ON THE CUTTING EDGE
Diabetes Care and Education

GETTING TO THE HEART OF DIABETES: FROM EVIDENCE TO GUIDELINES TO INDIVIDUALIZATION

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Message from the Theme Editor:
Mary Lou Perry, MS, RD, CDE

If we chose musical scores to describe this issue, they’d be “Show Me!” from Lerner and Lowes’ *My Fair Lady* and “We’re All in This Together” from Disney’s *High School Musical* Franchise. At no other time in the history of guideline writing has evidence been so central to the end product.

Moreover, at no other time have work groups and stakeholder organizations been more closely aligned than they are now. Gestated by the National Heart, Lung, and Blood Institute (NHLBI), with the American Heart Association (AHA) and American College of Cardiology (ACC) serving as steward organizations, cardiovascular disease guidelines were bundled together and launched in November 2013. The guidelines were published jointly in the *Journal of the American College of Cardiology* and *Circulation* and included four designated areas: atherosclerotic cardiovascular disease (ASCVD), risk calculator, lifestyle, and obesity.

This issue of *On the Cutting Edge* explores the controversies and confusion generated by the four guidelines as well as the long-awaited Joint National Committee (JNC) 8 for hypertension and the familiar American Diabetes Association nutrition guidelines. Why should registered dietitians (RDs) and registered dietitian nutritionists (RDNs) in diabetes-focused practice know about these guidelines? Because heart disease and stroke are the #1 cause of death and disability in those who have type 2 diabetes.

As the theme editor, I am especially proud of the collaborative partnerships with the Sports, Cardiovascular and Wellness Nutrition (SCAN) and Weight Management Dietetic Practice Groups related to this publication event. SCAN is reprinting the lifestyle guideline in their upcoming PULSE newsletter, and Diabetes Care and Education is reprinting the original obesity guideline summation manuscript from the summer issue of *Weight Management Matters*. This is further evidence that we are all in this together!

In the opening article of this issue, Janet DeJesus chronicles the six-decade mission of the NHLBI. First and foremost, the organization’s goal is to narrow the discovery-delivery gap in cardiovascular disease, with the ultimate goal of securing a healthy nation. DeJesus archives each of the NHLBI-generated reports and
ON THE CREATING EDGE
Diabetes Care and Education

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STRATEGIC PRIORITY AREAS

GOAL 1: Sustain and enhance participation and retention among members.
- Use electronic technology to engage new and existing members
- Promote and support member professional development
- Maintain a high value of membership

GOAL 2: Advance DCE’s member relationships among industry, media, professional and public education.
- Collaborate with organizations to promote RDs in diabetes care, education and prevention

GOAL 3: Support and promote public policy and research efforts in nutrition and diabetes
- Address and support public policy efforts involving nutrition and diabetes and prediabetes
- Increase research efforts

delineates events that fundamentally changed the Institute's role in guideline development. Going forward, the primary role is the generation of high-quality systematic reviews and partnering with stakeholder organizations for writing, dissemination, and implementation.

With the article title “Treat-to-risk Trumps Treat-to-target in New Cholesterol Guidelines,” Helen Marie Molnar, NP, aptly describes the pivotal changes in the ASCVD guidelines. Low-density lipoprotein cholesterol targets have been abandoned in favor of identifying specific groups of individuals who would benefit from moderate- or high-dose statins. Additionally, she addresses the controversial Pooled Cohort Risk Assessment tool, providing an update on new information validating the tool. Statin safety, statin-induced myalgia, and non-statin therapies round out the discussion.

Sharon Smalling, MPH, RD, LD, Shirley Chambers, MEd, RD, LD, CDE, and Christine Camarillo, RD, LD, describe how the NHLBI-appointed crosscutting Work Groups were charged with answering three critical questions and used those data to develop 10 lifestyle recommendations to reduce cardiovascular risk. RDs and RDNs will discover that these recommendations are supported by robust evidence that is stratified by varying degrees of strength. In addition, dietary recommendations are given for dietary patterns to lower blood pressure, LDL-C and cardiovascular disease (CVD) risk including trans fat, sodium and saturated fat.

In an article reprinted from the Weight Management Practice group, Noonas and Millen, who served as members of the writing panel for the obesity guidelines, add perspective and provide insight into the guideline development process, including history, background, and context. They detail how systematic reviews are completed, the impact of inclusion criteria if a study is considered, and how the included data ultimately define the recommendations. RDs and RDNs should gain an understanding of the complexity of the charge of writing guidelines. Unequivocally, the RD and RDN are considered the experts in treatment and evaluation of obesity.

Hunter Spencer, Kathaleen Briggs Early, PhD, RDN, CDE, and Joel Thome, PharmD, BACACP, acknowledge the controversy.

MISSION
Empowering DCE members to be leaders in nutrition and diabetes education, management and prevention.

VISION
Optimizing the quality of life for people with diabetes.
surrounding the release of JNC 8, eloquently outlining the three critical questions and providing background about the dissenting opinions of the original JNC panel members. They compare and contrast JNC 7/8 to the American Diabetes Association (ADA) hypertension recommendations, outline the relevant inclusion criteria, discuss the critical questions, describe the limitations and considerations of the report, and ultimately address the importance of clinical judgment when deciding therapies.

Joyce Green Pastors, MD, RD, CDE, provides a summary and explanation of the only non-AHA/ACC guideline paper: the 2013 ADA nutrition therapy recommendations. She not only highlights new aspects of the nutrition guidelines, but elucidates what points they share with the AHA/ACC lifestyle and obesity guidelines. She brings 30+ years of diabetes nutrition wisdom to the table, celebrates the RDs who served on the writing group, and concludes with a list of educational resources for the beginner or experienced clinician. Congruent with all the cardiovascular guideline papers as well as the 2013 ADA nutritional therapy recommendations is the overarching belief that guidelines inform treatment decisions; individualization and clinical judgment remain in hands of the patient and provider.

Finally, in a question-and-answer format, a cardiologist and an endocrinologist who work together in collaborative practice discuss how the AHA/ACC guidelines have affected their practice and treatment recommendations. All the questions you have wanted to ask now are answered by those who treat concomitant diabetes and cardiovascular disease.

The new guidelines should foster the patient-provider relationship and encourage discussion related to cardiovascular care. Although the guidelines are based on best available data and are living documents, additional research is needed and the generation of more information should be encouraged. Finally, the guidelines provide evidence that various organizations can work together to achieve the outcome of improving cardiovascular disease and the overall heart health of our patients.

To view the DCE officer directory, visit: http://www.dce.org/about-us/officers-leadership/officer-directory/
The National Heart, Lung, and Blood Institute (NHLBI) has provided leadership for the vigorous pursuit of excellence in the translation, dissemination, and utilization of research both nationally and internationally for more than 6 decades (1). The goal of the NHLBI is to accelerate the application of health research to strategies and programs for the prevention, detection, and treatment of cardiovascular, lung, and blood diseases and to narrow the discovery-delivery gap. Historically, the NHLBI has supported the development of clinical practice guidelines that have addressed prevention, assessment, and management of three important modifiable risk factors in the adult population: high blood cholesterol, high blood pressure, and overweight/obesity (Table 1). In 1998, the NHLBI released Clinical Guidelines on the Identification, Evaluation, and Treatment of Obesity and Overweight in Adults: The Evidence Report (2). This was followed by Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III), published in 2002 (3), and The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, published in 2004 (4).

In 2008, the NHLBI convened three Expert Panels and formed two Lifestyle, Risk Assessment, and Implementation Workgroups to provide crosscutting input to the three risk factor Expert Panel Reports. To provide continuity, members of the Workgroups also served on the Overweight/Obesity, Blood Pressure, and Cholesterol Risk Factor Panels.

The relevant Lifestyle and Risk Assessment report recommendations were adopted and endorsed by the Panels. For example, the Blood Pressure and Cholesterol Panels endorsed the Lifestyle Workgroup Recommendations on blood pressure...
and low-density lipoprotein cholesterol (LDL-C) management, respectively.

The Panels addressed critical scientific questions of importance to clinical practice. For example, the Overweight/Obesity Expert panel examined the associations between body weight and cardiovascular events, effects of various diets and bariatric surgery on body weight and cardiovascular risk factors, and the effectiveness of a range of interventions for weight loss. The Blood Cholesterol Expert Panel reviewed evidence on specific LDL-C levels when treating adults with or without existing CVD and the effectiveness and safety of specific pharmacotherapy to treat elevated LDL-C. The Blood Pressure Panel sought to determine the optimal blood pressure level to target for treatment and the impact of various drug therapies on clinical outcomes.

The crosscutting Work Groups addressed critical questions that informed the risk factor Panels. The Lifestyle Work Group studied the effects of dietary patterns, dietary fat and cholesterol, sodium and potassium intake, and physical activity on blood pressure and lipids. The Work Group also studied the effect of sodium and potassium intake on CVD events. The Risk Assessment Work Group studied models designed to assess the long-term risk of a cardiovascular event in adults who have a lower short-term risk. The Work Group also examined whether adding newly identified risk markers, such as C-reactive protein, could improve risk reduction.

**Formation of Panels and Workgroups**

The selection of a balanced Expert Panel is important in the development of a useful evidence review or clinical guideline (5). To ensure adequate representation of important specialties among Expert Panels, the NHLBI initiated a call for nominations for Panel membership. The public could nominate or individuals could self-nominate candidates for the Expert Panels. Information from nomination forms was entered into a database. NHLBI staff reviewed the database and selected potential chairs for each Panel. An executive committee, comprising the Panel and Workgroup chairs, worked with the NHLBI to select Panel members from the list of nominees. To ensure continuity of the evidence review process, members were encouraged to attend as many Panel meetings as possible. NHLBI and contract staff were assigned to each Panel to provide support on methodology, report coordination, research analysis, and science writing.

**Systematic Review Methodology**

The NHLBI CVD systematic reviews were conducted using rigorous methodology. Methodology staff from Research Triangle International and Science Applications International Corporation supported the Expert Panels to ensure high-quality evidence reviews that met most of the Institute of Medicine (IOM) Standards for Systematic Reviews (5). In-depth reviews of the methodology for each of the CVD prevention systematic evidence reviews and Study Assessment Tools are available at http://www.nhlbi.nih.gov/guidelines.

**New Collaborative Model for Guideline Development**

During the period in which the Expert Panels and Work Groups were undertaking new evidence-based approaches to updating the guidelines, the methodology for guidelines development evolved significantly. In 2011, the IOM issued two reports that established new “best practice” standards for generating systematic evidence reviews (5) and developing clinical practice guidelines (6). The reports underscore that these are two separate yet related activities that require careful coordination. In consideration of the changing approaches to guideline development, the NHLBI’s Advisory
Council recommended in June 2012 that the IOM transition to a new model that focused its primary effort on the generation of high-quality systematic reviews and support of the development of clinical practice guidelines through partnerships with professional societies and other organizations (7). The NHLBI would continue to play an important role in guideline development by supporting high-quality systematic evidence reviews and funding research where evidence gaps exist (Figure 1) (8,9).

The American Heart Association (AHA) and the American College of Cardiology (ACC) spearheaded the collaborative development of CVD prevention guidelines using the adult CVD evidence reviews. Guidelines on blood cholesterol (10,11), overweight/obesity (12–14), lifestyle (15,16), and risk assessment (17,18) were published in November 2013 in Circulation, the Journal of the American College of Cardiology, and Obesity. The crosscutting implementation workgroup evidence review report and recommendations will be published by the Workgroup in the scientific literature. In addition, the NHLBI is publishing the five evidence review reports on the NHLBI website at http://www.nhlbi.nih.gov/guidelines.

References


### Glossary of Guideline Development Terms

**Clinical Practice Guidelines:** Systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances.

**Critical Questions:** Clinically relevant and answerable research questions created to benefit patients and clinicians. One method of drafting the questions is PICO (population, intervention, comparison, outcomes).

**Quality of Evidence:** The level of confidence or certainty in a conclusion reached about the issue to which the evidence relates.

**Systematic Evidence Review:** A scientific investigation that focuses on a specific question and uses explicit, prespecified scientific methods to identify, select, assess, and summarize the findings of similar but separate studies.

**Strength of Recommendations:** A rating system that includes: 1) quality of relevant evidence, 2) comparison of the benefits and harms, and 3) value judgments about the importance of specific benefits and harms.

**Crosscutting Work Groups:** Groups of professionals convened to support a standardized and coordinated approach to evidence reviews.
Abstract
The new cholesterol guideline, 2013 American College of Cardiology (ACC)/American Heart Association (AHA) Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular Risk in Adults, represents a substantial change from the previous standard of practice. It focuses on appropriate statin medication use and intensity of therapy rather than low-density lipoprotein cholesterol (LDL-C) targets to reduce atherosclerotic cardiovascular disease (ASCVD) risk. Additionally, the guideline recommends a new risk calculator to estimate patients’ 10-year ASCVD risk when determining primary prevention strategies. Finally, the guideline addresses safety recommendations for statins, particularly as related to myalgia adverse effects.

