

# Circulation

## AHA SCIENCE ADVISORY

# Strategies for Promotion of a Healthy Lifestyle in Clinical Settings: Pillars of Ideal Cardiovascular Health

A Science Advisory From the American Heart Association

Penny M. Kris-Etherton, PhD, RD, FAHA, Chair\*; Kristina S. Petersen, PhD, FAHA, Vice Chair\*; Jean-Pierre Després, PhD, FAHA, Vice Chair; Cheryl A.M. Anderson, PhD, MPH, FAHA; Prakash Deedwania, MD, FAHA; Karen L. Furie, MD, FAHA; Scott Lear, PhD, FAHA; Alice H. Lichtenstein, DSc, FAHA; Felipe Lobelo, MD, PhD, FAHA; Pamela B. Morris, MD, FAHA; Frank M. Sacks, MD, FAHA; Jun Ma, MD, PhD, FAHA; on behalf of the American Heart Association Council on Lifestyle and Cardiometabolic Health; Council on Cardiovascular and Stroke Nursing; Stroke Council; Council on Clinical Cardiology; Council on Arteriosclerosis, Thrombosis and Vascular Biology; and Council on Hypertension

**ABSTRACT:** Engagement in healthy lifestyle behaviors is suboptimal. The vast majority of the US population does not meet current recommendations. A healthy lifestyle is defined by consuming a healthy dietary pattern, engaging in regular physical activity, avoiding exposure to tobacco products, habitually attaining adequate amounts of sleep, and managing stress levels. For all these health behaviors there are well-established guidelines; however, promotion in clinical settings can be challenging. It is critical to overcome these challenges because greater promotion of healthy lifestyle practices in clinical settings effectively motivates and initiates patient behavior change. The 5A Model (assess, advise, agree, assist, and arrange) was developed to provide a framework for clinical counseling with requisite attention to the demands of clinical settings. In this science advisory, we present strategies, based on the 5A Model, that clinicians and other health care professionals can use for efficient lifestyle-related behavior change counseling in patients at all levels of cardiovascular disease risk at every visit. In addition, we discuss the underlying role of psychological health and well-being in lifestyle-related behavior change counseling, and how clinicians can leverage health technologies when providing brief patient-centered counseling. Greater attention to healthy lifestyle behaviors during routine clinician visits will contribute to promoting cardiovascular health.

**Key Words:** AHA Scientific Statements ■ cardiovascular diseases ■ counseling ■ diet, healthy ■ exercise ■ health behavior ■ life style  
■ smoking cessation

**C**ardiovascular disease (CVD) is the leading cause of death.<sup>1</sup> At the foundation of primordial, primary, and secondary CVD prevention is a healthy lifestyle throughout the life span.<sup>2</sup> A healthy lifestyle is defined by consuming a healthy dietary pattern, engaging in regular physical activity, avoiding exposure to tobacco products, attaining adequate amounts of sleep, and managing stress levels. For each of these lifestyle factors, there are evidence-based guidelines; however, promotion in clinical settings can be challenging. This science advisory presents strategies that clinicians and other health care professionals can use for lifestyle-related behavior change counseling of patients at all levels of CVD risk by using the 5A Model.

The 5A Model (assess, advise, agree, assist, and arrange) is identified as a unifying framework for behavioral counseling in primary care by the US Preventive Services Task Force (USPSTF).<sup>3</sup> In addition, the Centers for Medicare & Medicaid Services state that behavioral counseling interventions to promote a healthy diet should be consistent with the 5A Model; for Medicare beneficiaries, 1 face-to-face CVD risk reduction visit per year is covered.<sup>4</sup> The 5A Model was originally developed for smoking cessation; however, it has been effectively adapted for a number of different health behaviors (eg, healthy eating and physical activity)<sup>5</sup> and health conditions (eg, hypertension and obesity).<sup>6–8</sup> Given the

\*P.M. Kris-Etherton and K.S. Petersen contributed equally and are co-first authors.

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well-described gaps in behavioral science, including lifestyle counseling in medical education and training,<sup>9,10</sup> this science advisory aims to be a practical resource and education tool to build clinician knowledge, confidence, and competence in providing lifestyle-related behavior change counseling.

In 2010, the concept of ideal cardiovascular health was coined by the American Heart Association and is defined as the absence of clinically manifest CVD and optimal levels of 4 health behaviors (smoking, physical activity, healthy diet, and a healthy body weight, a proxy for energy balance) and 3 CVD risk factors (blood glucose, total cholesterol, and blood pressure).<sup>11</sup> Substantial and concordant evidence supports the CVD benefits of these health behaviors for primordial, primary, and secondary prevention; this evidence has been summarized in previous AHA scientific statements<sup>12–17</sup> and guidelines documents.<sup>2,18</sup>

In brief, prospective cohort studies show that greater adherence to healthy lifestyle behaviors, consistent with the ideal cardiovascular health definition, is associated with significantly lower risk of CVD and increased life expectancy.<sup>19,20</sup> Ideal cardiovascular health was the metric by which progress toward the AHA's 2020 Impact Goal of improving the cardiovascular health of Americans by 20% was measured.<sup>11</sup> Although some progress was made in the past decade, only 0.1% of adults ≥20 years of age have ideal health behaviors defined as meeting recommendations for physical activity, diet, body mass index, and nonsmoking.<sup>1</sup> Continued efforts to improve cardiovascular health behaviors in all population groups are needed with concomitant emphasis on well-being, which encompasses psychological health and additional aspects of security, prosperity, sense of connection, and purpose.<sup>21</sup> Cardiovascular health behaviors and well-being are bidirectionally linked, and therefore, dual consideration is needed to lower CVD risk.

Modification of health behaviors is complex and requires intervention at the individual, community, health care system, and policy levels.<sup>22,23</sup> However, part of the solution is greater promotion of healthy lifestyle practices by clinicians.<sup>24</sup> In this science advisory, the term clinician refers to health care professionals qualified in the clinical practice of medicine and includes physicians, nurses, pharmacists, and other allied health professionals; however, we have retained the terminology used by cited sources that describe a particular clinician (eg, physician).

