidemiologic data in LA: progressive local symptoms, affected first-degree relative, family member with medullary thyroid cancer, familial syndrome with papillary or follicular thyroid cancer, prior head/neck irradiation, growing/fixed/hard/irregular thyroid mass or large/immobile/hard cervical lymph node on exam, or an elevated calcitonin level.

3. To incorporate additional clinical scenarios and risk factors substantiated by relevant epidemiologic data.

**Figure 4 – Node level 2 (Stratify)**

1. Initial risk stratification status can be based on a composite risk score validated in the local LA region/culture (108).

2. Consider analyzing existing LA regional thyroid cancer registries to guide selection of appropriate risk scores and stratification protocols.
Figure 4 – Node level 3 (Diagnostics and further subset)

1. Review and incorporate published white papers for neck ultrasound methodologies and interpretations.
2. Incorporate the Thyroid Image Reporting and Data System (TIRADS) or other local classification systems for neck ultrasonography use (109).
3. Stipulate the need for high-quality neck ultrasound machines, and if not readily available, mechanisms must be described to access this essential resource, including finding off-site locations and providing logistics for purchase or lease.
4. Emphasize the need for expertise in performing diagnostic neck ultrasound, and if not available, to establish mechanisms for training, certification, and continuing education, such as the AACE Endocrine Certification in Neck Ultrasound (ECNU) program.
5. Provide detail for logistics and acquisition of supplies for high-quality neck ultrasonography.
6. Incorporate current and locally validated strategies for neck ultrasonography, and thyroid-stimulating hormone (TSH), and thyroid scintigraphy in the routine evaluation of thyroid nodules, coupled with aforementioned Node 2 risk factors, to establish an overall risk class to guide management.

Figure 4 – Node level 4 (Intervention)

1. Stipulate the need for expertise in performing ultrasound-guided FNA for the routine evaluation of higher-risk thyroid nodules, and if not available, to establish mechanisms for training, certification, and continuing education, such as the AACE ECNU program.
2. Provide pathways for logistics, education, and acquisition of supplies for high-quality ultrasound-guided FNA.
3. Recognize that the quality of ultrasound machine technology and user skill/experience in performing neck ultrasound for FNA guidance in Node 4 does not need to be as high as in Node 3 for neck diagnostics.
4. Create access to sensitive and accurate TSH assays, preferably an ultrasensitive, or third-generation, TSH assay.
5. Ensure availability of high-quality thyroid scintigraphy for clinical use when the TSH is low; this includes not only access to the technology but also access to well-trained endocrinologists, radiologists, or nuclear medicine specialists for interpretation.

Figure 4 – Node level 5 (Metric)

1. Focus on neck ultrasonography findings that are associated with higher risk (e.g., growing, irregular margins, microcalcifications, intranodular hypervascularity, associated with abnormal lymph nodes, etc.).
2. Employ the Bethesda classification system for cytology interpretation, with particular focus on protocols to further manage Bethesda III and IV (specifying if Hürthle cell [oncocytic] type) classifications, with or without availability of molecular markers.
3. Develop protocols for the use of molecular markers (for indeterminate cytologic results, such as Bethesda III and IV) based on currently published CPGs as well as any locally developed CPGs. If this technology is available, to provide as much detail as possible regarding logistics and performance, particularly if there are different tests available.

Figure 4 – Node level 6 (Follow-up intervention)

1. Provide protocols for observation, time intervals for re-evaluation, and need for surgery or other interventions, all supported by scientific substantiation.
2. Use registries to enhance uniform application of CPA-driven care.

POSTMENOPAUSAL OSTEOPOROSIS (FIG. 5)

General Information

Culturally sensitive influences on fracture risk among postmenopausal women on a global scale can be considered in 3 broad categories. The first relates to genetic and epigenetic system interactions, the second to lifestyle variables (eating patterns, physical activity, smoking, alcohol use, exposure to EDCs, etc.), and the third to health care accessibility, variances in practice standards, HCP experience, and availability of technology. Prevention of bone loss is a key to improving osteoporosis prevalence rates and the direct and indirect costs associated with this chronic disease.