Four Statin Benefit Groups
Using data from randomized, controlled trials (RCTs) as well as systematic reviews and meta-analyses of RCTs, the Blood Cholesterol Expert Panel recommended the use of statin drugs in four primary groups of patients. Based on the research, they contend that these “four statin benefit groups” represent people in whom the potential for ASCVD risk reduction benefit clearly exceeds the potential for adverse effects (Table 1) (1).

The first three statin benefit groups include patients who already are treated routinely: those with clinical ASCVD, those with very high LDL-C levels, and those with diabetes. The caveat in Group 1 “without New York Heart Association class II through IV heart failure or on hemodialysis” is new in these guidelines. The Expert Panel did not make any recommendations for or against initiating or continuing statin therapy due to the lack of sufficient RCT data. The decision to use statin drugs in these patients must be made on a case-by-case basis.

Inclusion of the fourth statin benefit group represents the greatest change from previous guidelines and is the most controversial aspect of the new guidelines. Prescribing statin drugs to the patients in group 4 is strictly for primary prevention. It
targets patients without clinical disease or diabetes, who are ages 40 to 75 years, who have LDL-C values of 70 to 189 mg/dl, and who have a risk level considered high enough to warrant statin therapy. The New Pooled Cohort Equation (Risk Calculator) was developed to help determine which patients in this group should receive statin therapy.

**Pooled Cohort Equation (Risk Calculator)**

The Pooled Cohort Equation for ASCVD risk prediction was developed by the Risk Assessment Work Group to help identify a patient's 10-year risk for developing a first ASCVD event, defined as death from coronary heart disease, nonfatal myocardial infarction, or stroke (nonfatal or fatal). The guideline recommends using the predicted 10-year ASCVD risk to guide initiation of statin therapy. The calculator is available online at www.myamericanheart.org/cvriskcalculator or www.clincalc.com. An app for the calculator also is available to download and use on a smart phone.

Following input of the patient’s sex, age, ethnicity (Caucasian/non-Caucasian vs African American), total cholesterol, high-density lipoprotein cholesterol (HDL-C), systolic blood pressure, whether the patient is receiving treatment for hypertension, whether the patient has diabetes, and whether the patient is a smoker, the calculator displays the patient’s 10-year ASCVD risk. The new guideline recommends initiation of statin treatment if the patient’s estimated 10-year ASCVD risk is 7.5% or higher and consideration of treatment if the risk is 5% to 7.5%.

The lifetime risk of developing ASCVD is also displayed but is only valid for patients between 20 and 59 years of age and is only recommended for use when discussing lifestyle changes. The risk calculator should be used ONLY for primary prevention (patients without ASCVD) in patients 40 to 75 years of age with an LDL-C value of 70 to 189 mg/dl. It is not intended for patients who are already treated with statin medications, but if the clinician decides to use it on a treated patient, the patient’s pretreatment total cholesterol and HDL-C values should be input.

Substantial controversy surrounds this new risk calculator. Many Expert Panel members had current or recent ties to drug manufacturers while serving on the Panel, which may have contributed to conflicts of interest (2). The risk calculator also has been criticized for overestimating risk, in some cases as much as 150% when applied to people in the Women’s Health Study and the Physician’s Health Study (3), and for having thresholds over which risk increases dramatically (i.e., turning 55 years old increases a patient’s risk substantially). However, recent research in a large, more diverse population (4) has validated the ACC/AHA Pooled Cohort risk equations, lending credibility to the new risk calculator. The guideline also lowers the threshold for initiating statin therapy. An estimated 920 million people worldwide would be considered statin candidates if the guidelines were applied to a global population (5).

**What About Patients Who Do Not Clearly Fall Within the Four Statin Benefit Groups?**

Some patients for whom statin therapy may be considered do not clearly fall into the four statin benefit groups. These include people with a strong family history of premature coronary artery disease, pregnancy-related hypertension or diabetes, and autoimmune diseases. For example, because the risk calculator is used for patients starting at age 40, it does not help in determining the ASCVD risk for a 38-year-old man who has an LDL-C of 160 mg/dl, no other risk factors, and a father had a myocardial infarction at the age of 43 years.

If the clinician believes an individual patient’s risk may be under- or overestimated by the new risk calculator, the guideline recommends considering other factors, such as family history of premature coronary heart disease, high-sensitivity C-reactive protein value greater than 2 (increased level of inflammation), or a high-risk coronary artery calcium score greater than 300 or greater than the 75th percentile. When deciding whether to recommend a statin medication, health care practitioners should talk to patients about the potential for risk reduction with the drug, possible adverse effects, and potential drug-drug interactions to elicit patient preferences. These discussions take time but are necessary. Statins should never be prescribed to women of childbearing potential unless they are using effective contraception and are not nursing. Whether or not statins are prescribed, lifestyle modification is the foundation of all efforts to reduce ASCVD and should form the basis of the clinician-patient discussion.

**No More LDL-C Treatment Goals?**

The 2013 ACC/AHA Expert Panel was unable to find evidence from RCTs to support the use of specific LDL-C and/or non-HDL-C treatment goals. Therefore, they instead recommend using appropriate high- or moderate-intensity statins (Table 2).
The National Lipid Association (NLA) did not agree with removal of the LDL-C (and non-HDL-C) treatment targets. They also expressed concern about the absence of discussion about other therapeutic options beyond statin drugs for patients who may have high residual risk and/or significantly elevated LDL-C levels despite receiving high-dose statins (6). Although they worked with the ACC and AHA during guideline development, the NLA ultimately did not endorse the 2013 ACC/AHA cholesterol guideline and are currently working on their own recommendations for patient-centered management of dyslipidemia (7).

**Statin-induced Myalgias**

Myalgia, muscle pain without creatine kinase (CK) elevation, are reported to occur in 1% to 5% of patients in statin RCTs, which are very controlled situations with carefully screened patients, and in 9% to 20% of nonselected outpatients in observational statin studies (8). In the PRIMO study, a large observational study of muscle symptoms in an unselected population, such symptoms occurred in 10.5% of patients (9). The incidence of severe myositis (muscle pain with CK elevation) and rhabdomyolysis (muscle pain with CK elevation at least 10 times the upper limit of normal) are extremely rare at 0.04% to 0.08% and 0.01% to 0.02%, respectively (10).

One approach to preventing statin-induced myalgias is to avoid drug combinations that may increase the risk of statin toxicity (e.g., simvastatin plus human immunodeficiency virus protease inhibitors or general statins plus gemfibrozil, certain antifungals and antibiotics, cyclosporin, and red yeast rice, which also contains a statin). In addition, clinicians should limit the dose of simvastatin in patients also prescribed amlodipine, diltiazem, and amiodarone and follow all United States Food and Drug Administration safety alerts and package inserts.

According to the new cholesterol guideline, moderate-intensity statins, rather than high-intensity statins, should be used in patients who have characteristics that predispose them to statin adverse effects, such as multiple or serious comorbidities, including impaired renal or hepatic function, history of previous statin intolerance or muscle disorders, unexplained alanine amino transferase elevations greater than 3 times the upper limit of the normal range, concomitant use of drugs affecting statin metabolism, and age older than 75 years.

If patients develop myalgias, the clinician should stop the statin and evaluate for potential causes, such as hypothyroidism, concomitant use of drugs that may increase the risk of statin toxicity as previously discussed, or vitamin D deficiency. After the symptoms abate, which usually occurs over a few days to several weeks, the clinician should restart the statin at a lower dose or switch to a low dose of a different statin. If the myalgias are very severe or are accompanied by muscle weakness and/or significantly elevated CK levels, serum creatinine and urine myoglobin should be measured to evaluate for rhabdomyolysis, a rare but very serious condition.

Statin-intolerant patients may be able to tolerate very low-dose statin therapy with doses as low as 1.25 mg rosuvastatin every other day. This small dose can still be effective at lowering LDL-C, but RCT data are severely lacking in these types of patients.

**Non-statin Medications**

Non-statin cholesterol-lowering medications may be considered when high-risk patients have an inadequate response to statins, are unable to tolerate a less-than-recommended statin intensity, or are

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**Table 2. Recommendations for Lipid-Lowering Therapy**

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Statin Intensity</th>
<th>Drug Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Clinical ASCVD (21 to 75 years)</td>
<td>High</td>
<td>Atorvastatin 40 to 80 mg Rosuvastatin 20 to 40 mg</td>
</tr>
<tr>
<td>– LDL-C ≥190 mg/dL</td>
<td>LDL-C level decreases by ≥50%</td>
<td></td>
</tr>
<tr>
<td>– Diabetes (40 to 75 years) with 10-year ASCVD risk ≥7.5%</td>
<td>Moderate</td>
<td>Atorvastatin 10 to 20 mg Rosuvastatin 5 to 10 mg Simvastatin 20 to 40 mg Pravastatin 40 to 80 mg Lovastatin 40 mg Fluvastatin 40 mg BID or XL 80 mg daily Pitavastatin 2 to 4 mg</td>
</tr>
<tr>
<td>– Age &gt;75 years with clinical ACSVD</td>
<td>LDL-C level decreases by 30% to 49%</td>
<td></td>
</tr>
<tr>
<td>– Individuals who cannot tolerate high-intensity therapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Diabetes (40 to 75 years) with 10-year ASCVD risk &lt;7.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– No diabetes (40 to 75 years) with 10-year ASCVD risk ≥7.5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
completely intolerant to statins (1). Non-statin medication classes to consider include cholesterol-absorption inhibitors (e.g., ezetimibe), bile acid sequestrants (e.g., coleselam), niacin, fibrates (e.g., fenofibrate), and fish oil. Fenofibrate and/or high-dose fish oil should be used initially in patients with severe hypertriglyceridemia (>500 mg/dl) due to the risk of pancreatitis. Gemfibrozil should not be administered concomitantly with a statin due to the risk of rhabdomyolysis.

Refer When Appropriate
Of note, “The Expert Panel acknowledges that our process did not provide for a comprehensive approach to the detection, evaluation, and treatment of lipid disorders as was done in the prior ATP III Report. However, these guidelines were never intended to be a comprehensive approach to lipid management for purposes other than ASCVD risk reduction…For the many questions regarding complex lipid disorders that are beyond the scope of our systematic evidence review, or for which little or no RCT data are available, it is anticipated that clinicians with lipid expertise can contribute to their management” (1).

Summary
The 2013 ACC/AHA Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular Risk in Adults differs substantially in scope and content from the previous ATP III guideline. Instead of meeting specific LDL-C goals, the emphasis is on using the appropriate intensity of statin medications in the four patients groups that are most likely to benefit from such therapy. Recognizing and treating statin-induced myalgias are of paramount importance. Non-statin cholesterol-lowering medications may be considered in special circumstances, and patients with complex lipid disorders should be referred to clinicians with expertise in lipid management. Lifestyle modification remains a critical component of health promotion and ASCVD risk reduction, both before and in concert with cholesterol-lowering drug therapies.

References
2. Lenzer J. Majority of panelists on controversial new cholesterol guideline have current or recent ties to drug manufacturers. BMJ. 2013;347:f6989.
Abstract
Heart disease remains the #1 cause of death in the United States for both men and women (25% of all deaths) (1). However, for those with diabetes, the risk of death related to some form of heart disease approaches 68% (1). The 2013 Guideline on Lifestyle Management to Reduce Cardiovascular Risk, a report of the American Heart Association (AHA) and American College of Cardiology (ACC) Task Force on Practice Guidelines, was released in November 2013 (2). In this article, we review the lifestyle management recommendations (Table 1) developed from the review of evidence on diet and physical activity and their relationship to cardiovascular (CV) risk factors and outcomes.

Introduction
In 2008, the National Heart, Lung and Blood Institute (NHLBI) convened an Expert Panel to develop specific critical questions (CQ) (Table 2) to aid in developing guidelines for lifestyle modifications to reduce CV risk. The Panel was charged with interpreting the evidence related to these CQs through systematic reviews and creating recommendations for the 2013 Guideline on Lifestyle Management to Reduce Cardiovascular Risk. In June 2013, the NHLBI began collaborating with the AHA and ACC to partner with other professional organizations and stakeholders to finalize the guidelines. Of note, the National Institute of Diabetes and Digestive and Kidney Diseases was represented in the Expert Work Group (2).