Accumulating evidence shows that clinicians are well positioned to influence the lifestyle practices of their patients.<sup>25,26</sup> The USPSTF concluded with moderate certainty that primary care interventions to promote a healthful diet, physical activity, or both result in improvements in health behaviors and lower CVD risk in patients with and without cardiovascular risk factors.<sup>25,26</sup> Furthermore, the USPSTF recommends (level of evidence grade

A) that clinicians ask all adults about tobacco product use, advise them to stop using tobacco products, and provide behavioral interventions and US Food and Drug Administration-approved pharmacotherapy for cessation to adults who use tobacco.<sup>27</sup> Despite these recommendations, findings from the National Ambulatory Medical Care Survey and Centers for Disease Control and Prevention/National Center for Health Statistics show that, in 2016, only 13.4% of physician visits made by children or adults included counseling about nutrition or diet; this is an increase from 7.9% in 2012.<sup>28</sup> Similarly, only 5.3% of physician office visits made by children and adults included counseling related to physical activity, and 7.7% of physician visits made by patients with a diagnosis of CVD, diabetes, or hyperlipidemia included counseling related to physical activity.<sup>29</sup> Higher rates of physician intervention for smoking have been observed; a nationally representative analysis showed that 65% of smokers reported receiving smoking cessation advice from their physician.<sup>30</sup>

A number of barriers reduce the capacity and feasibility of delivering lifestyle-related counseling in clinical settings. Some of the main barriers include: (1) the need to focus on more medically urgent issues; (2) inadequate clinical training, self-confidence, or reimbursement; (3) low perceived patient demand for lifestyle counseling; (4) lack of supportive resources; (5) time restraints; and (6) perceived lack of efficacy.<sup>3,9,10,31</sup> In recognition of these barriers, the 5A Model was developed to provide a framework for clinical counseling with the requisite attention to the demands of clinical settings.<sup>3</sup>

The 5As represent brief and focused intervention strategies that can guide the process of counseling a patient about behavior change. These strategies are feasible to apply in care delivery with minimal training of clinicians and minimal changes to clinical workflows, and they can be built on and reinforced across multiple office visits with a patient over time. Herein, using the 5A Model, we provide guidance about how clinicians can counsel patients about healthy lifestyle behaviors.

## BEHAVIOR CHANGE STRATEGIES FOR ADDRESSING LIFESTYLE BEHAVIORS IN CLINICAL PRACTICE

Counseling within primary care and interventions referred through primary care are recommended to promote healthy behaviors<sup>25,26,32</sup>; however, implementation is suboptimal<sup>28–30</sup> and can be challenging. In this section, we describe key principles for brief patient-centered counseling and strategies for effective implementation.

The Institute of Medicine report, *Crossing the Quality Chasm*, concluded that patient centeredness is a key attribute of quality care.<sup>33</sup> An informed, activated patient is central to a productive patient-clinician relationship,

**Table 1.** 5As and Best Communication Practices for Clinicians to Provide Patient-Centered Care for Healthy Lifestyle Change at Every Visit

5As*	Clinician action/aim*	Clinician communication skills†	Patient-centered care‡
Assess	To seek to understand what patient knows about a lifestyle behavior(s), why it matters to their health, and their intention to change their behavior	OARS approach O: Open-ended question A: Affirm what patient says R: Reflect what patient says S: Summarize	Support for patient autonomy by building on what they know and what they would like to change
Advise	To discuss health risks and benefits of behavior change, including offering information that corrects patient's misunderstanding and gaps in knowledge without being judgmental or confrontational	Ask-Tell-Ask: Ask patient for permission to offer more information Give clear, specific, personalized (or general) advice to change Determine what the patient wishes to do based on information discussed	Support for patient autonomy and relatedness by engaging them in a discussion of personalized recommendations for behavior change
Agree	To collaboratively set SMART goals§ for behavior change	Shared decision-making: Discuss with patient and agree on goals that are specific, measurable, achievable, realistic, and timed	Support for patient competence and relatedness by accounting for their preference and confidence
Assist	To encourage patient-selected solutions and action steps for addressing personal barriers to behavior change	5-step problem-solving counseling: Identifying personal barriers Brainstorm solutions Analyze pros and cons of the solutions (cost-benefit analysis) Choose the desired solution Develop an action plan	Support for autonomy, competence, and relatedness through solutions and motivation-focused problem solving and action planning
Arrange	To specify the next step (visit, call, reminder) to follow up on progress, provide referrals and access to resources based on patient preference	Tell-back/Teach-back: Ask patient to summarize their understanding of the next steps to ensure common understanding and enhance patient recall and accountability	Support for competence and relatedness through frequent follow-up to closely monitor patient's progress and support gradual steps toward their goal

\*Each of the 5As presents clinicians with the specific action step, but the 5As do not have to be implemented in linear sequence, and they can be repeated in various sequences depending on the patient and context.

†To successfully implement the 5As, clinician training on effective communication skills and practices is needed.

‡The Self-Determination Theory provides a solid theoretical underpinning for patient-centered care. It posits that human motivation is driven by fulfillment of 3 intrinsic psychological needs: (1) perceived autonomy or self-volition, (2) perceived competence and growth, and (3) perceived relationship and connection with others.

§SMART goals are specific, measurable, achievable, realistic, and timed.

which is fostered by ongoing self-management support. The 5A Model offers a clinical framework rooted in behavior change principles to promote individual autonomy, relatedness, and competence through patient-centered care. It is structured and pragmatic for implementation in busy practice settings. It is action and solution oriented and is grounded in motivational principles for behavior change based on Self-Determination Theory.

In psychology, the concept of self-determination refers to an individual's ability to make choices and manage their own life, which affects motivation. People are more motivated to take action when they believe that they can affect the outcome. Therefore, self-determination is an important concept in health and well-being, and Self-Determination Theory provides a solid theoretical underpinning for patient-centered care. Self-Determination Theory posits that 3 intrinsic psychological needs drive human motivation and behavior: (1) autonomy (ie, choice and control); (2) competence (ie, knowledge, skills, and ability to perform a behavior); and (3) relatedness (ie, connection to important others).<sup>34,35</sup> Fulfillment of these

intrinsic needs promotes internalization and integration of the behavior with one's sense of self (eg, "I am a person who routinely practices a healthy lifestyle"; "I am a person who typically eats a healthy diet"; "I am a person who tries to be more physically active and less sedentary on most days"). Internalization and integration of a behavior with one's sense of self increases intrinsic motivation to perform the behavior; this increases the likelihood of meaningful and lasting behavior change and, in turn, promotes health and well-being.