The first population-based study of vertebral fractures in LA found an 11.18% prevalence rate of radiographically ascertained vertebral fractures in a random sample of 1,922 women aged 50 to 80 years from cities within 4 different countries (Argentina, Brazil, Colombia, Mexico) and in Puerto Rico (106). The prevalence of asymptomatic vertebral fractures steadily increased from age 50 to 59 years to over 80 years without regional variations. However, patient age and history of fractures were associated with vertebral fractures in this population (110). Sen et al (111) described a risk assessment tool for LA (Osteorisk), which incorporates age, weight, country, estrogen use, and history of fracture, with 91% sensitivity and 47% specificity.

The burden of disease, represented as disability-adjusted life years for osteoporotic fractures, is intermediate among various chronic diseases, with osteoporotic...
Fig. 5. Bone Clinical Practice Algorithm Transculturalization Template. *BMD* = bone mineral density; *DR* = distal 33% radius; *DXA* = dual-energy X-ray absorptiometry; *FN* = femoral neck; *LS* = lumbar spine; *LSC* = least significant change (least amount of BMD change that is statistically significant); *TH* = total hip.

1. FRAX scores (120).
2. Indicators of fracture risk: age, frailty, prior fractures, glucocorticoids, FRAX components, others (Table 1).
3. Includes intact parathyroid hormone, 25-hydroxyvitamin D, and 24-hour urinary calcium excretion. Markers of bone turnover (e.g., N-telopeptide, C-telopeptide, bone-specific alkaline phosphatase, and osteocalcin) are not included in current AACE CPG.
4. For example, kidney, liver, adrenal, thyroid, parathyroid, hematologic/oncologic diseases.
5. Oral antiresorptive agents – alendronate and risedronate; injectable antiresorptive agents – zoledronic acid and denosumab; alternative agents – ibandronate, raloxifene, and teriparatide.
6. See oral and injectable antiresorptive agents above; alternative agents – alendronate, risedronate, ibandronate, and raloxifene.
fracture rates ranging from only 0.8% in Africa to 34.8% in Europe (the rate is 15.7% in the Americas) (112). Costs of fragility fractures for all persons 40 years of age and over in Mexico exceeded $250 million in 2010, in the context of prevalence rates of 32.8% for osteopenia and 8% for osteoporosis (113). Overall expenditures related to bone loss were over $400 million in 2010 and are expected to rise by 19.2% in 2015 and 41.7% by 2020 (113). In Brazil, the prevalence of osteoporosis (determined by measuring bone mineral density) among clinical series of women over 40 years of age ranges from 25 to 33% (114). In another study, Morales-Torres et al (16) found that in the expanding elderly population of LA, 12 to 18% of women over 50 years of age have vertebral osteoporosis and 8 to 22% have proximal femur osteoporosis. Vertebral and femoral neck bone mineral densities decline comparably over the lifespan in women among 6 LA countries studied: Argentina, Mexico, Brazil, Colombia, Cuba, and Chile (16).

In a review by Prentice (115), with the exception of calcium and vitamin D, there is only weak to no evidence to support the inclusion or exclusion of specific dietary components for bone health. However, in a study comparing attitudes toward dietary supplements for osteoporosis, Mexican respondents reported taking their calcium but not their vitamin D (116). In fact, there is a linear association of calcium intake and hip fracture incidence for 15 different countries from around the world (115). Furthermore, various dietary factors have possible positive (vitamin D, calcium, fruits and vegetables, and moderate alcohol consumption), neutral (phosphate), negative (low body weight, high alcohol consumption, and sodium), and unclear (protein) associations with fracture risk (115). In a study by Copè et al (117) of postmenopausal women in Brazil, obesity was not associated with fracture.

In Brazil, expenditures for osteoporosis in 2008–2010 exceeded $288 million, with most resources directed toward women (118). Most of the osteoporosis-related procedures were outpatient, but most of the expenses were inpatient (118). There are no demonstrable associations of fracture risk among men and women in Brazil with social class, but among women, there is a higher incidence of fractures in metropolitan areas compared with rural areas (119).