The three CQs pertain specifically to the potential effects of dietary pattern, sodium and potassium intake, and types and levels of physical activity on the modifiable risk factors of lipids and blood pressure (BP) that might prevent the development of cardiovascular disease (CVD). Specific evidence statements (ESSs), aligned with the CQs and graded by strength of evidence from the systematic reviews, were used to derive ten lifestyle recommendations. The recommendations apply to adults between the ages of 18 and 80 years with and without CVD (2).

The target audience for the recommendations is primary care providers (2). Because those with diabetes have a two- to fourfold increased risk of heart disease and stroke (1), it is imperative that medical professionals caring for patients with diabetes have a working knowledge of these new lifestyle guidelines for CV risk reduction.

CQ1. Dietary Patterns and Macronutrients
Because foods are generally not consumed individually, but rather in meals and with other foods, more recent interventional and observational studies have used dietary patterns with defined macronutrient content to determine intake and risk factor associations. The ESSs for dietary pattern and macronutrients were derived from studies in which adults were supplied with foods that conformed to the Dietary Approaches to Stop Hypertension (DASH) dietary pattern (Table 3) (2). The results were compared to adults who consumed a typical 1990s American diet (TAD) (Table 3) and whose body weight was stable (2). For the review of lipid-lowering ability, the ESSs included a total cholesterol level of less than 260 mg/dL and a low-density lipoprotein cholesterol (LDL-C) level of less than 160 mg/dL. The strength of the evidence was high for lipid-lowering in the entire study population (men, women, African Americans, non-Hispanic whites, and other minorities) for those following a DASH diet compared to those consuming a TAD. The average LDL-C reduction was 11 mg/dL, high-density lipoprotein-cholesterol (HDL-C) decreased 4 mg/dL, and there was no effect on triglycerides (TGs) (4). A secondary analysis of the DASH trial showed the same degree of lipid reduction in each of the study subpopulations, although the strength of that evidence was low (5).
Table 1. Summary of Recommendations for Lifestyle Management

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>NHLBI Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIET</strong></td>
<td></td>
</tr>
<tr>
<td>LDL-C - Advise adults who would benefit from LDL-C lowering* to:</td>
<td>A (Strong)</td>
</tr>
<tr>
<td>1. Consume a dietary pattern that emphasizes intake of vegetables, fruits, and whole grains; includes low-fat dairy products, poultry, fish, legumes, nontropical vegetable oils and nuts; and limits intake of sweets, sugar-sweetened beverages and red meats.</td>
<td>A (Strong)</td>
</tr>
<tr>
<td>a. Adapt this dietary pattern to appropriate calorie requirements, personal and cultural food preferences, and nutrition therapy for other medical conditions (including diabetes mellitus).</td>
<td></td>
</tr>
<tr>
<td>b. Achieve this pattern by following the plans such as the DASH dietary pattern, the USDA Food Pattern, or the AHA Diet.</td>
<td></td>
</tr>
<tr>
<td>2. Aim for a dietary pattern that achieves 5% to 6% of calories from saturated fat.</td>
<td>A (Strong)</td>
</tr>
<tr>
<td>3. Reduce percent of calories from saturated fat.</td>
<td>A (Strong)</td>
</tr>
<tr>
<td>4. Reduce percent of calories from trans fat.</td>
<td>A (Strong)</td>
</tr>
<tr>
<td><strong>BP - Advise adults who would benefit from BP lowering to:</strong></td>
<td></td>
</tr>
<tr>
<td>1. Consume a dietary pattern that emphasizes intake of vegetables, fruits, and whole grains; includes low-fat dairy products, poultry, fish, legumes, nontropical vegetable oils and nuts; and limits intake of sweets, sugar-sweetened beverages and red meats</td>
<td>A (Strong)</td>
</tr>
<tr>
<td>a. Adapt this dietary pattern to appropriate calorie requirements, personal and cultural food preferences, and nutrition therapy for other medical conditions (including diabetes mellitus).</td>
<td></td>
</tr>
<tr>
<td>b. Achieve this pattern by following the plans such as the DASH dietary pattern, the USDA Food Pattern, or the AHA Diet.</td>
<td></td>
</tr>
<tr>
<td>2. Lower sodium intake.</td>
<td>A (Strong)</td>
</tr>
<tr>
<td>3.</td>
<td>B (Moderate)</td>
</tr>
<tr>
<td>a. Consume no more than 2,400 mg of sodium/day;</td>
<td></td>
</tr>
<tr>
<td>b. Further reduction of sodium intake to 1,500 mg/day is desirable since it is associated with even greater reduction in BP; and</td>
<td></td>
</tr>
<tr>
<td>c. Reduce intake by at least 1000 mg/day since that will lower BP, even if the desired daily sodium intake is not yet achieved.</td>
<td></td>
</tr>
<tr>
<td>4. Combine the DASH dietary pattern with lower sodium intake</td>
<td>A (Strong)</td>
</tr>
<tr>
<td><strong>PHYSICAL ACTIVITY</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Lipids</strong></td>
<td>B (Moderate)</td>
</tr>
<tr>
<td>1. In general, advise adults to engage in aerobic physical activity to lower BP: 3 to 4 sessions a week, lasting on average 40 minutes per session, and involving moderate-to-vigorous intensity physical activity.</td>
<td></td>
</tr>
<tr>
<td><strong>BP</strong></td>
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</tr>
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<td></td>
</tr>
</tbody>
</table>

*Refer to 2013 Blood Cholesterol Guideline for guidance on who would benefit from LDL-C lowering (Stone 6)

AHA, American Heart Association; BP, blood pressure; DASH, Dietary Approaches to Stop Hypertension; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; NHLBI, National Heart, Lung, and Blood Institute; and USDA, U.S. Department of Agriculture.

Source: American Heart Association, Inc.
Reductions in LDL-C were achieved when the dietary pattern included a reduction in saturated fat from an average of 14% to 15% to an average of 5% to 6% (4). Of note, any reduction in saturated fat consumption was associated with a lowering of both LDL-C and HDL-C, with the greatest effect on LDL-C (4). Current intake of saturated fat in the United States is estimated at 11% of calories (6), which differs from the DASH guidelines. Therefore, the Work Group recommended that adults who would benefit from lowering of LDL-C, particularly those with a current intake of greater than 11% saturated fat, reduce their intake of saturated fats to a goal of 5% to 6% of calories. Saturated fat should first be replaced by polyunsaturated fat, then monounsaturated fat, and lastly complex carbohydrates to provide the most favorable effects on lipid profiles (2).

Whether trans fat was replaced equally at 1% of energy with either saturated, polyunsaturated, or monounsaturated fats or by complex carbohydrate, the effects on lipids were either positive, with lowering of LDL-C and TG concentrations and increases or neutral (no effect) effects on HDL-C. The Work Group’s recommendation, knowing that trans fat occurs naturally in meat and dairy, is to continue to reduce intake of trans fat from partially hydrogenated oils and follow the guidelines for choosing lean meats and low-fat dairy products (2).

It is important to note that there is no recommendation concerning dietary cholesterol intake. The Work Group found that “there is insufficient evidence to determine whether lowering dietary cholesterol reduces LDL-C (2).”

The ES for BP included food being supplied to adults ages 25 to 80 years with BPs of 120 to 159/80 to 95 mm Hg and stable body weights. The DASH dietary pattern was compared to the TAD, and sodium intake was kept stable or not included as a variable. The strength of the evidence was high, with systolic and diastolic BPs lowered 5 to 6 mm Hg and 3 mm Hg, respectively, in all adults: men, women, African American, non-African American, younger, older, and with or without hypertension (2). More specific information on the effects of sodium and potassium on BP with and without the DASH dietary pattern are discussed in more detail in the next section.

### CQ2. Sodium and Potassium

CQ2 examined studies that assessed the impact of sodium and potassium on BP and CV outcomes of morbidity and mortality. Although most vitamins and minerals are consumed in food, it is possible to isolate the effects of sodium and potassium, whose intake has been associated with CVD risk factors and outcomes (2). Most foods contain small amounts of naturally occurring sodium; the majority of sodium intake (77%) comes from that added to foods. Thus, sodium intake can be modified without changing overall dietary patterns. Potassium has generally been hypothesized to lower BP and may modulate the effect of sodium intake (2).

The ES for sodium intake concluded that reducing sodium intake lowered BP based on high-strength evidence. Reducing sodium intake from 3,300 mg/day to 2,400 mg/day lowered systolic and diastolic BPs by 2 mm Hg.
and 1 mm Hg, respectively, according to moderate-strength evidence. Finally, reducing sodium intake to 1,500 mg/day lowered systolic and diastolic BPs by 7 mm Hg and 3 mm Hg, respectively, based on moderate-strength evidence. Strength of evidence was high for counseling adults to reduce sodium by 1,150 mg/day, which was shown to reduce systolic and diastolic BPs by 3 to 4 mm Hg and 1 to 2 mm Hg, respectively. Although the strength of the evidence was low, decreasing sodium intake by about 1,000 mg/day was found to reduce CVD events by about 30%, while a higher sodium intake was associated with a greater risk of stroke and CVD (2).

In adults with prehypertension and hypertension, reducing sodium intake lowered BP in men and women, older and younger, and African American and non-African American adults with high strength of evidence (2). Among adults eating a TAD or DASH dietary pattern, sodium intake reduction lowered BP in adults with either prehypertension or hypertension but had a greater effect in those with hypertension with strength of evidence high. Based on evidence of moderate strength, the combination of eating the DASH dietary pattern and reducing sodium intake lowered BP more than sodium reduction alone (2).

In contrast, the ES concerning the effect of potassium intake found insufficient evidence to determine whether increasing dietary potassium intake would lower BP or affect coronary heart disease, heart failure, and CV mortality. Evidence of low strength suggested that higher dietary potassium intake was associated with lower stroke risk (2).

**CQ3: Physical Activity: Lipids and BP**

Based on extensive epidemiologic evidence, higher levels of physical activity (PA) were linked to lower rates of CVD and chronic diseases such as type 2 diabetes mellitus (7). Of note, the amount of PA needed to realize the benefits and risk reductions appeared to be a dose-dependent (8). Circumstances producing such risk reductions are believed to be due to beneficial effects on lipids, lipoproteins, and BP (2).

The Work Group’s search for evidence to answer CQ3 was limited to systematic reviews, meta-analyses of randomized, controlled trials, and individual controlled clinical trials published from 2001 through 2011. Evidence from trials with PA interventions of any type was considered. Only trials with PA versus no PA were examined; those with any other interventions, such as dietary changes or weight loss, were not considered. As a starting point, the Work Group examined the 2008 Physical Activity Guidelines Advisory Committee Report (2).

ESs were developed relating to aerobic and resistance exercise training and their separate effects on lipids. The evidence supporting the statements regarding aerobic exercise was moderate in strength and included: aerobic physical exercise alone compared to control interventions on average reduced LDL-C 3.0 to 6.0 mg/dL, reduced non-HDL-C 6 mg/dL, and had no consistent effect on either TG or HDL-C (2).

Compared to control interventions, resistance training reduced LDL-C, TG, and non-HDL-C by 6 to 9 mg/L on average but had no effect on HDL-C (2). Although resistance training appeared to lower lipid concentrations more effectively than aerobic physical exercise, the evidence to support this contention was rated low in strength.

The strength of evidence supporting the lowering effects of PA on BP was evaluated as high. It was concluded that on average, aerobic exercise training of moderate-to-vigorous intensity, 3 to 4 days/week, and lasting 40 minutes/session for at least 12 weeks seemed to be effective in decreasing systolic BP an average of 2 to 5 mm Hg and diastolic BP an average of 1 to 4 mm Hg. This effect holds true among adult men and women at all BP levels, including people with hypertension. The Work Group’s review could not provide consistent evidence for BP reduction with resistance training (2).

The Work Group included a consensus statement on nutrition and PA to promote heart health that applies to the entire adult United States population. These statements are consistent with both the 2010 Dietary Guidelines for Americans and the 2008 Physical Activity Guidelines for Americans. They include the parameters of the dietary patterns in Table 1 (DASH, United States Department of Agriculture, and AHA) and encourage adapting these patterns to cultural preferences and medical conditions such as diabetes. Individuals should be encouraged to achieve and maintain a healthy weight. Aerobic PA should be included weekly and consisting of either 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity exercise (2).

**Clinical Applications**

Registered dietitians (RDs) and registered dietitian nutritionists (RDNs) can use the recommendations from 2013 AHA/ACC Guideline on
Lifestyle Management to Reduce Cardiovascular Risk to reduce the risks of CVD events in their patients with diabetes (2). It is essential that the RD and RDN understand the key features of these guidelines, what they mean to their practices, and how best to implement them. To translate these recommendations (Table 1) into dietary patterns and lifestyle changes, the RD and RDN should use available resources and information for nutrition counseling for patients with diabetes (Table 4).