Table 1 summarizes the 5As and best practices for clinicians to provide brief patient-centered counseling. To facilitate usability and implementation within the constraints and demands of clinical settings, the approach we have outlined is brief and can be delivered efficiently (<15 minutes) to capitalize on the unique position of clinicians and, in particular, physicians, to initiate patient conversations to encourage healthy lifestyle behaviors. Physicians are viewed by the public as a credible source of health information<sup>10</sup> and reach a large proportion of the US population; in 2016, there were 883.7

million physician office visits and 54.5% of these visits were made to primary care physicians.<sup>36</sup> However, we acknowledge that clinicians realistically may not be able to provide the intervention intensity that is needed for effective behavior change. The 2020 USPSTF recommendation statement on behavioral counseling interventions to promote a healthy diet and physical activity for cardiovascular disease prevention concluded that effective behavioral counseling includes a median of 12 contacts, with an estimated 6 hours of contact over 12 months, and may be provided by physicians or nonphysicians including nurses, registered dietitians, nutritionists, exercise specialists, physical therapists, masters- and doctoral-level counselors trained in behavioral methods, and lifestyle coaches.<sup>25</sup> This underscores the critical need for clinicians to collaborate with other members of the health care team, community, or other organizations/services to facilitate patient access to an effective level of behavioral counseling. A number of other barriers to the 2020 USPSTF Recommendations and delivery of lifestyle-related behavior change in clinical practice have been previously described related to the health care system and reimbursement,<sup>22,37,38</sup> which are outside the scope of this advisory. Here, we describe each of the 5As and intervention strategies for clinician-led implementation in clinical practice.

1. Assess: To assess a patient's lifestyle-related risk factors, data collected from screening tools integrated into electronic health record systems may be used. If electronic health records that have a patient portal are used, it may be possible for patients to complete electronic questionnaires in the portal before their clinic visit. Alternatively, paper-based screening tools/questionnaires or simple screening questions may be used as outlined in the sections on individual lifestyle factors. Clinicians should also assess patients' beliefs and motivation for behavior change to improve their health and well-being. The OARS approach is fundamental to motivational interviewing.<sup>39</sup>
- O Open-ended question: For example, What do you think if we talk for a couple minutes about your eating habits/physical activity habits/sleep habits/use of tobacco products? Why is eating healthier/being more physically active/sleeping better/quitting tobacco products important to you? What would your life be like/how would it affect your health if you were able to eat healthier foods/be more physically active/sleep better/stop using tobacco products?
- A Affirm what patient says: "It sounds like \_\_\_\_ is important to you"; "It sounds like you would like to \_\_\_\_"; "I hear you saying that you want to change \_\_\_\_".
- R Reflect what patient says: Try to use patient phrases of positive aspects of change verbatim or very closely paraphrased.

- S Summarize: Combine 2 or 3 thoughts the patient has provided across the OAR areas that seem to describe why they are wanting to make a change. Areas of struggle or challenges can also be acknowledged. It is important to acknowledge if the patient expresses ambivalence.
2. Advise: Next, the clinician will advise the patient on behavior change based on personal health risks. Ask-Tell-Ask is a collaborative approach that begins with the clinician asking permission to offer advice (First Ask).<sup>40</sup> Patients are probably more receptive when advising follows assessing what the patient knows; advice given should be clear, specific, and personalized to address gaps in knowledge and understanding (Tell). This is also an opportunity to correct a patient's misunderstanding, without being judgmental or confrontational. Once a shared understanding of the personal health risk has been established, the clinician should ask questions to determine what action the patient wishes to take to change the health behavior (Final Ask).
3. Agree: With an understanding of what behavior the patient would like to change, the clinician can discuss and agree with the patient on a set of SMART goals (ie, specific, measurable, achievable, realistic, and timed goals). Shared decision-making allows a clinician and patient to together determine the goals of behavior change that the patient has the best chance of achieving, so that the patient experiences success and enhanced self-efficacy.
4. Assist: After agreeing on specific goals, the clinician should assist the patient to anticipate barriers to behavior change and develop a specific action plan. Assisting does not imply that the clinician does the work. Rather, clinicians should help patients develop a positive way of thinking about challenges to changing a health behavior and the ability to problem solve. They can do so effectively by guiding patients through a 5-step problem-solving process: (1) identifying barriers to behavior change; (2) brainstorming solutions; (3) analyzing the pros and cons of the solutions (cost-benefit analysis); (4) choosing the desired solution; and (5) developing an action plan. This stepwise approach to fostering problem-solving skills is theory based and has been evaluated extensively in behavioral and psychosocial interventions.<sup>41</sup> This approach supports patient-centered care because it is the patient who defines barriers to changing their behavior and identifies solutions and the most appropriate course of action.
5. Arrange: Health behavior change is an ongoing, iterative process; arranging follow-up support is important to produce meaningful and lasting behavior change. Clinicians should specify the next step to follow up on, measure progress,

provide referrals to other health professionals and access to clinical and community resources based on patient preferences. Using tell-back, or respectful teach-back, clinicians can ensure common understanding and enhance patient recall and accountability by asking the patient to summarize their understanding of the next steps.<sup>42</sup> It is recommended that clinicians refer patients to effective behavioral intervention programs in clinical and community settings or evidence-based electronic interventions that go beyond what clinicians can offer during brief, episodic office visits. The USPSTF recommends (grade B) referring adults with CVD risk factors to behavioral counseling interventions to promote a healthy diet and physical activity.<sup>25</sup>

## PRIORITIZING LIFESTYLE BEHAVIOR CHANGE COUNSELING IN CLINICAL PRACTICE

The goal for patient-centered counseling is increased adherence to healthy lifestyle behaviors, which is realistically achieved by incremental small changes that shift lifestyle behaviors in a healthier direction. A healthy lifestyle encompasses many behaviors, and most patients will have a number of suboptimal lifestyle behaviors. Intervening on multiple behaviors at the initial or even subsequent patient visits may not be feasible. Prioritizing a single health behavior change given the limited time available during a clinical encounter can be a daunting and complex task for clinicians and other health care professionals. Thus, it is important to consider several issues that may influence which behavior(s) should be addressed, in what order, and where and when to begin.

One approach is to prioritize lifestyle-related behavior changes that have the strongest evidence for CVD risk reduction and the greatest magnitude of benefit with consideration for the patient's clinical profile. The INTERHEART Study evaluated the effect of modifiable risk factors associated with myocardial infarction in 52 countries, including lifestyle factors defined as smoking, intake of fruits and vegetables, and physical activity.<sup>43</sup> After multivariate adjustment, smoking was the strongest risk factor for myocardial infarction (odds ratio, 2.95 [99% CI, 2.72–3.20]), and daily intake of vegetables and fruits (odds ratio, 0.70 [99% CI, 0.64–0.77]) and moderate or strenuous physical activity (odds ratio, 0.72 [99% CI, 0.65–0.79]) were protective. However, risk of myocardial infarction was reduced by 80% in those with all of the healthy lifestyle factors. Similarly, in a combined analysis of 3 prospective cohort studies, current nonsmoking (hazard ratio [HR], 0.56 [95% CI, 0.47–0.66]), body mass index <30 kg/m<sup>2</sup> (HR, 0.66 [95% CI, 0.58–0.76]), regular physical activity (HR, 0.88; 95% CI, 0.80–0.97), and