Core Recommendations

**Figure 5 – Node level 1 (Screening or aggressive case finding)**

1. Emphasize that all postmenopausal women are at increased risk for bone loss and fragility fracture, and therefore, DXA serves as a tool for aggressive case finding in this setting and not for screening per se.
2. Provide accurate DXA T-scores for lumbar spine, total hip, femoral neck, and distal third of the forearm, where bone loss can occur.
3. Use region-specific, validated fracture risk assessment tool scores to quantify risk (120).

**Figure 5 – Node level 2 (Stratify)**

1. Emphasize that the main classifier is whether a patient has disease (osteoporosis) or not.
2. Define the osteoporosis state for the postmenopausal woman with a culturally specific context that helps with patient-physician communication and health literacy.

**Figure 5 – Node level 3 (Diagnostics and further subset)**

1. Clarify the meaning of osteopenia as a non–disease state that is associated with higher risk for disease (osteoporosis) and therefore requires some degree of intervention, ranging from lifestyle intervention alone (physical activity and nutritional recommendations) to pharmacotherapy in higher-risk categories.
2. Emphasize the relevance of prior fragility fractures in further risk assessment for future fractures and need for intervention.
3. Evaluate the validity of other factors associated with fracture risk within the context of a specific LA region or culture (see Table 11).
4. Provide an assessment for each biochemical test recommended based on cost, cost-effectiveness, performance, availability, and logistics for use.
5. Validate and standardize each test for the target LA population.
6. Provide context and evidence-based recommendations for the issue of vitamin D undernutrition, sunlight exposure, and use of sunscreens.
7. Screening for other secondary causes should be guided by region-specific prevalence rates and/or risk factors.
8. Currently, bone turnover markers are not used in AACE CPGs for stratification purposes or to direct specific interventions.

**Figure 5 – Node level 4 (Intervention)**

1. Recognize the different protocols for treating those with only moderate risk versus those with high risk.
2. Provide a pragmatic listing of available interventions with evidence for safety and efficacy, as well as costs and logistics.
3. Emphasize the role of culturally sensitive lifestyle interventions for all patients with any degree of bone loss, including low-impact, weight-bearing physical activity, nutritional (including increased fruits and vegetables), tobacco cessation, moderation of alcohol consumption, and prevention of falls.
4. Include a statement about medications associated with bone loss and the need for the HCP to discuss these issues with the patient.
5. Consider the transformative nature of these CPGs, especially where resources are limited or constrained.
6. Validate and standardize these tests for the target Latin American population.
7. Comment about the need for further research and data collection that is region- and culturally specific.

**Figure 5 – Node level 5 (Metric)**

1. Define responder classifications based on locally validated evidence, if available.
2. Specifically mention the threshold for magnitude of response needed as well as the time interval for interrogation to determine whether an adequate response has occurred.
3. Emphasize the message that osteoporosis is a chronic disease that will require management for a potentially long period of time, spanning years.

**CONCLUSION**

The 2015 AACE/ACE CPA node-specific analysis and portfolio of recommendations is designed to optimize endocrine care on a global scale by facilitating the local CPA transculturalization process. This methodology is tractable and designed for easy reproducibility by a wide range of professional medical organizations. Transculturalization is mandatory for the translation of scientifically substantiated clinical practice white papers into meaningful and successful implementation strategies on a global scale, as well as a regional/national scale wherein multiple cultures coexist. In other words, transculturalization offers the means to effectively address epidemiologic trends in health care, which have previously demonstrated recalcitrance to conventional white paper development and implementation strategies. Notwithstanding, this aspiration of enhanced relevance of transculturalized CPAs requires additional formalization.