The information and resources for lifestyle management incorporated in the DASH, AHA Diet and Lifestyle Recommendations, and 2010 Dietary Guidelines for Americans are consistent with Nutrition Recommendations and Interventions for Diabetes: A Position Statement of the American Diabetes Association (9) and The Standards of Medical Care in Diabetes–2014 (10). As always, in working with individual patients, the RD and RDN should adapt and individualize dietary patterns to appropriate energy requirements, personal and cultural food preferences, and nutrition therapy for other medical conditions, including diabetes.

**Table 4. Resources for Dietary Patterns**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Web Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>“The American Heart Association’s Diet and Lifestyle Recommendations”</td>
<td><a href="http://www.heart.org/HEARTORG_GettingHealthy/Diet-and-Lifestyle-Recommendations_UCM_305855_Article.jsp">www.heart.org/HEARTORG_GettingHealthy/Diet-and-Lifestyle-Recommendations_UCM_305855_Article.jsp</a></td>
</tr>
<tr>
<td>“USDA Food Patterns”</td>
<td><a href="http://www.cnpp.usda.gov/Publications/USDAFoodPatterns/USDAFoodPatternsSummaryTable.pdf">www.cnpp.usda.gov/Publications/USDAFoodPatterns/USDAFoodPatternsSummaryTable.pdf</a></td>
</tr>
</tbody>
</table>

Cathy A. Nonas, MS, RD and Barbara E. Millen, DrPH, RD, FADA

Learning Objectives:
After reading this, RDNs will be able to:
1. Describe the process used by AHA/ACC/TOS and NHLBI to develop these guidelines.
2. Delineate the key principles of the 2013 Management of Overweight and Obesity Guidelines and how RDNs can apply them to the prevention and management of overweight and obesity.
3. Identify the evidence-based options for weight loss that can be recommended to patient/clients based upon their health risk profile and individual needs and desires.
4. Discuss the key assets RDNs bring to the prevention and management of overweight and obesity.

History, Background and Context
Overweight and obesity is at epidemic proportions in the U.S., tipping the proverbial scales at 69%, 36% of these individuals are obese and the remainder are classified as being overweight (3). The leading cause of death in the U.S. remains cardiovascular disease (CVD). Approximately 68 million Americans have hypertension, 71 million have elevated LDL-Cholesterol which puts them at risk for CVD (4). Every organ of the body is affected by excess body weight and the heart is no exception. Overweight and obesity can lead to ventricular hypertrophy, higher risk of fatal and non-fatal stroke, high blood pressure and prediabetes and type 2 diabetes. These concerning facts led the National Heart Lung and Blood Institute (NHLBI) in 2005 to bring together thought leaders from clinical areas relevant to CVD to establish a process to integrate the science and clinical recommendations for CVD. This step led to the updating and integration of the blood pressure, cholesterol and obesity guidelines that had, in the past, been researched and disseminated through the NHLBI (3).

Panels of experts were selected to update these blood pressure, cholesterol and obesity guidelines. For the first time, panel members were also placed on two cross cutting work groups for the purpose of integrating the work of all of the expert panels. These cross cutting panels included a lifestyle panel to examine diet and physical activity related risks for CVD without weight loss and another panel to examine methods for assessing CVD risk. The tasks assigned to these panels were to develop guidelines that reflected the most recent evidence, determine where updates to the last set of guidelines were needed and to answer new questions that would enrich clinical practice and identify areas for future research.
Unique to the work of these panels and work groups was that the development of these NHLBI guidelines would use the same methods and structure to allow them to blend together as easily as possible when published. In all, there were 16 questions answered by the five panels; each of the 16 questions were further deconstructed into many sub-questions. The expert panels reviewed the evidence and then rated the strength of the evidence after an independent team rated the quality of thousands of peer reviewed published articles. Depending upon the last updated information, (in the case of the overweight and obesity panel it was 1998), data was culled from the last update until 2010/11.

It took five years, 23 meetings (conducted both virtual and in-person) and the examination of thousands of articles, to identify a sufficiently sound body of literature to answer each of the critical questions discussed in this summary. The expert panel for overweight and obesity included both practitioners and researchers.

Summary of the Research Literature Reviews
After the expert panel for overweight and obesity was selected and the questions and criteria identified, an independent, external company was hired by NHLBI to search the literature for each question, using criteria developed by the panel members. This external group then rated the quality of each of the studies as good, fair and poor with additional review and insight from the panel. From here, evidence tables were created. The panel then graded the evidence with the help of the external company to ensure that the grades were based on the evidence, not the clinical experience of expert panel members. When possible, only randomized clinical trials (RCTs) with either a “good” or “fair” rating were used as evidence. In some cases, RCTs were not available. If this was the case or in the case of certain questions where resources were not sufficient to review the original literature, then systematic reviews and observational studies were used. The study quality ratings were based on certain criteria such as:

1. Was the method of randomization adequate (i.e., use of randomly generated assignment)?
2. Were the groups similar at baseline on important characteristics that could affect outcomes (e.g., demographics, risk factors, co-morbid conditions)?
3. Was the overall drop-out rate from the study 20% or lower? (This was particularly difficult criteria for weight loss intervention studies.).
4. Was the differential drop-out rate (between treatment groups) 15% or lower?
5. Were all randomized participants included in the analysis of the group to which they were originally assigned, i.e., did the researchers use an intention-to-treat analysis?

The following are examples of the criteria for the quality ratings as well as some of the common flaws seen in the study designs:

A well-designed, well-executed RCT that adequately represented populations to which results were applied and directly assessed effects on health outcomes, was rated “high.” If, however, there were any differences in the treatment between randomized groups of subjects, this could result in a “fair” rating if there was a minor difference but not sufficient to invalidate the study, or “poor” rating if egregious and indicating significant risk of bias. For example, if one intervention group received dietary information and coupons to purchase certain foods, and the other group was given food but the group given food was also telephoned a couple of times, this would reduce the quality of the RCT because the two groups received different levels of treatment. Another factor leading to a lower rating was the lack of inclusion of an intent-to-treat analysis. Many studies had analysis strategies that did not include drop-outs, even when the drop-out rate in the study was substantial. This made the results look strong, but they were positively biased. Again, this led to certain studies being rated as “poor” and omitted from consideration by the panels and workgroups. It is the reason why from the thousands of studies culled a much smaller number were considered relevant in this systematic review.

Updating the 1998 Evidence Report on Overweight and Obesity
The first set of clinical guidelines for the treatment of overweight and obesity in adults was published in 1998 (5). The charge to that 1998 expert panel was twofold: 1) to cull the scientific literature from 1980-1997 and 2) to create recommendations for treatment for the practicing physician and other health care providers dealing with overweight and obese patients.

The 2013 guidelines add to the 1998 guidelines by reevaluating the association of body mass index (BMI) to CVD and its CVD risk factors. These updated guidelines used the same cutpoints for BMI because the Committee determined that there
was insufficient data to recommend a change in criteria for overweight and obesity. In addition, the 2013 guidelines answer some new, relevant questions such as which dietary strategies are most successful for weight loss, which components of lifestyle modification treatment are most efficacious and which surgical procedures produce better outcomes. The 2013 panel used a rigorous evidence-based approach that involved a systematic review of the evidence with priority given to RCTs. The treatment algorithm directs those in clinical practice to consider various types of weight loss treatment or weight maintenance, not just based on BMI, but also dependent upon the patient’s own interest, the individual’s health profile, and success or failure of methods already attempted. Therefore, although there are commonalities between the algorithms from 1998 and 2013, one result of the 2013 guidelines was to encourage health practitioners to think differently about obesity. Clinicians should consider overweight and obesity as a chronic metabolic disorder associated with significant morbidity and mortality. It requires long-term treatment and has a high rate of relapse. Nonetheless, while the amount of weight that most people can lose and maintain is relatively limited, available evidence demonstrates that even modest weight loss, 3-5% (6), confers significant health benefits and greater amounts of weight loss are associated with better outcomes.

The 2013 guideline focused recommendations on five specific critical questions (CQ): the first two dealt with the risks of overweight and obesity and the benefits of losing weight. The latter three questions dealt with treatment and include the work RDNs do to help patients/clients survive within an obesigenic environment.

CQ 1: Benefits of weight loss – Is weight loss good for your patient/client?

CQ2: Risks of overweight – How do you identify who is at risk sufficiently to mandate weight loss efforts?

CQ3: Diets for weight loss – What is the efficacy/effectiveness of the different dietary intervention strategies to promote weight loss?

CQ4: Comprehensive Lifestyle Intervention (Diet+Physical Activity + Behavioral Therapy) – What is the efficacy/effectiveness of a combined approach to achieving and maintaining weight loss?

CQ5: Bariatric surgery – What are the benefits and risks of the various procedures?

In exploring each of these questions, subquestions were developed and examined (for example, did effectiveness of the intervention differ by demographic or ethnic characteristics of the population?). The following are some of the evidence statements that were graded “high.”

– the greater the individual’s BMI, the greater the risk of CVD and type 2 diabetes (7,8);
– sustained weight loss of as little as 3-5% can result in meaningful improvements in the health profile (6);
– six months or more of lifestyle counseling produces the most successful outcomes (9–10);
– advise overweight and obese individuals who have lost weight to participate in a long-term (≥ 1 yr) comprehensive weight loss maintenance program (11,12,13);
– Weight loss at 2 to 3 years following a variety of surgical procedures in adults with presurgical BMI ≥ 30 varies from a mean of 20% to 35% of initial weight and mean difference from nonsurgical comparators of 14% to 37% depending on procedure (14–15).
– some 15 dietary regimens were found to be evidence-based and equally effective in inducing weight loss as long as they were calorie-restricted;

All of the above statements and references are detailed in the guidelines (1,2).

The research evidence demonstrated that all 15 evidence-based diets (see Table 1) reviewed performed equally well in promoting short and long-term weight loss in adults as long as the calorie intake was sufficiently restricted to induce weight reduction. For example, people following an “ad libitum” diet that severely restricted carbohydrates, still resulted in a lower-calorie intake and it was this calorie reduction, not the lower-carbohydrate intake, that seemed to result in weight loss.

These important findings indicate that RDNs and other health care providers, as appropriate, have a wide array of dietary intervention options to offer their clients for weight loss management. The 2013 overweight and obesity expert panel recommended that weight loss programs be tailored to the individual’s preferences and needs. It underscored that a “one size fits all” approach should be avoided in order to achieve long-term compliance and success. Among the challenges for the practitioner are to fully assess each individual’s health needs and
lifestyle characteristics and to interpret them fully in establishing a sound, personalized approach to weight management. (See for the purpose of one example, www.healthmain.com for an evidence-based approach to personalize weight management and other nutrition-related interventions and medical nutrition therapy.)

A comprehensive lifestyle intervention, consisting of diet, physical activity and behavioral therapy, providing onsite (in person) treatment in either group or individual sessions, weekly for the first month and then biweekly for 6 months, produced the greatest weight loss. Long-term programs, consisting of additional visits for more than a year, were most successful in reducing the amount of weight regain (12,13).

An interesting addition to the literature was the use of electronically delivered, comprehensive weight loss interventions (that is, web or other resources used in conjunction with health care professional contact). Although less efficacious than onsite, intensive comprehensive lifestyle intervention, electronic strategies/tools carried out in academic settings with the use of interactive websites, text messaging and/or emails as well as personalized feedback from trained interventionists (dietitians, behaviorists, and exercise specialists) have been shown to result in weight loss of up to 5 kg at 6-12 months in comparison to no or minimal intervention (16–18).

The Registered Dietitian Nutritionist

The 2013 guidelines are an important milestone for RDNs. They specifically recommend, for the first time, that lifestyle...
primary care and other health care providers refer overweight and obese patients to food and nutrition professionals (e.g., RDNs) for counseling on calorie-restricted dietary interventions. They also acknowledge the RDN as one of the qualified providers of comprehensive lifestyle interventions, the "gold standard" for weight management (weight loss and weight loss maintenance). This acknowledgement reflects the substantial evidence base reviewed by the expert panel including key professional backgrounds of providers of effective interventions for weight loss and weight loss maintenance. In exploring CQs 3 (diet strategies) the expert panel considered whether the RCTs of dietary interventions implemented largely by food and nutrition professionals in academic and health care environments were effective in promoting weight loss. These studies typically controlled physical activity and behavioral intervention methods across study arms. CQs 4 studies (comprehensive intervention) were typically conducted by trained interventionists (e.g., teams of RDNs, exercise specialists, and behavioralists) in university or health care settings and compared to "usual care" protocols (19).