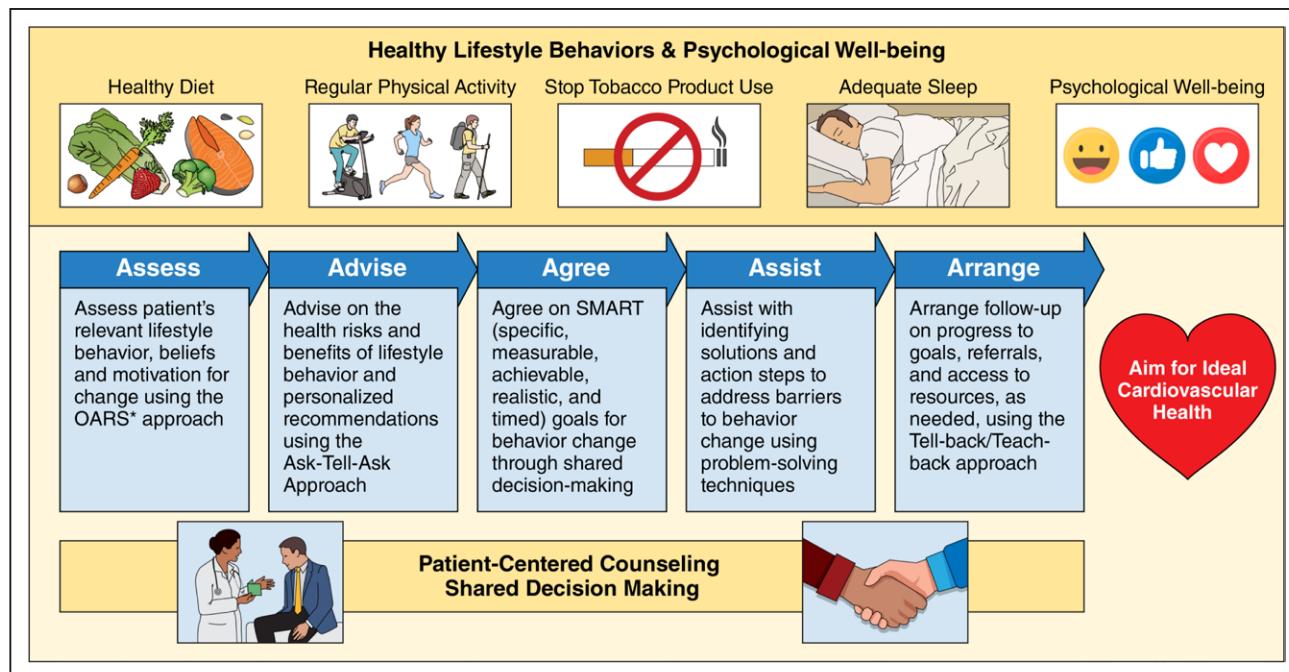
a healthy diet (HR, 0.91 [95% CI, 0.83–0.99]) all lowered the risk of coronary disease, although as indicated by the HRs the risk reduction differed.<sup>20</sup> There are challenges with a risk reduction–based approach and rank ordering of lifestyle interventions. This approach may not adequately account for the level of difficulty or motivation of change for the patient, the potential for relapse, or the potential synergies that may result when multiple lifestyle changes are made simultaneously. For example, physical activity and a healthy diet may mitigate weight gain with tobacco cessation and improve long-term cessation rates.

A second approach is to prioritize health behavior change based on a collaborative process between the clinicians and patient in the context of shared decision-making. Beginning with a patient-centered conversation, as part of Assess (first A), may help to understand factors that will influence long-term success and improve adherence for the patient.<sup>44</sup> Motivational interviewing (Table 1) will assist in identifying how important the benefits of lifestyle interventions are to the individual patient, how confident the patient is that they can make changes, and how ready the patient is to start the change process.<sup>45</sup> This approach allows clinicians to clearly describe the level of risk and benefit associated with each lifestyle factor and enables patients to communicate their personal priorities and the value they place on healthy lifestyle interventions as part of the second A, Advise.

During the clinician-patient discussion, psychological factors (eg, anxiety/depression) and patient beliefs about behavior change should be assessed for potential impact on adherence to healthy lifestyle behaviors. Lower health literacy, socioeconomic status, and educational level may affect the feasibility of lifestyle-related behavior change and should be carefully considered throughout the patient-centered counseling process.

Effective communication between clinicians and patients is the foundation for treatment adherence and continuation.<sup>46</sup> The success of lifestyle intervention and behavior change depends on the patient's willingness to return for follow-up and the feeling of safety to honestly communicate barriers, relapses, and personal challenges. Clinicians should avoid conveying unintentional biases by using words that may be perceived by the patient as judgmental or that cause the patient to internalize stigmatizing beliefs about themselves. Clinicians should also avoid dichotomous or all-or-nothing thinking and counseling. Using the terms "good" and "bad" or "healthy" and "unhealthy" implies that all behaviors fall into 2 mutually exclusive categories. These characterizations are not accurate and can create barriers as patients begin to move along a continuum of change. Using a phrase such as "this choice is more in line with your personal goals" can help patients think more flexibly and less in terms of "failure" and "success."<sup>46</sup>

In summary, the optimal approach to successful prioritization of lifestyle interventions and behavior change



**Figure.** The 5A Model for lifestyle-related behavior change counseling in clinical settings.

CVD indicates cardiovascular disease.

\*OARS, open-ended question/affirm what patient says/reflect what patient says/summarize.

is one that includes: (1) effective communication by the clinician about the level of risk conferred by each lifestyle factor and the potential magnitude of benefit with behavior change; (2) patient-centered discussion in alignment with the 5As to establish patient values, preferences, and readiness to change; (3) implementation of interventions as agreed on in the context of shared decision-making; and (4) ongoing follow-up to ensure the continuation of healthy lifestyle behaviors and to provide reinforcement of support in the event of relapse.

## STRATEGIES FOR ADDRESSING LIFESTYLE BEHAVIORS IN CLINICAL PRACTICE

In the sections that follow, how clinicians can use the 5As to briefly advise their patients on each individual lifestyle factor, including strategies for implementation, will be described.

This approach is centered on clearly and specifically describing the relevance of the lifestyle-related risk factor for the patient, agreeing on a goal to modify the lifestyle factor, advising the patient on potential ways to achieve the agreed-on goal and overcome barriers, and appropriate follow-up or referral to comprehensive counseling programs and specialty consultations and treatment (Figure). As discussed in the preceding section, focusing on a single lifestyle-related risk factor (or a few

closely related risk factors) is a realistic strategy for each clinical encounter. Clinicians should avoid trying to intervene on multiple lifestyle-related risk factors across all the following domains in a single visit. A more effective strategy is to make a follow-up plan (as part of Arrange) to enable sufficient focus on each risk factor and incremental intervention.