One aspect of formalization is the creation of electronic products that, in contrast with printed narrative documents, are more accessible, easier to publish, and less costly to modify over time. Moreover, electronic versions are suitable not only for domestic use in modernized clinical practice settings but also accessible through a global Internet application. In this latter construct, the user would, in theory, be able to designate their location on a world map, input information about their region, culture, and personal medical status, and then query specific areas of interest, for example, a healthy eating pattern for a young adult male in Mexico who is overweight and has T2D. The output could consist of updated scientifically substantiated nutritional recommendations tailored for the particular query. All input and output information would lack personal identifiers to protect privacy, but depersonalized inputs could be collected in a registry. This would allow for further data mining, research, and discovery of emergent information and should enable well-designed validation protocols based on longitudinal data input. Financing this enhancement of the current transculturalization project and other derivative activities would be challenging, albeit solvable, and part of the enduring mission of AACE/ACE.

**DISCLOSURE**

Dr. Jeffrey Mechanick has received honoraria from Abbott Nutrition International for lectures and for the tDNA program development.

Dr. Pauline Camacho has received research grants from Amgen and Eli Lilly and has served on the advisory board for Amgen.

Dr. Walmir Coutinho has received honoraria from Abbott Diabetes Care, ACHE, AstraZeneca, Janssen, and Novo Nordisk.

<table>
<thead>
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<th>Table 11 Risk Factors for Fracture in Postmenopause*</th>
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<td>Increased age</td>
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<td>Alcohol &gt;3 drinks/day</td>
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<td>Body mass index</td>
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<td>Current tobacco smoking</td>
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<td>Femoral neck BMD</td>
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<td>Frailty</td>
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<td>Neuropathy, instability, and falls</td>
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<td>Parent with fractured hip</td>
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<td>Prior fracture</td>
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<tr>
<td>Rheumatoid arthritis</td>
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<tr>
<td>Other causes for secondary osteoporosis</td>
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Abbreviation: BMD = bone mineral density (determined using dual X-ray absorptiometry).

* See http://www.shef.ac.uk/FRAX/tool.jsp for World Health Organization Fracture Risk Assessment tool (FRAX) (120).
Dr. Pablo Aschner has served on advisory boards for AstraZeneca, Eli Lilly & Co, GlaxoSmithKline, Janssen, Merck, Novartis, Sanofi, and Sharpe & Dohme. He has also been on the speakers’ bureau for AstraZeneca, Boehringer Ingelheim, Eli Lilly & Co, Merck, Novartis, Sanofi, and Sharpe & Dohme.

Dr. W. Timothy Garvey has received consultant fees from Boehringer Ingelheim, Daiichi-Sankyo, Eisai, Janssen, Liposcience, Novo Nordisk, and Vivus, Inc. He was principal investigator for contracted research for Amylin, AstraZeneca, Eisai, Elcelyx, Lexicon, Merck, Novo Nordisk, Pfizer, Sanofi, and Weight Watchers and is a stockholder for Bristol-Myers Squibb, ISIS, Lilly, Merck, Novartis, and Pfizer.

Dr. Osama Hamdy has received research support from Metagenics, Inc and the USDA Dairy Council and has served on the advisory board for AstraZeneca and Novo Nordisk.

Dr. Yehuda Handelsman has received research grant support, been a consultant for, and received speaker honoraria from Amarin, Amgen, AstraZeneca, Bristol-Myers Squibb, Boehringer Ingelheim, Eisai, Essperion, Frifolis, GlaxoSmithKline, Hamni, Intarcia, Janssen, Lexicon, Eli Lilly & Co, Merck, Novo Nordisk, Pfizer, Regeneron, Sanofi, Takeda, and Vivus, Inc. He is also the Immediate Past President of the American College of Endocrinology.

The other authors have no multiplicity of interest to disclose.

REFERENCES


52. de Almeida-Pittito B, Dias ML, de Moraes AC, Ferreira SR, Franco DR, Eliaschewitz FG. Type 2 diabetes in Brazil: epidemiology and management. Diabetes Metab Syndr Obes. 2015;8:17-28.


84. Popkin BM. Is the obesity epidemic a national security issue around the globe? *Curr Opin Endocrinol Diabetes Obes.* 2011;18:328-331.