It’s an opportune time for RDNs involved in weight management to embrace these 2013 overweight and obesity guidelines and advocate for their visibility and roles in the prevention and treatment of overweight and obesity in the population. No professional group was more strongly identified in this report as key in management of these conditions than RDNs. Multidisciplinary approaches were advocated and there is an opportunity for RDNs to lead and collaborate with others in seeking reimbursement for services and carrying out programs and initiatives in clinical, public health, worksite and educational settings where it is important to address the needs and problems facing Americans as they attempt to address weight-related issues.

Thank you to the individuals who reviewed and provided input to this article: Catherine M. Champagne, PhD, RDN, LDN, FADA, FAND, FTOS, Eileen Ford, MS, RD and Linda M. Gigliotti, MS, RD, CDE.

References:


2014 Evidence-based Guideline for the Management of High Blood Pressure in Adults: Summary and Clinical Implications

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Learning Objectives:
Cardiovascular disease (CVD) is the leading cause of death among those with diabetes, and hypertension, a significant contributor to CVD, commonly occurs in conjunction with diabetes. Registered dietitians (RDs), registered dietitian nutritionists (RDNs), and diabetes educators should understand the impact of the update for managing hypertension in the recently published 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults, Report from the Panel Members Appointed to the Eighth Joint National Committee (JNC 8). This article summarizes the nine key recommendations from the JNC 8 and how they may be used most appropriately by RDs, RDNs, and diabetes educators in clinical practice.

Background
Hypertension affects an estimated 77.9 million American adults and is affiliated with the majority of first strokes, first myocardial infarctions (MI), and cases of congestive heart failure (1). Patients with diabetes frequently possess many traits, such as obesity, that also increase the risk of hypertension, and the two diseases overlap with astonishing frequency: 75% to 85% of patients with diabetes also have hypertension (1). Clearly, the significance of the interaction between hypertension and diabetes cannot be overlooked in clinical practice. The JNC 8 offers new strategies for treating hypertension, including race-specific interventions for the African American population (2). In a departure from the JNC 7 Report (JNC 7), which was published in 2003, the newer JNC 8 guidelines eschew definition of the terms “hypertension” and “prehypertension” in favor of the establishment of more clinically relevant thresholds for pharmacologic treatment in various populations (2,3).
lifestyle recommendations, and other specialized topics. Instead, it focuses on three guiding questions: 1) In adults with hypertension, does initiating pharmacologic treatment at certain blood pressure thresholds improve health outcomes?, 2) In adults with hypertension, does treatment with antihypertensive medications to a specific blood pressure goal lead to improved health outcomes?, and 3) In adults with hypertension, do various antihypertensive drugs or drug classes differ in comparative benefits or harms? Each of the questions was investigated using only data from randomized, controlled trials (RCTs), generally considered the reference standard for medical research. The Panel faced many gaps in the RCT literature and substantial controversy over some recommendations. The resultant secondary prevention guideline is built on the principles of evidence-based medicine but with significant limitations. As with other guidelines, the JNC 8 recommendations must be used judiciously by RDs, RDNs, and diabetes educators.

**Summary of JNC 8 Recommendations**

The evidence for JNC 8 included RCT trials conducted exclusively among hypertensive patients with or without comorbidities from January 1966 to August 2013. Relevant inclusion criteria were (2):
- Only RCTs
- Conducted between January 1966 and August 2013
- Minimum 1-year follow-up
- Sample size >100 patients
- Clinically relevant outcomes such as mortality, MI, heart failure, stroke, revascularization procedures, or renal failure

Only studies with a minimum National Heart, Lung, and Blood Institute quality grade of “fair” were included, meaning that each study had a low risk of bias and high internal validity (4). Each of the three guiding questions generated evidence statements that were based on 25, 37, and 64 studies, respectively (4). Evidence statements for each question were collated into clinical recommendations for several categories of patients, including those older and younger than 60 years of age, African American and non-African American patients, patients with or without chronic kidney disease (CKD), and patients with or without diabetes. Panel members judged the evidence supporting each evidence statement and voted to assign an evidence quality rating of "low," "moderate," or "high." Similarly, each of the nine clinical recommendations was judged for the strength of the recommendation and assigned a grade of A (strong recommendation) to E (expert opinion). The final recommendations are (2):

1. In the general population aged ≥60 years, initiate pharmacologic treatment to lower blood pressure (BP) at systolic blood pressure (SBP) ≥150 mm Hg or diastolic blood pressure (DBP) ≥90 mm Hg and treat to a goal SBP <150 mm Hg and goal DBP <90 mm Hg. (Strong Recommendation – Grade A)
   a. Corollary Recommendation: In the general population aged ≥60 years, if pharmacologic treatment for high BP results in lower achieved SBP (e.g., <140 mm Hg) and treatment is well tolerated and without adverse effects on health or quality of life, treatment does not need to be adjusted. (Expert Opinion – Grade E)
2. In the general population <60 years, initiate pharmacologic treatment to lower BP at DBP ≥90 mm Hg and treat to a goal DBP <90 mm Hg. (For ages 30-59 years, Strong Recommendation – Grade A; For ages 18-29 years, Expert Opinion – Grade E)
3. In the general population <60 years, initiate pharmacologic treatment to lower BP at SBP ≥140 mm Hg and treat to a goal SBP <140 mm Hg. (Expert Opinion – Grade E)
4. In the population aged ≥18 years with chronic kidney disease (CKD), initiate pharmacologic treatment to lower BP at SBP ≥140 mm Hg or DBP ≥90 mm Hg and treat to goal SBP <140 mm Hg and goal DBP <90 mm Hg. (Expert Opinion – Grade E)
5. In the population aged ≥18 years with diabetes, initiate pharmacologic treatment to lower BP at SBP ≥140 mm Hg or DBP ≥90 mm Hg and treat to a goal SBP <140 mm Hg and goal DBP <90 mm Hg. (Expert Opinion – Grade E)
6. In the general nonblack population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic, calcium channel blocker (CCB), angiotensin-converting enzyme inhibitor (ACEI), or angiotensin receptor blocker (ARB). (Moderate Recommendation – Grade B)
7. In the general black population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic or CCB. (For general black population: Moderate Recommendation – Grade B; for black patients with diabetes: Weak Recommendation – Grade C)
8. In the population aged ≥18 years with CKD, initial (or add-on) antihypertensive treatment should include an ACEI or ARB to improve kidney outcomes. This applies to all CKD patients with hypertension regardless of race or diabetes status. (Moderate Recommendation – Grade B)

9. The main objective of hypertension treatment is to attain and maintain goal BP. If goal BP is not reached within 1 month of treatment, increase the dose of the initial drug or add a second drug from one of the classes in recommendation 6 (thiazide-type diuretic, CCB, ACEI, or ARB). The clinician should continue to assess BP and adjust the treatment regimen until goal BP is reached. If goal BP cannot be reached with two drugs, add and titrate a third drug from the list provided. Do not use an ACEI and an ARB together in the same patient. If goal BP cannot be reached using only the drugs in recommendation 6 because of a contraindication or the need to use more than three drugs to reach goal BP, antihypertensive drugs from other classes can be used. Referral to a hypertension specialist may be indicated for patients in whom goal BP cannot be attained using the above strategy or for the management of complicated patients for whom additional clinical consultation is needed. (Expert Opinion – Grade E)

Of these nine recommendations, those pertaining to adults older than 60 years, adults younger than 60 years without comorbidities, and adults with diabetes affect RDs, RDNs, and diabetes educators most profoundly. Understanding the evidence for the recommendations pertaining to these populations should facilitate their clinical application.

Recommendations for Adults Older Than 60 Years

The recommendation to raise the treatment threshold for adults in this age group to a BP of 150/90 mmHg was based on four studies that evaluated fatal and nonfatal stroke as primary outcomes and fatal MI, heart failure, and coronary artery disease as secondary outcomes (2,3,5–8). When this target BP was attained, strong evidence suggested that the risk of cerebrovascular disease decreased and moderate evidence suggested that cardiovascular events decreased (5–8). Furthermore, a reduction of SBP below 140 mm Hg was not associated with decreased cardiovascular events or renal failure (9,10). However, all JNC 8 panel members could not agree on the recommendation of a goal SBP of 150 mm Hg for adults older than 60 years. The JNC 7 inclusion criterion for SBP in otherwise healthy adults age 60 years and older was an SBP of 140 to 149 mm Hg, and many groups have advocated for this value as an appropriate BP target (11–14). In the absence of studies that allowed treated BP to rise from less than 140 mm Hg to less than 150 mm Hg, it is recommended that treatment continue unaltered in patients with SBPs lower than 140 mmHg. This is based on the observation that SBP values were close to 140 mm Hg in patients randomized to the “higher” SBP groups and the fact that treatment to an SBP of less than 140 mm Hg is generally well tolerated (2). However, allowing treated SBP to rise closer to 150 mmHg may have benefits, such as reducing the number of necessary antihypertensive agents, and this question merits further research and clinical discussion.

Recommendations for Adults Younger Than 60 Years

Pharmacologic treatment for BP of 140/90 mm Hg or greater was recommended for adults younger than age 60 without diabetes or CKD (2). The DBP goal of less than 90 mmHg is well substantiated for patients aged 30 to 59 years. Strong evidence from six studies suggested decreased risk of fatal and nonfatal stroke when pharmacologic treatment was initiated at DBPs of 90 mm Hg and higher (4,5,6,15–20), and five studies demonstrated decreased cerebrovascular events after pharmacologic intervention to lower DBP below 90 mm Hg (15–18, 21). Insufficient evidence supported an association with risk of heart failure (18,21), coronary heart disease, and overall mortality (15,17,18,21) when DBP was below 90 mm Hg (4). Based on expert opinion, a DBP lower than 90 mm Hg was recommended for adults age 18 to 30 years; no relevant studies were identified. Similarly, the recommendation for pharmacologic intervention for adults younger than 60 years with SBPs of 140 mm Hg and higher was based on expert opinion due to insufficient evidence (4).

Recommendations for Patients With Diabetes

According to the new guidelines, pharmacologic intervention among patients with diabetes should begin at a BP of 140/90 mm Hg based on expert opinion (evidence comparing lower and higher BP targets in this population was insufficient). The Panel recognized the previously recommended SBP goal of 130 mm Hg but noted this goal is not supported by any RCT (2). Three studies that included patients with diabetes suggested that cardiovascular events, cerebrovascular events, and mortality
were reduced with a pharmacologic treatment target SBP of less than 150 mm Hg (22–24). In one study, treatment to lower the SBP to less than 120 mm Hg resulted in decreased cerebrovascular events compared to treatment that lowered SBP to less than 140 mm Hg, but there was no effect on cardiovascular events or overall mortality with the lower SBP (25). The Panel determined that this single study represented insufficient evidence to recommend a lower SBP goal because of inadequate statistical power due to a low event rate (2). Similarly, evidence was insufficient to recommend a DBP target of less than 90 mm Hg among patients with diabetes (2). One study found decreased nonfatal MI, stroke, and cardiovascular death in patients randomized to a DBP of less than 80 mm Hg compared to patients treated to a DBP of less than 90 mm Hg (25). Three trials suggested that mortality was nonsignificantly (two studies) or significantly (one study) reduced in patients treated to a DBP of less than 80 mm Hg compared to 90 mm Hg (24,26,27). The evidence from these studies was considered insufficient due to methodologic issues, such as small sample size, failure to specify diabetes diagnosis as a subanalysis at the beginning of the study, and a confounding effect of SBP on the effect of DBP (4).

Pharmacologic Recommendations
Pharmacologic therapy for adults was recommended based on race and diabetes status. The African American population without diabetes should be treated with a thiazide-type diuretic or CCB as first-line therapy, and the non-African American population without diabetes should be treated with a thiazide-type diuretic, CCB, ARB, or ACEI as initial therapy (2). For the non-African American population with diabetes, the recommendations were the same, based on the fact that patients with and without diabetes demonstrated similar cardiovascular and cerebrovascular outcomes when studied concurrently (2). The strength of the recommendation for the African American population with diabetes was even more limited because no trials comparing CCB and ACEI in this population were identified, and the recommendations were based on post hoc analysis of only one study (2,28). All of these pharmacologic recommendations were based only on RCTs that directly compared two classes of antihypertensive medications. Including placebo-controlled trials and analyses other than head-to-head comparisons could result in different suggestions for pharmacologic treatment of patients with diabetes (2). For example, a network analysis of 28 studies evaluating patients with hypertension and diabetes found ACEI to be the only class of drugs that prevented cardiovascular death, nonfatal MI, and nonfatal stroke compared with placebo in patients with diabetes (26). Given the strict inclusion criteria, the pharmacologic recommendations for patients with diabetes should be weighed against other relevant evidence and patient goals.