### Diet/Nutrition

Only 1.4% of US adults receive an ideal score for the diet component of AHA's Life's Simple 7 for cardiovascular health.<sup>1</sup> Overall, 50% of the US population has a poor diet score defined by suboptimal intake of fruits and vegetables, wholegrains, fish and shellfish, sugar-sweetened beverages, and sodium. The dietary patterns that are recommended for CVD risk reduction are appropriate for energy needs and abundant in fruits, vegetables, legumes, whole grains, nuts and seeds, low-fat/fat-free dairy products, fish, and vegetable protein or lean animal proteins in addition to being low in sodium and added sugars.<sup>2,13,47,48</sup> Foods high in saturated fat should be replaced with foods high in unsaturated fats, in particular, polyunsaturated fats. A description of the recommendations for each food group by energy needs can be found in the 2016 AHA scientific statement "Recommended Dietary Pattern to Achieve Adherence to the American Heart Association/American College of Cardiology (AHA/ACC) Guidelines."<sup>13</sup>

Given the low level of adherence to recommended dietary patterns, significant efforts are needed to improve this in clinical settings. Nutrition counseling by primary care physicians has been shown to significantly improve dietary intake, and reduce triglycerides, low-density lipoprotein cholesterol concentrations, and body weight.<sup>49–51</sup> Below, we describe how the 5A Model can be implemented by clinicians to address dietary risk factors and promote behavior change.

**1. Assess:** A number of quick diet assessment tools/screeners have been developed for clinical practice including the Rapid Eating Assessment for Participants (REAPS)<sup>52</sup> and Starting the Conversation diet.<sup>53</sup> In Table 2, the questions included in these quick diet assessment screeners are provided and may be used as part of diet assessment. A recent AHA scientific statement on rapid diet assessment screening tools for CVD risk reduction for use in health care settings concluded that a strong rationale exists for widespread adoption of diet assessment in primary care and relevant specialty care prevention settings; when evaluated against theory and practice-based criteria, these tools are valid and feasible for use in clinical settings including integration into electronic health records.<sup>54</sup> In general, diet assessment screeners assess the frequency of consumption of recommended foods (eg, fruits, vegetables, whole grains) and the frequency of noncore foods (eg, sources of refined grains, added sugar and salt). Some screeners include questions related to where the food was consumed or purchased, frequency of meals and snacks, when and where the food was consumed, and readiness to change dietary habits. To maximize the use of clinician time, diet screeners are likely best administered in the waiting room or completed by the patient before the visit.

Alcohol intake is not typically included in diet assessment screeners, but may be assessed with the following 3 questions<sup>55</sup>:

- On average, how many days per week do you drink alcohol?
- On a typical day when you drink, how many drinks do you have?
- What is the maximum number of drinks you have had on any given occasion during the past month?

**2. Advise:** Clinicians should convey the importance of a healthy diet for overall good health and advise the patient on their specific dietary risks. The clinician may also communicate to the patient how their dietary risks are linked to specific health concerns (eg, abdominal obesity, high blood pressure [hypertension], high cholesterol [hypercholesterolemia], high blood glucose [hyperglycemia], CVD) and the potential health and non-health-related benefits of dietary changes that may be motivating to the

**Table 2. Quick Diet Assessment Tools/Screeners Developed for Clinical Practice**

REAPS <sup>52</sup>
In an average week, how often do you:
1. Skip breakfast?
2. Eat ≥4 meals from sit-down or take-out restaurants?
3. Eat <2 servings of whole-grain products or high-fiber starches a day? (Serving=1 slice of 100% whole-grain bread; 1 cup whole-grain cereal like Shredded Wheat, Wheatus, Grape Nuts, high-fiber cereals, oatmeal, 3–4 whole-grain crackers, ½ cup brown rice or whole-wheat pasta, boiled or baked potatoes, yuca, yams, or plantain.)
4. Eat <2 servings of fruit a day? (Serving=½ cup or 1 medium fruit or ¾ cup 100% fruit juice.)
5. Eat <2 servings of vegetables a day? (Serving=½ cup vegetables, or 1 cup leafy raw vegetables.)
6. Eat or drink <2 servings of milk, yogurt, or cheese a day? (Serving=1 cup milk or yogurt; 1½ to 2 ounces cheese.)
7. Eat >8 oz (see sizes below) of meat, chicken, turkey, or fish per day? (Note: 3 oz of meat or chicken is the size of a deck of cards or ONE of the following: 1 regular hamburger, 1 chicken breast or leg (thigh and drumstick), or 1 pork chop.)
8. Use regular processed meats (like bologna, salami, corned beef, hotdogs, sausage, or bacon) instead of low-fat processed meats (like roast beef, turkey, lean ham; low-fat cold cuts/hotdogs)?
9. Eat fried foods such as fried chicken, fried fish, French fries, fried plantains, tostones, or fried yuca?
10. Eat regular potato chips, nacho chips, corn chips, crackers, regular popcorn, nuts instead of pretzels, low-fat chips or low-fat crackers, air-popped popcorn?
11. Add butter, margarine, or oil to bread, potatoes, rice, or vegetables at the table?
12. Eat sweets like cake, cookies, pastries, donuts, muffins, chocolate, and candies >2 times/d?
13. Drink ≥16 oz of nondiet soda, fruit drink/punch or Kool-Aid a day? (Note: 1 can of soda=12 oz.)
14. You or a member of your family usually shops and cooks rather than eating sit-down or take-out restaurant food?
15. Usually feel well enough to shop or cook?
16. How willing are you to make changes in your eating habits to be healthier?
Starting the Conversation: diet <sup>53*</sup>
Over the past few months:
1. How many times a week did you eat fast food meals or snacks?
2. How many servings of fruit did you eat each day?
3. How many servings of vegetables did you eat each day?
4. How many regular sodas or glasses of sweet tea did you drink each day?
5. How many times a week did you eat beans (like pinto or black beans), chicken, or fish?
6. How many times a week did you eat regular snack chips or crackers (not low-fat)?
7. How many times a week did you eat desserts and other sweets (not the low-fat kind)?
8. How much margarine, butter, or meat fat do you use to season vegetables or put on potatoes, bread, or corn?

REAPS indicates Rapid Eating Assessment for Participants.

\*Scale adapted with permission from the Center for Health Promotion and Disease Prevention, University of North Carolina at Chapel Hill, and North Carolina Prevention Partners.

**Table 3.** Dietary Changes That May Assist With Meeting Dietary Recommendations

Starting the conversation: diet screener component*	Reasonable target change†	Example of realistic small substitutions‡
1. Fast food meals or snacks/mo	↓ 1 fast food meal/wk	Replace with a prepared food from a supermarket or a homemade meal
2. Servings of fruit/d	↑ 1 serving/d	Eat fresh, frozen, or canned fruit (without added sugar) as a snack
3. Servings of vegetables/d	↑ 1 serving/d	Add fresh, frozen, or canned vegetables (without added salt) to a main meal
4. Regular sodas, juices, or other sugary beverages/d	↓ 1 sugary beverage/d	Replace a regular soda with water, seltzer, tea, or coffee
5. Servings of beans, nuts, chicken, or fish/wk	↑ Fish/seafood by 1 serving/wk	Replace fast food entrée or processed meat (eg, ham) sandwich with tuna fish sandwich
6. Regular snack chips or crackers/wk	↓ 1 serving/wk	Replace 1 serving of chips or crackers with unsalted nuts
7. Desserts and other sweets/wk	↓ 1 serving/wk	Replace 1 sugary sweet or dessert with fruit or a handful of unsalted nuts
8. Use of butter and/or intake of animal fat	Decrease use as a seasoning Reduce intake of visible animal fat	Replace butter with vegetable oil and herbs and spices Choose lean cuts of meat or remove visible fat before eating
9. Use of salt in cooking or at the table	Decrease use as a seasoning	Replace with herbs and spices
10. Alcoholic beverages	Men: ≤2 drinks/d Women: ≤1 drink/d <sup>56</sup>	Replace with noncaloric beverages, eg, sparkling water, seltzer

\*An example of a brief nutrition behavior assessment tool. Modified from Paxton et al<sup>53</sup> with permission. Copyright © 2011, Elsevier.

†Reasonable target changes in consumption. Adapted from Mozaffarian and Capewell<sup>57</sup> with permission. Copyright © 2011, BMJ Publishing Group Ltd.

‡Example of realistic small substitutions. Reproduced from Kahan and Manson<sup>58</sup> with permission. Copyright © 2017, American Medical Association. All rights reserved.

patient. Non-evidence-based information about diet is widely available on the internet and it is common for patients to have misunderstandings about healthy dietary practices. Any misunderstandings should be corrected in a nonjudgmental, nonconfrontation manner.

3. Agree: Patients will frequently desire to change several aspects of their diet, but to improve more than one at a time may not be feasible for the patient. Therefore, a patient-centered approach should be taken to identify a dietary change that will both improve their dietary intake and be feasible and appropriate for the patients to implement. In some cases, 2 behaviors can be complementary and may be simultaneously changed, for example, when exchanging a less healthy food for a healthier option. Table 3 includes dietary changes that will assist with meeting dietary recommendations<sup>58</sup> and may form the basis of the agreed-on dietary goal.
4. Assist: Several factors contribute to food choices and dietary habits, such as the nutrition environment, economic considerations, and cultural preferences.<sup>59</sup> The clinician should assist the patient to anticipate barriers to the agreed-on dietary change and develop a plan to facilitate achieving the goal.
5. Arrange: Clinicians should clearly describe a plan for following up on progress made with the patient. Effective individualized dietary counseling is time consuming; therefore, referral to a registered dietitian nutritionist for medical nutrition therapy is prudent for diet-related CVD risk management, in particular, overweight and obesity.

## Physical Activity

Approximately a quarter of US adults meet the physical activity guidelines for Americans.<sup>1</sup> The 2018 physical activity guidelines for Americans and the 2019 American College of Cardiology/American Heart Association guideline on the primary prevention of CVD recommend that all adults, including those with chronic conditions or disabilities who are able, accumulate at least 150 to 300 minutes of moderate-intensity physical activity per week.<sup>2,60</sup> This equates to 20 to 30 minutes of brisk walking per day. Additional health benefits are gained from physical activity beyond this level.<sup>61</sup> It is also recommended that muscle-strengthening activities are done on ≥2 days per week.<sup>60</sup>

A positive dose-response relationship exists between all-cause mortality and the combination of increased sitting time and decreased physical activity. However, the all-cause mortality risk associated with being sedentary (ie, sitting for >8 hours per day) and physically inactive (<5 minutes of moderate-intensity activity per day) is substantially greater (HR, 1.59 [95% CI, 1.52–1.66]) than being sedentary and engaging in 25 to 35 minutes per day (HR, 1.27 [95% CI, 1.21–1.33]), 50 to 65 minutes per day (HR, 1.13 [95% CI, 1.07–1.19]), or 60 to 75 minutes per day (HR, 1.04 [95% CI, 0.99–1.10]) of moderate-intensity physical activity; similar trends are observed for these physical activity levels across levels of sitting time (<4, 4–6, 6–8 hours per day).<sup>62</sup> Thus, the greatest magnitude of all-cause mortality risk reduction is observed in sedentary adults who start engaging in some physical activity, although all adults will benefit from being more active.

Interventions to increase physical activity reduce all-cause and CVD mortality, and incident myocardial infarction.<sup>63-65</sup> In addition, physical activity as a therapeutic intervention is cost-effective<sup>66</sup> and as efficacious as common CVD medications.<sup>67,68</sup> As a result, exercise-based cardiac rehabilitation is a recommended therapy following myocardial infarction (Class 1, Level of Evidence B).<sup>69</sup> Given the extensive benefits of physical activity, counseling by clinicians to increase physical activity is recommended.<sup>70</sup> A meta-analysis showed that patients who received physician counseling to increase physical activity levels had a 42% greater likelihood of being more active compared with no intervention (number needed to treat=12).<sup>71</sup> However, as few as one-third of clinicians talk to their patients about physical activity.<sup>72</sup> It is notable that physicians who are active themselves are more likely to discuss physical activity with their patients.<sup>73</sup> Therefore, it is recommended that clinicians both counsel their patients on physical activity and also be active themselves, not only to be an effective role model, but to derive the health benefits of physical activity.<sup>70</sup> Next, we summarize how the 5A Model can be used by clinicians to promote patient engagement in physical activity.

**1. Assess:** Assessment of patient physical levels should be considered a vital sign and assessed at every visit and documented in the patient's medical record. The following 2 simple questions provide adequate information and take only a few minutes.<sup>74</sup>

- On average, how many days per week do you engage in moderate or greater physical activity (increases your heart rate or makes you breathe harder than normal, eg, a brisk walk)?
- On those days, how many minutes do you engage in activity at this level?