Limitations
Although commendable for attempting to make recommendations from quality evidence, the JNC 8 guidelines suffer from many limitations. Notably, they are not comprehensive and are limited in scope to the three guiding questions. There is very little comment on comorbidities related to hypertension, including diabetes. Furthermore, the exclusive use of RCTs excluded a substantial amount of data from systematic reviews, meta-analyses, and observational studies that often contradicted the data represented in the included RCTs. When RCT evidence was insufficient or only low-quality RCT evidence existed, recommendations were based on limited evidence and expert opinion. Finally, the Panel failed to reach unanimous conclusions for some recommendations, and the final publication does not represent all members of the Panel. A minority report presented the dissenting view of five Panel members with regard to the recommended SBP target of 150 mm Hg for adults older than 60 years of age (11). Due to these limitations, the JNC 8 guidelines have created controversy (11,13).

Commentary
Recommendations for Adults With Diabetes
The JNC 8 overlaps with the American Diabetes Association (ADA) 2014 Clinical Practice Guidelines with regard to lifestyle recommendations but diverge in the recommendations for target blood pressure and pharmacotherapy (Table 1).

The JNC 8 did not comment on lifestyle modification directly, instead endorsing the American College of Cardiology/American Heart Association (ACC/AHA) 2013 Lifestyle Work Group recommendations, which support a Dietary Approaches to Stop Hypertension (DASH) lifestyle approach that includes reduction in sodium intake by 1,000 mg/day (31). This recommendation is in line with the ADA, which calls for increased intake of foods lower in sodium and higher in potassium (32). Physical activity recommendations are also similar in the ACC/AHA 2013 Lifestyle Work Group recommendations and the 2014 ADA Clinical Practice Guidelines, although only the latter explicitly calls for regular resistance exercise (31,32).
Both the ADA and JNC 8 recognize that therapy with multiple drug classes is necessary for most patients to attain target blood pressure (2,32). However, the two guidelines differ in most other aspects of pharmacologic treatment recommendations (Table). The most striking difference between the ADA and the JNC 8 guidelines is the recommended target bP for patients with diabetes. Like the JNC 8, ADA recommends pharmacologic intervention at an sbP of 140 mm hg and greater, but it suggests a sbP target of less than 130 mm hg if treatment is well tolerated. A DbP of less than 80 mm hg is also recommended, leaving the total BP recommendations for patients with diabetes in the ADA guidelines much more restrictive than the JNC 8 target BP of 140/90 mm Hg or less (2,30).

Neither group’s recommendations on this topic are thoroughly evidence-based. JNC 8 found contradictory evidence that it deemed insufficient to recommend a BP less than 140/90 mm Hg, but ADA guidelines used evidence that did not meet the strict inclusion criteria of JNC 8, notably the ADVANCE trial (33). The JNC 7 guidelines are similar to the ADA guidelines, but a 2013 systematic review of four RCTs agrees with the JNC 8 recommendation (3,34). The target BP goal for patients with hypertension and diabetes is controversial, and more research is needed to clarify BP targets for adults with diabetes.

Recommendations for specific pharmacologic agents are different between JNC 8 and ADA guidelines. ADA guidelines recommend either an ACEI or an ARB whereas the JNC 8 guidelines recommend first-line use of ACEI, ARB, CCB, and thiazide-type diuretic in the non-African American population and thiazide-type diuretic or CCB in the African American population (2,32). Both guidelines acknowledge the evidence for improved cardiovascular outcomes with ACEI but interpret the findings differently. JNC 8, influenced by its strict inclusion criteria, found the evidence in support of ACEI insufficient to recommend its use instead of other drug classes (2,32). The ADA offers no recommendation for pharmacotherapy based on race.

Table 1. Summary of Recommendations in JNC 8, JNC 7, and ADA 2014 Clinical Practice Guidelines

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>JNC 8 (2)</th>
<th>JNC 7 (3)</th>
<th>ADA (30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBP in otherwise healthy adults ≥60 years of age</td>
<td>Initiate pharmacotherapy if SBP ≥150/90 mm Hg</td>
<td>Hypertension defined as SBP ≥140/90 mm Hg</td>
<td>N/A</td>
</tr>
<tr>
<td>BP in otherwise healthy adults 18 to 59 years of age</td>
<td>Initiate pharmacotherapy if BP ≥140/90 mm Hg</td>
<td>Hypertension defined as BP ≥140/90 mm Hg</td>
<td>N/A</td>
</tr>
<tr>
<td>BP in adults with diabetes</td>
<td>Initiate pharmacotherapy if BP ≥140/90 mm Hg</td>
<td>Target BP ≤130/80 mm Hg</td>
<td>Initiate pharmacotherapy if BP ≥140/80 mm Hg. Goal BP &lt;130/80 mm Hg. Initiate lifestyle modification if BP ≥120/80 mm Hg.</td>
</tr>
</tbody>
</table>

| First-line antihypertensive agents for adults with diabetes | Non-African American population: ACEI, thiazide-type diuretic, ARB, and CCB | African American Population: Thiazide-type diuretic, ACEI, ARB, CCB | ACEI or ARB; not race-specific |

ACEI=angiotensin-converting enzyme inhibitor; ARB=angiotensin receptor blocker; BP=blood pressure; CCB=calcium channel blocker; JNC=Joint National Committee; N/A=not available; SBP=systolic blood pressure

Recommendations for Adults Without Diabetes

The recommendation to increase the SBP target for adults older than 60 years is the component of the JNC 8 guidelines that has generated the most controversy. The minority report claims that increasing the SBP target will result in increased BP in older adults treated for hypertension...
and increase the number of people with untreated hypertension (11). The minority report considers the evidence supporting the benefit of a higher SBP goal insufficient to warrant increasing the SBP target and considers the evidence regarding adverse events in adults between 60 and 80 years of age suggestive that the target SBP of 140 mm Hg is safe in this population (11). Finally, the minority report considers observational and epidemiologic evidence of decreased strokes and cardiovascular events related to a target SBP of 140 mm Hg to support a lower SBP target (11).

Other recent recommendations agree with the view of the minority panel. An advisory from the AHA, ACC, and Centers for Disease Control and Prevention recommended a target BP of less than 140/90 mm Hg in adults older than 60 years (12). The American Society of Hypertension and the International Society of Hypertension issued a joint statement recommending a target SBP of 140 mm Hg for adults older than 60 years and the European Society of Hypertension also recommended this target (13,14). A common theme in each of these guidelines is that the evidence for changing the target SBP is not sufficiently strong to overrule the epidemiologic evidence of decreased uncontrolled hypertension and cardiovascular events correlated with a SBP target of 140 mm Hg. Furthermore, many adults older than 60 years tolerate treatment to an SBP of less than 140 mm Hg well, as alluded to even by the JNC 8 guidelines in the corollary statement to recommendation 1 (2). Each group has expressed concern that raising the BP threshold to 150/90 mm Hg for those 60 to 79 years would undo the progress made in stroke and CVD reduction over the past 30 years.

Clinical Implications
In light of the controversy surrounding the JNC 8 guidelines, the clinical implications of the guidelines vary, but RD, RDNs, and diabetes educators can take away some common themes. The pharmacologic recommendations will influence the costs of treatment and must be considered when caring for the holistic well-being of patients (Table 2). The JNC 8 guidelines also expose several gaps in the RCT literature and suggest future research priorities, particularly further investigation into an appropriate target BP for patients with diabetes and race-specific data for Hispanic, Asian, Aboriginal North American, and other populations. The higher SBP targets for adults older than 60 years and those with diabetes should affect practice most dramatically. Achieving these targets may be easier for patients and reduce polypharmacy, adverse effects, and

<table>
<thead>
<tr>
<th>Drug Class Cited By JNC 8</th>
<th>Example Drug(s)*</th>
<th>Common Dosing</th>
<th>Cost $ to $$$</th>
<th>Rationale for use as first-line therapy (2)</th>
<th>Black population</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE-inhibitors:</td>
<td>Lisinopril</td>
<td>10 to 40 mg daily</td>
<td>$</td>
<td>ACEI more effective than CCB in improving heart failure outcomes</td>
<td>Compared to CCB, higher rate of stroke and less effective at lowering BP</td>
</tr>
<tr>
<td></td>
<td>Captopril</td>
<td>Variable</td>
<td>$$$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiazide-like Diuretics:</td>
<td>Hydrochlorothiazide</td>
<td>12.5 to 25 mg daily</td>
<td>$</td>
<td>More effective than CCB and ACEI at improving heart failure outcomes</td>
<td>More effective at improving cerebrovascular, heart failure and combined cardiovascular outcomes</td>
</tr>
<tr>
<td></td>
<td>Chlorothalidone</td>
<td>25 mg daily</td>
<td>$$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARBs:</td>
<td>Losartan</td>
<td>25 to 100 mg daily</td>
<td>$</td>
<td>Comparable to thiazide diuretic, ACEI and ARB.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Valsartan</td>
<td>80 to 320 mg daily</td>
<td>$$$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCB:</td>
<td>Amlodipine</td>
<td>5 to 10 mg daily</td>
<td>$</td>
<td>Compared to thiazide-type diuretic and ACEI, less effective at improving heart failure outcomes</td>
<td>Compared to ACEI, lower risk of stroke, more effective at reducing BP</td>
</tr>
</tbody>
</table>

*Each example drug was used to generate evidence in the JNC 8 but other drugs also contributed to the evidence-base for each drug class.
costs. On the other hand, a higher SBP target may lead to an increase in uncontrolled hypertension, strokes, cardiovascular morbidity, and mortality. The JNC 8 guidelines are commendable for their adherence to the principles of evidence-based medicine, but in light of the multiple contradictory guidelines and the as yet unknown effects of increased SBP targets, they are far from authoritative. Rather, they highlight the need for clinical judgment when considering patient goals, best evidence, and the holistic health of the patient.

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Check out the CVD webinar on the DCE website that was offered in July – Role of Healthy Fats in the Prevention and Treatment of Heart Disease and Diabetes.
The 2013 American Diabetes Association Nutrition Therapy Recommendations: Welcome Changes!

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Introduction
How These Recommendations Can Influence Practice

As a registered dietitian (RD) and diabetes educator (CDE) who has worked in the field for many years, I am pleased to see that the 2013 American Diabetes Association (ADA) nutrition therapy recommendations (1) confirm and support the practice behaviors I’ve always endorsed: promoting a patient-centered approach, using a variety of meal planning tools, and basing clinical decisions on scientific evidence and experienced clinical judgment. Perhaps these welcome changes finally have resulted from a writing group composed of primarily RD, CDEs.

My hope is that these recommendations will influence a change in the practice of other “frontline” health care professionals, such as generalist RDs and registered dietitian nutritionists, health educators, community health workers, office practice nurses, and family/internal medicine physicians. These professionals frequently make the initial patient contact, especially at the time of diagnosis. Unfortunately, they often dispense advice, provide general information, set unrealistic goals, and/or use a “one-size-fits-all” eating plan (e.g., eat less, exercise more, lose weight, 1,200/1,500 kcal restricted diet sheets). The 2013 ADA recommendations provide important messages for people with diabetes who are often not referred to or do not have access to a diabetes educator. Specifically, the emphasis on individualization, flexibility, and use of a variety of meal planning tools to teach healthy eating is especially important.

Primary Goals for Nutrition Therapy in Diabetes in 2013

The ADA endorses the integral role of nutrition therapy in diabetes management, including the collaborative development of an individualized eating plan. The stated goals of nutrition therapy for adults with diabetes are to (1):

• Promote and support healthy eating patterns, emphasizing a variety of nutrient-dense foods in appropriate portion sizes
• Address individual nutrition needs based on personal and cultural preferences, health literacy and numeracy, access to healthful food choices, willingness and ability to make behavioral changes, and barriers to change
• Maintain the pleasure of eating by providing positive messages about food choices while limiting food choices only when indicated by scientific evidence
• Provide practical tools to the individual with diabetes for day-to-day meal planning rather than focusing on individual macronutrients, micronutrients, or single foods

These goals can improve overall health and help to achieve the following clinical outcomes (1):

• Attain individualized glycemic, blood pressure, and lipid goals:
  – Glycated hemoglobin <7%
  – Blood pressure <140/80 mm Hg
  – Low-density lipoprotein cholesterol <100 mg/dL
  – Triglycerides <150 mg/dL
  – High-density lipoprotein cholesterol >40 mg/dL for men and >50 mg/dL for women
• Attain and maintain body weight goals
• Delay or prevent complications of diabetes

New Aspects of the Recommendations

The 2013 ADA recommendations are specific to adults who have been diagnosed with type 1 or type 2 diabetes. The recommendations do not address nutrition therapy for the prevention of either type 2 diabetes or gestational diabetes or the management of diabetes complications.