The answers should be documented, and the approximate total number of minutes per week of at least moderate physical activity, as well. The clinician may also ask questions related to exercise safety (eg, experiences of chest pain or dizziness while exercising previously) and physical limitations (eg, injuries, joint pain) to inform individualized ability-focused physical activity counseling.

**2. Advise:** For those patients who are not meeting the physical activity recommendations, discussion should continue on the benefits of regular physical activity with emphasis on the long-term (risk reduction) and immediate (psychological well-being, increased energy) benefits. The patient's readiness to increase their physical activity levels should be determined. Discussion should include the patient's perceptions of physical activity, and lifetime experience with physical activity, including any physical limitations or safety issues. The 2018 physical activity guidelines for Americans includes suggestions for how individuals with chronic diseases and disabilities can meet the physical activity recommendations.<sup>60</sup> The Exercise is Medicine initiative, managed by the American

College of Sports Medicine, aims to make physical activity assessment and promotion a standard in clinical care and has a number of resources and exercise prescription templates for clinicians available on their website.<sup>75</sup> For patients reporting adequate physical activity, the importance of maintaining their physical activity levels should be reinforced.

- 3. Agree:** The SMART framework should be used to help guide physical activity goal setting with a particular focus on activity frequency, intensity, duration, and type/modality. Shared decision-making with the patient should form the basis of the goal-setting discussion. The patient should be guided to focus on the process of physical activity behavior and identify the types of physical activity they enjoy or may enjoy (eg, competitive, recreational, social, solitary, outdoors, indoors, utilitarian); the best physical activity for any individual is the one the person will do. A common misconception is that physical activity needs to be a focused and continuous bout. Bouts, or episodes, of moderate-to-vigorous physical activity of any duration contribute to total physical activity levels.<sup>60</sup> Tasks such as gardening, various household chores, and active transport contribute to activity levels. The clinician should discuss with the patient how physical activity can be incorporated into the patient's lifestyle and simple ways to increase physical activity such as taking the stairs, walking to meetings, and parking further from their destination, with attention to the patient's abilities.
- 4. Assist:** Work with the patient to identify potential barriers and challenges to increasing physical activity and brainstorm solutions. This should take into account the resources and access to opportunities for physical activity in their community (eg, community centers, sidewalks, safety, parks). Identify possible social support that may assist the patient with increasing their activity in their household, social networks or within the community. Some patients may find various wearable devices or health and fitness apps helpful (see Use of Technology for Behavior Change section in this science advisory).
- 5. Arrange:** Arrange for ongoing follow-up and continue to assess physical activity levels at subsequent visits. Attention should be given to patients who are new to being active and those who may overdo physical activity, because this can lead to overuse injuries. Long-term maintenance of physical activity can be a challenge, so continue to encourage the patient and make them aware that any increase in physical activity is beneficial. Identify community groups such as Walk with a Doc<sup>76</sup> with which the patient can engage or consider starting this program into your clinical setting. In addition, patients may be referred to a clinical exercise program or an exercise professional such as a kinesiologist or

physical therapist. Consider using technology-supported follow-up such as telephone and video conferencing for increased patient convenience.

## Tobacco Product Use

Herein, we define tobacco products as cigarettes, cigarette tobacco, roll-your-own tobacco, smokeless tobacco products, electronic cigarettes (e-cigarettes) or electronic nicotine delivery systems, cigars, hookah (also called waterpipe tobacco), pipe tobacco, nicotine gels, and dissolvables, which is consistent with the scope of the US Food and Drug Administration regulatory authority.<sup>77</sup> Tobacco product use is a leading cause of death and disability in the United States.<sup>78</sup> In 2018, 19.7% of US adults >18 years of age used any tobacco product and nearly 4% reported use of ≥2 tobacco products.<sup>79</sup> Approximately 14% of US adults reported cigarette smoking, 3.9% used cigars, 1% used pipe/water pipes/hookah, 3.2% used e-cigarettes, and 2.4% used smokeless tobacco. Tobacco product use was higher in males (26%), adults with a General Education Development Certificate (41%), those with lower household income (<\$35 000 per year; 26%), gay/lesbian/bisexual adults (29%), individuals covered by Medicaid (28%), uninsured (30%), or with serious psychological stress (37%).<sup>79</sup> In youth, tobacco product use has been declining with the exception of e-cigarettes. In 2019, 47% of high school students and 20% of middle school students reported ever using e-cigarettes, and current use was reported by 28% of high school students and 11% of middle school students.<sup>80</sup>

Clinicians play a critical role in tobacco product cessation because they interface with >80% of tobacco product users each year. Brief advice from a clinician to quit using tobacco products increases the likelihood that a patient will quit and remain a nonuser 12 months later.<sup>81</sup> The 5A Model is recommended for engaging patients in tobacco product cessation.<sup>27,82,83</sup> Motivational interviewing increases the likelihood of tobacco cessation versus brief advice or usual care (risk ratio, 1.26 [95% CI, 1.16–1.36]); delivery by a primary care physician (risk ratio, 3.49 [95% CI, 1.53–7.94]) or in a shorter session (<20 minutes; risk ratio, 1.69 [95% CI, 1.34–2.12]) further increases the effectiveness.<sup>84</sup>

The 2019 AHA/ACC guideline for the primary prevention of CVD states there is Class 1 Level of Evidence A that tobacco product use should be assessed and recorded for all adults at every health care visit.<sup>2</sup> Furthermore, adults using tobacco products should be firmly advised to quit, and offered cessation treatment with the option to refuse treatment.<sup>85</sup> A case-control analysis from the National Lung Cancer Screening Trial found that 1 year after lung screening, >75% of patients reported being asked by their physician about smoking (Assess) and being advised to stop smok-

ing (Advise); however, only 56% reported that their physician talked to them about how to quit (Assist), and 10% suggested a follow-up appointment or call about quitting smoking (Arrange).<sup>86</sup> In this study, physician delivery of Assist and Arrange increased patient odds of quitting by 40% and 46%, respectively, after adjustment for demographic factors, nicotine dependence score, and quit motivation score. This analysis underscores the importance of delivering the final 2 As, which clinicians do at lower rates than the first 3 As. Next, we describe how to implement the 5A Model for smoking cessation.