The new recommendations place much more emphasis on the pleasure of eating through positive messaging about food and only limiting food choices when indicated.
by scientific evidence. Rather than focusing on specific amounts of macronutrients, the recommendations support limiting calories through appropriate portion sizes and emphasize consumption of a variety of nutrient-dense foods rather than concentrating on single foods.

Most noteworthy, the recommendations promote the use of a variety of eating patterns and practical tools for meal planning to allow for individualization and flexibility. This contrasts with the current practices of many frontline providers, as described previously.

Table 1 provides a summary of the key points in the 2013 ADA nutrition recommendations.

### Intersection of the 2013 ADA Recommendations With the 2013 Cardiovascular Disease (CVD) Prevention Guidelines

The 2013 CVD prevention guidelines (2) emphasize lifestyle modification as the critical component of health promotion and cardiovascular risk reduction, both with and without the use of cholesterol-lowering drug therapies. Lifestyle modification is defined as adhering to a heart healthy diet, regular exercise habits, avoidance of tobacco products, and maintenance of a healthy weight. A heart healthy diet is defined as an eating pattern that emphasizes fruits, vegetables, whole grains, low-fat dairy products, poultry, fish, and nuts, with a limit on consumption of red meat and sugary foods and beverages. To lower blood pressure, the guidelines also emphasize limiting sodium intake. A step-down approach for decreasing the amount of sodium is recommended, with a limit of no more than 2,400 mg/day and gradually decreasing sodium intake to a more desirable level of 1,500 mg/day. To lower cholesterol, the guidelines recommend reducing saturated fat to no more than 5% to 6% of total calories and to avoid trans fats. Following a heart healthy eating pattern can ensure staying within these recommended levels of sodium and saturated and trans fat without the need to keep track of specific amounts (2).

The ADA nutrition and CVD prevention guidelines intersect primarily in their recommendations for eating patterns to promote healthy eating, their micronutrient and macronutrient guidelines for sodium and fat to lower blood pressure and reduce the risk of CVD, and their obesity guidelines that address energy balance and weight loss intervention. Table 2 compares and contrasts the nutrition and obesity guidelines from the ADA and the American College of Cardiology (ACC)/American Heart Association (AHA) for 2013.

### Practical Issues

Two primary goals in the 2013 ADA nutrition recommendations are to promote and support a variety of healthful eating patterns and to use practical tools for day-to-day meal planning. Eating patterns are defined as combinations of different foods or food groups. Several eating patterns are reviewed as acceptable in the management of diabetes: Mediterranean style, vegetarian and vegan, low fat, low carbohydrate, and Dietary Approaches to Stop Hypertension (DASH). The Dietary Guidelines for Americans is another type of commonly used eating pattern, but because it has not been investigated in many of the research studies for persons with diabetes, it was not included in the reviews. Personal preferences such as tradition, culture, religion, health beliefs, economics, and metabolic goals should also be considered when recommending a specific eating pattern. As was summarized in the ADA nutrition recommendations, “there are several eating patterns that may lead to improvements in glycemic and/or CVD risk factors; there is no ‘ideal’ eating pattern that is expected to benefit all persons with diabetes” (1,3).

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### Table 1. 2013 Nutrition Recommendations: Key Points

- A position statement contains a systematic review of 246 published research citations, employing an evidence-based grading system in the evaluation and development of guidelines
- Emphasis on individualization and no “one-size-fits-all” approach; multiple meal planning approaches and eating patterns can be effective in achieving metabolic goals
- Positive messaging about the pleasure of eating
- Strong recommendation to limit highly processed, low-nutrient density foods, including sugar-sweetened beverages
- Use of portion size as an important strategy for weight loss and maintenance
- Focus on the amount of carbohydrate-containing foods and beverages as the most important factor in determining glycemic response after eating
- Priority given to coordinating food with the type of diabetes medication (antihyperglycemic oral agents and all injectables, including insulin)
Some practitioners might ask, “What’s the difference between an eating pattern and a meal plan?” Several meal planning approaches have been endorsed by and educational resources developed by both the Academy of Nutrition and Dietetics and the ADA for persons with diabetes, such as carbohydrate counting, exchange lists, healthy food choices, plate method, and menus.

A helpful approach is to think of an eating pattern as WHAT TYPE of food or food group. A meal plan provides more specific information about HOW MUCH to eat. The tools for meal planning are the educational resources used by the practitioner to assist persons with diabetes in individualizing the meal plan. For example, the DASH eating pattern emphasizes fruits, vegetables, low-fat dairy products, whole grains, poultry, fish, and nuts and reduced intake of red meats, sweets, sugary beverages, and sodium. A DASH eating plan is more specific, with a prescribed calorie count and numbers of daily servings from each food group. A 2,000-kcal DASH eating plan provides 6 to 8 servings of whole grains; 4 to 5 servings of vegetables; 4 to 5 servings of fruits; 2 to 3 servings of fat-free or low-fat milk and milk products; 6 or less ounces of lean meats, poultry, and fish; 4 to 5 servings/wk of nuts, seeds, and legumes; 2 to 3 servings/day of heart healthy fats and oils; and 5 or less servings/wk of sweets and added sugars. An educational resource that can be used to teach the DASH eating plan is available online and included in the Education Resources section at the end of this article.

Meal plans can be either “basic” (suggested portion sizes or numbers of servings of foods or food groups) or “in-depth” (specific calorie counts, carbohydrate choices, or grams of carbohydrate and/or fat). When selecting a meal plan, the practitioner must take into account the chronicity of diabetes and the likelihood that a combination of meal plans or approaches may be needed over time. Ideally, nutrition education and counseling should be conducted in stages. The standard that should be applied to all nutrition intervention is to base it on a comprehensive nutrition assessment and establish individualized goals for everyone with diabetes.

References


Educational Resources

Basic Meal Planning

PLATE METHOD

HEALTHY FOOD CHOICES

MEDITERRANEAN

VEGETARIAN/VEGAN
• The Power Plate. Physicians Committee for Responsible Medicine. Access online at www.thepowerplate.org

DASH

In-Depth Meal Planning

CARBOHYDRATE, FAT, CALORIE COUNTING RESOURCES
• Count Your Carbs: Getting Started
• Match Your Insulin to Your Carbs

Order from The Academy of Nutrition and Dietetics at www.eatrightstore.org OR the American Diabetes Association at www.store.diabetes.org


Exchange List Resources

The listed resources are just a few of the many that are available, specifically from the Academy of Nutrition and Dietetics and the American Diabetes Association. Several other organizations and websites have education materials that can be used for persons with diabetes:
• International Diabetes Center (www.IDCPublishing.org)
• Joslin Diabetes Center (www.joslin.org)
• National Diabetes Education Program (www.ndep.nih.gov)
• Many pharmaceutical companies also have free nutrition education materials for persons with diabetes

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Question: What have been the biggest challenges you’ve faced in implementing the long-awaited atherosclerotic cardiovascular disease (ASCVD) guidelines?

**Dr. Taylor:** It is difficult for patients and practitioners to practice without low-density lipoprotein cholesterol (LDL-C) targets. For years, LDL-C goals have given patients and practitioners a sense of security that treatment is effective and appropriately lowering risk. Additionally, I think practitioners find it challenging to implement guidelines that many experts do not endorse. Furthermore, when patients hear of the controversy in the media, they are skeptical of the validity of the new guidelines.

**Dr. McCall:** The biggest challenges have been explaining the new guidelines and how they differ from the old guidelines. Patients do not easily understand the difference and want to know why the guidelines are changing. Additionally, I think practitioners find it challenging to implement guidelines that many experts do not endorse. Further, when patients hear of the controversy in the media, they are skeptical of the validity of the new guidelines.

**Dr. McCall:** The biggest challenges have been explaining the new guidelines and how they differ from the old guidelines. Patients do not easily understand the difference and want to know why the guidelines are changing. Additionally, I think practitioners find it challenging to implement guidelines that many experts do not endorse. Further, when patients hear of the controversy in the media, they are skeptical of the validity of the new guidelines.

Question: Little evidence in the guidelines recommended the use of non-statin therapies to reduce ASCVD risk. Do you still use these therapies and if so, when?

**Dr. Taylor:** It is important to recognize that these guidelines do not apply to complex lipid abnormalities. I absolutely use non-statin therapies in these situations.

**Dr. McCall:** As Dr. Taylor indicated, we see people for complex dyslipidemias and the guidelines do not apply to them. I still use non-statin therapies, probably less niacin, but both omega-3 fatty acids and fenofibrates, to control high triglycerides and low high-density lipoprotein cholesterol.

Question: The expert panel recommended statin therapy as primary prevention for individuals 40 to 75 years of age with diabetes and LDL-C values of 70 to 189 mg/dL. This places type 1 and type 2 diabetes in the same risk group. Do you treat cardiometabolic risks differently for individuals with type 1 and type 2 diabetes?

**Dr. Taylor:** The risk of cardiovascular disease in the presence of insulin resistance and type 2 diabetes actually begins long before the onset of frank diabetes and hyperglycemia, which differentiates type 1 and type 2 diabetes. Inflammatory processes that contribute to cardiovascular disease risk in type 2 diabetes occur along a continuum that begins in the phase we now call prediabetes, a phenomenon that has been demonstrated in numerous clinical trials. Thus, application of the guidelines may be more critical at an earlier stage of type 2 diabetes. Studies have also demonstrated that type 2 diabetes is a cardiovascular disease equivalent, and in my opinion, all patients with type 2 diabetes should be prescribed a statin regardless of their LDL-C values because statins are potent anti-inflammatory agents and reduce cardiovascular risk.

**Dr. McCall:** Debates at this year’s American Diabetes Association (ADA) and Endocrine Society meetings stressed that all of the data in the
guidelines are really for type 2 diabetes. There are no significant data about statin use in type 1 diabetes, and it is not clear whether affected patients should be treated differently. Both type 1 and type 2 diabetes are known to increase cardiovascular risk. The risk associated with type 1 diabetes largely is related to long duration of disease and the presence of proteinuria. In fact, type 1 and type 2 diabetes are treated the same, but there are virtually no outcome data with statin trials in type 1 diabetes. The etiology may well be different in type 1 diabetes, which was also mentioned in the ADA debates. I use statins in both groups of patients, but I don’t think we have enough data about type 1 diabetes. Dr. Henry Ginsberg, in his discussion with Dr. Robert Eckel, acknowledged that the data on statin needs in type 1 diabetes simply do not exist and, therefore, we are basing analogous treatment on what is known with type 2 diabetes. Much more investigation is needed to understand the best strategies for type 1 diabetes. Some even have argued that the treatment recommended for type 2 diabetes (especially among those with metabolic syndrome risks) is less aggressive than that recommended for primary prevention. No distinction is made for either renal disease or proteinuria, which have an enormous influence on cardiovascular risk. One point that Dr. Eckel mentioned and that the guidelines state is not to treat those on dialysis or those who have New York Heart Association Class II through IV heart failure because there is no proven benefit of statins for these patients. Dr. Eckel recommended cessation of statin therapy for those on dialysis because the benefit is unproven.

Question: The risk calculator generated substantial controversy, but since its release, REGARDS analysis showed that the risk calculator performed well. Do you have concerns about the current risk calculator and have you used it in clinical practice?

Dr. Taylor: I have rarely used the risk calculator. Most statin trials have used the Framingham risk calculator to determine cardiovascular risk. The new risk calculator has never been used in a large statin trial and, thus, has little proven validity. The new guidelines are very particular about using only robust clinical trial data to make recommendations, yet the calculator they recommend has never been studied in a large clinical trial. That is a bit perplexing.

Dr. Mccall: I do use the risk calculator and show the results to my patients, but I believe the risk estimation remains potentially problematic for some groups of patients who have not been studied. I appreciate that one of its benefits is the ability to discuss specific groups, both male and female and African American and Caucasian, but many other groups have not been evaluated, such as individuals with type 1 diabetes, Latinos, and many Asian ethnicities. I believe concern remains about the lower level of cut off (7.5% 10-year risk), and I am uncertain whether the calculator is really validated fully if the articles that are critical of the predictions (e.g., Ridker PM, Cook NR. Statins: new American guidelines for prevention of cardiovascular disease. Lancet 2013;382:1762-1765) are correct in suggesting overestimates of 75% to 150%. Another issue is whether we should treat people who have a 5% to 7.5% risk. I do like that we can show younger patients their lifetime risk.

Question: Many clinicians still use biomarkers as an indicator of risk. The guidelines reviewed nine of the new biomarkers. The recommendation was that once risk is calculated, additional markers can provide quantitative risk assessment (family history of premature cardiovascular disease, coronary calcium score >75% for age or >300 Agatston units, C-reactive protein (CRP) >2, or low ankle brachial index <0.9). How and when would you use additional information to help with risk assessment? Further, in what situations do you use vertical auto profile (VAP) and apolipoprotein B?

Dr. Taylor: I use additional biomarkers of risk in two situations: 1) When I am on the fence about starting statin therapy and need additional information to better define individual patient risk and 2) When I feel a patient is at high risk and the patient does not want to start a statin. Additional information may be persuasive enough to convince the patient of the need for a statin. I generally perform an initial VAP in all of my patients to help define hidden genetically determined risk. If there are no abnormalities on the VAP that necessitate specific therapy, I continue follow-up using a standard lipid panel.

Dr. McCall: The additional information helps to assign those of potentially intermediate risk to higher or low aggregate risk scores and, thus, individualize the risk estimate. Clinicians can use them on a case-by-case basis. Use of one or several of these markers can help if the direction for action is not clear when somebody has an intermediate risk. Sometimes I use a CRP or carotid intimal medial thickness as additional markers, and I pay a lot of attention to family history, which is a powerful indicator of risk. The use of lifetime risk is also important because I worry about more than the short-term risk in younger individuals.
Question: Another area of considerable confusion has been the blood pressure targets and dissenting opinions about targets for age as well as optimal therapies based on race. Given this level of disagreement, how are you treating hypertension in your practice, and have the JNC 8 guidelines changed your treatment or targets?

**Dr. Taylor:** I remain very aggressive with blood pressure control in younger patients. However, I think the guidelines give practitioners a little more freedom in elderly people where it is likely more warranted. Unfortunately, practitioners are forced to meet guideline recommendations or be penalized. I believe our management of elderly patients has often been too aggressive in certain situations just to meet guidelines. The new guidelines allow room for the art of medicine. A clinician may wish to be less aggressive in an 80-year-old man with a blood pressure of 150/80 mm Hg and long-standing hypertension than in a 25-year-old man with the same blood pressure. We must be careful not to generalize guidelines to everyone. Medicine does still require much thought.

**Dr. McCall:** The biggest issue is the decision for people 60 years and older to have a target of 150 mm Hg systolic blood pressure. I don’t routinely adhere to that recommendation, but I do pay attention to patients who have large pulse pressures and who have very low diastolic pressures and high systolic pressures. In those individuals, one must be extremely careful in advancing blood pressure drug therapy, sometimes settling for a higher systolic pressure. An across-the-board systolic blood pressure target of less than 150 mm Hg, irrespective of the diastolic pressure and the target organ damage, seems inappropriate to me. We may not treat some people as aggressively when the systolic blood pressure is less than 140 mm Hg. In addition, some patients with diabetes deserve more aggressive treatment, especially when they have proteinuria. Lower than 140/90 mm Hg is not the only goal for some high-risk patients because you can do better as long as they tolerate the therapy (based on the ACCORD trial). Tolerating the therapy without acute kidney problems, electrolyte problems, or presyncopal problems is the key. I want to try to individualize goals based on risks and adverse effects of therapy.

**Question:** Lifestyle is a priority in each of the guidelines, but this factor seems to have been lost in some of the other debate. How much of your time in clinical practice is devoted to discussing and negotiating lifestyle strategies?

**Dr. Taylor:** I believe that lifestyle should be at the forefront of the discussion. Most of the medical issues discussed in the guidelines can be controlled with lifestyle modification. While medications are critical to lowering risk, they should be an adjunct to a healthy lifestyle program. Too often we rely on a pill to fix what can be cured by what we eat and how much we walk.

**Dr. McCall:** Lifestyle modification is always a high priority for me, as is identifying people who are susceptible to making change in lifestyle. First I try to do motivational interviewing to assess susceptibility to change. If I see a willingness to change, I spend a considerable amount of time working on this. I also work on lifestyle changes with those who object to the number of medicines they’re taking. I emphasize that if they want to be on fewer medicines, they should focus on lifestyle changes. Lifestyle changes may help virtually every aspect of ASCVD risk (blood pressure, diabetes, sedentary behavior). I also recognize that I have the luxury of time and a staff to help me with this type of issue, which is not common to all practitioners.

### Important Terms

- **Vertical Auto Profile:** Measurement of cholesterol concentrations of five lipoprotein classes.
- **C-reactive protein:** A nonspecific test that detects inflammation.
- **Ankle brachial Index:** A test to screen for peripheral arterial disease.
- **Apolipoprotein B:** A true indicator of the number of circulating atherogenic non-high-density lipoprotein-cholesterol particles and an accurate measurement of the relative number of particles.
- **Agatston units:** Method of calcium scoring related to coronary plaque.

Canola oil can help control blood glucose and improve blood cholesterol in people with type 2 diabetes when included as part of a low-glycemic index diet, according to research published in the July 2014 American Diabetes Association journal Diabetes Care. The study of 141 Canadian adults with type 2 diabetes showed that adding canola oil to the diet is a simple way of helping control blood glucose and risk of cardiovascular disease. Participants at increased risk for adverse effects from type 2 diabetes, such as those with high blood pressure, derived the greatest benefits. Learn more from DiabetesCare.net blogger Amy Hess-Fischl, MS, RD, CDE.
By CanolaInfo

As a diettian, you probably know canola oil is healthy and versatile, but perhaps not exactly why.

Canola oil is lauded for both what it *does* contain and what it *doesn’t*. Of all common cooking oils, it has the most plant-based omega-3 fat (11 percent) and the least saturated fat (7 percent) – half that of olive oil (15 percent). Canola oil is also free of trans fat, which the U.S. Food and Drug Administration (FDA) preliminarily ruled unsafe in 2013.

Heart-Smart Fat

“Since heart disease is the leading cause of death in the United States, it’s critical to keep intake of saturated fat to 6-10 percent of total daily calories, depending on one’s risk of heart disease, and to consume a moderate amount of healthy unsaturated fats instead,” says Dr. Suzanne Steinbaum, cardiologist and director of the women’s heart disease center at New York’s Lenox Hill Hospital. “Canola oil is simply a smart choice as an everyday cooking oil.”

In fact, the FDA authorized a qualified health claim* on canola oil’s ability to reduce the risk of heart disease when used in place of saturated fat.¹ Research has shown that the oil’s high unsaturated fat content (93 percent) helps lower LDL cholesterol, thereby reducing the risk of cardiovascular disease.² The unsaturated fats are made up of monounsaturated fat (61 percent) and polyunsaturated fats (32 percent). The latter category is comprised of alpha-linolenic acid, an omega-3 fat, and linoleic acid, an omega-6 fat.

“The types of omega-3 and omega-6 fats that are found in canola oil can be considered ‘essential’ in the diet because the body can’t make them on its own,” notes Roberta Duyff, M.S., R.D.N., author of the American Dietetic Association Complete Food and Nutrition Guide. “Canola oil is higher in the omega-3 alpha-linolenic acid than other common cooking oils so it’s an easy way to get some of this often underconsumed fat in the diet.”

A Plant All Its Own

Canola oil comes from the crushed seeds of the canola plant, which a member of the Brassica family that includes broccoli, cabbage and cauliflower. It was developed in Canada through traditional plant breeding to remove two undesirable components (erucic acid and glucosinolates) found in rapeseed. To acknowledge these differences, the new plant earned a new name, canola – a contraction of “Canadian” and “ola” meaning “oil.”

“Canola is often confused with rapeseed, but the two crops and their oils are distinctly different,” says Minnesota canola grower Rob Rynning.

Indeed, there is an internationally regulated definition of canola that differentiates it from rapeseed based upon it having less than 2 percent erucic acid and less than 30 micromoles of glucosinolates (a bitter-tasting organic compound). Oils that do not meet this standard cannot use the term “canola.”

Rapeseed, although still grown in limited quantities in North America, is now confined to production under contract for specific industrial uses, Rynning notes.

Go-to Ingredient

Moreover, chefs consider canola oil a kitchen essential, too. Its neutral flavor, light texture and high heat tolerance (smoke point of 468 °F) make it a match for almost any culinary application.

“I love cooking with canola oil because it’s incredibly versatile,” agrees Nancy Hughes, a professional recipe developer and cookbook author. “I can use it for sautéing, searing, roasting, baking, stir-frying, vinaigrettes – you name it. The fact that it’s healthy to boot makes my decision in the kitchen even easier.”

*Limited and not conclusive scientific evidence suggests that eating about 1½ tablespoons (19 grams) of canola oil daily may reduce the risk of coronary heart disease due to the unsaturated fat content in canola oil. To achieve this possible benefit, canola oil is to replace a similar amount of saturated fat and not increase the total number of calories you eat in a day.

References:

CanolaInfo is the information source about canola oil for consumers, health professionals, chefs, media, educators—anyone who wants to know more about this oil.
Dietetic Registration (cDR). cPe Dietetics.

Dce/Academy of Nutrition and submitted, and recorded by is successfully completed, valid when the cPe questionnaire the certificate of completion in the event you are audited by cDR.

Please record 3.0 hours on your learning Activities log and retain the certificate of completion in the event you are audited by cDR. The certificate of completion is valid when the CPE questionnaire is successfully completed, submitted, and recorded by DCE/Academy of Nutrition and Dietetics.

CPE Credit Self-Assessment Questionnaire

Select the one best answer for each question below.

1) The new ACC/AHA cholesterol treatment guidelines focus on:
   a. Lowering the risk of stroke and heart disease
   b. Revising LDL targets
   c. Identification of bio-markers to treat risk
   d. Increasing levels of HDL

2) According to the ACC/AHA treatment guidelines, which statin treatment would be recommended for a 47 y/o white male with T2DM, LDL of 142 mg/dl and a 10 year calculated risk score of 8%?
   a. High intensity
   b. Moderate intensity
   c. Low intensity
   d. No statin is recommended

3) Which of the following is true in regard to the 2013 ADA Nutrition therapy recommendations?
   a. Nutrition therapy for diabetes prevention is included
   b. Macronutrient pattern recommendation has changed to 45% carb, 35% fat, and 20% protein
   c. Variety of eating patterns are recommended to allow for individualization and flexibility
   d. Specific calorie deficits are recommended for weight loss.

4) Which of the following is NOT included in the ACC/AHA Lifestyle recommendations to reduce cardiovascular risk?
   a. Saturated fat between 5-6% of calories
   b. Dietary intake of cholesterol should be less than 200 mg
   c. 40 minutes of physical activity 3-4 times per week
   d. Aiming for less sodium in the diet with greater reductions in BP seen with <1500 mg daily

5) Under which of the following situations might non-statin therapies be used to treat risk according to Drs. McCall and Taylor?
   a. Patients with complex lipid disorders
   b. Patients with hypothyroidism
   c. Patients unable to tolerate high dose statins
   d. Patients who have Lp(a) greater than 20 mg

6) Historically, the National Heart, Lung, and Blood Institute (NHLBI) has been supporting the development of clinical practice guidelines for which three modify risk factors in the adult population?
   a. High blood cholesterol, high blood pressure, and overweight/obese
   b. Diabetes, high blood cholesterol, and high blood pressure
   c. High blood cholesterol, kidney diseases, and high blood pressure
   d. Diabetes, high blood cholesterol, and overweight/obese

7) In A summary of the Systematic Evidence Review from the Obesity Expert Panel, what were some of the criteria used to rate the quality of the study?
   a. Overall drop-out rate
   b. Adequate randomization
   c. Group similarity at baseline
   d. All of the above

8) Based on A summary of the Systematic Evidence Review from the Obesity Expert Panel's article, select the correct statement:
   a. The 2013 guideline focused recommendations on seven specific critical questions
   b. The 2013 overweight and obesity expert panel suggested individualized weight loss programs
   c. Clinicians should not consider overweight and obesity as a chronic metabolic disorder associated with significant morbidity and mortality
   d. The evidence statement “six months or more of lifestyle counseling produces the most successful outcomes" was graded as low

9) In 2014 Evidence-based Guideline for the Management of High Blood Pressure in Adults: Summary and Clinical Implications, the report from the Panel Members Appointed to the Eighth Joint National Committee (JNC 8) did the following:
   a. Agreed with the definition of the terms “hypertension” and “prehypertension”
   b. Suggested ten recommendations for managing high blood pressure in adults
   c. Offered new strategies for treating hypertension
   d. Focused on five guiding questions

10) The recommendations proposed by the Panel Members Appointed to the Eighth Joint National Committee (JNC 8) were based on:
   a. Randomized clinical trials
   b. Trials with a sample size of more than 100 participants
   c. Trials that were conducted between January 1966 and August 2013
   d. All of the above
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