1. Assess: Ask about and document in the medical record a patient's tobacco product use status at every visit, including type of use (eg, cigarettes, cigars, e-cigarettes), degree, and frequency (eg, use duration and times of use per day/week). For former tobacco product users, assess the risk for relapse. Two simple questions that may be used to initially assess tobacco product use<sup>82</sup> are:
  - Do you smoke cigarettes?
  - Do you use any tobacco products?Tobacco product use may not be openly reported, or patients may not identify as users (eg, smoker), so asking about tobacco product use in multiple questions may improve disclosure.<sup>2,85</sup> A question like the following may assist in tobacco product use assessment: "Have you used any tobacco products in the past 30 days, even a puff?" If the patient answers "yes," they should be considered a current tobacco product user. The patient's motivation to quit, previous quit attempts, perceived confidence in their ability to quit, and tobacco product use by other members of the household or within social networks may be included in the assessment.<sup>85</sup>
2. Advise: Clinicians should clearly and strongly convey the importance of tobacco product cessation. Advice should be delivered in a nonjudgmental, supportive manner, and personalized to focus on the health benefits or other potentially motivating benefits (eg, financial savings, being a role model, or other social reasons) of quitting.
3. Agree: For all patients using tobacco products, a goal for cessation should be discussed. Depending on where the patient is in the behavior change process, the patient may not be ready to make an attempt to quit, but may be willing to reduce frequency of use, attend a behavioral support program, use a community-based support program (eg, telephone Quitline, smokefree.gov, becomeanex.org), or take-home resources to read. For patients ready to attempt to quit, a goal quit date should be agreed on, ideally within 2 to 4 weeks.<sup>82,85</sup>
4. Assist: Clinicians should provide patients with appropriate treatment options to assist with achieving the agreed-on goal. This may include pharmacological

therapy and assistance to identify a local tobacco cessation program or service. USPSTF concluded that, at present, evidence is insufficient to recommend e-cigarettes for tobacco cessation in adults.<sup>27</sup> The 2018 ACC expert consensus decision pathway on tobacco cessation treatment provides detailed guidance on how to assist patients and implement evidence-based therapies and considerations for special patient populations.<sup>85</sup>

5. Arrange: A plan for follow-up should be arranged because the risk of relapse is high for tobacco users. The risk of relapse is highest in the first few days and weeks after making a quit attempt so follow-up contact should be made within 2 to 4 weeks either in person, by phone, or through the patient portal if using electronic health records.<sup>85</sup>

## Sleep

Inadequate sleep duration and sleep disorders are increasingly being recognized as risk factors for CVD. For the first time, the 2019 AHA heart and stroke statistics included a sleep section,<sup>87</sup> and it was recommended in the 2016 AHA scientific statement on sleep duration and quality that sleep behavior be addressed as part of efforts to promote ideal cardiovascular health.<sup>88</sup> That scientific statement concluded that both short (<7 hours per night) and long ( $\geq 9$  hours per night) sleep duration and sleep disorders (eg, sleep-disordered breathing, insomnia) are adversely associated with CVD risk in adults.<sup>88</sup>

The American Academy of Sleep Medicine and the Sleep Research Society recommend that adults sleep for  $\geq 7$  hours per night on a regular basis.<sup>89</sup> Approximately 20% of adults have a sleep duration <7 hours per night based on 2015–2016 National Health and Nutrition Examination Survey data.<sup>1</sup> Furthermore, a 2014 analysis of the Behavioral Risk Factor Surveillance System found that 65% of US adults have adequate sleep duration ( $\geq 7$  and  $<9$  hours per night).<sup>90</sup> Approximately 31% of US men and 17% of women 30 to 70 years of age have obstructive sleep apnea, defined as least 5 respiratory events per hour.<sup>91</sup> Next, we summarize how clinicians can identify and assist patients that have inadequate sleep duration. Clinical practice guidelines for the diagnosis and management of several sleep disorders, including obstructive sleep apnea<sup>92,93</sup> and chronic insomnia,<sup>94</sup> are available from the American Academy of Sleep Medicine<sup>95</sup> and should be followed if a patient presents with a sleep disorder, because this is beyond the scope of this science advisory.

1. Assess: Ask about a patient's usual duration of sleep, including daily bedtime and wakeup times, and how they perceive their quality of sleep. In addition, assessing for risk of obstructive sleep apnea, questions related to snoring (or partner-reported snoring), and excessive daytime somnolence should be asked. If the patient is a shift worker, then

**Table 4. Strategies to Establish Healthy Sleep Habits**

Establish a consistent sleep schedule. Keep the same wake-up and bed-time every day, even on weekends or during vacations
Set a bedtime that is early enough to enable at least 7 h of sleep
Only go to bed when feeling sleepy
If you do not fall asleep after 20 min, get out of bed
Establish a relaxing bedtime routine
Use your bed only for sleep and sex
Make your bedroom quiet and relaxing. Keep the room at a comfortable, cool temperature
Limit exposure to bright light in the evenings
Turn off electronic devices at least 30 min before bedtime
Do not eat a large meal before bedtime. If hungry at night, choose a light, healthy snack
Exercise regularly
Avoid consuming caffeine in the late afternoon or evening
Avoid consuming alcohol before bedtime
Reduce your fluid intake before bedtime

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information should be obtained about their working hours and sleeping pattern to assess the actual duration and quality of sleep. The following 4 questions from the Pittsburgh Sleep Quality Index<sup>96</sup> may be used to assess usual sleeping habits:

- During the past month, when have you usually gone to bed at night?
  - During the past month, how long has it usually taken you to fall asleep each night?
  - During the past month, when have you usually gotten up in the morning?
  - During the past month, how many hours of actual sleep did you get at night? (This may be different from time in bed.)
2. Advise: If a patient has an inadequate sleep duration, they should be advised about the importance of adequate sleep. Advice should focus on the health benefits but may also include other potential motivators such as positive effects on mood, psychological health, cognitive performance, and reduced pain symptoms.<sup>97</sup>
  3. Agree: In consultation with the patient, a goal for modifying sleep habits should be agreed on. This may be related to establishing a regular bedtime and wakeup time to increase sleep duration from the patient's current duration, which can be gradually increased to achieve the sleep recommendation. If the patient is not ready to change their sleep habits, a goal to monitor sleep timing and feelings of wakefulness and alertness could be established to increase awareness of sleep behavior. If a patient has difficulty falling asleep or staying asleep, the goal may be related to establishing habits that facilitate sleep<sup>98</sup> (Table 4).

**Table 5. Questions to Evaluate Psychological Well-Being as Part of Lifestyle-Related Behavior Change Counseling**

Characteristic	Questions clinicians can use for patient evaluation (ASSESS)	Questions clinicians can use to identify potential well-being or stress-related barriers to lifestyle change (ASSIST)
Psychological well-being		
Optimism	Do you expect that good things will happen for you in the future?	How do you think things will go with trying to _____?
	How do you think things will go with your health in the future?	
Positive affect or life satisfaction	How often do you experience pleasure or happiness in your life?	How do you think _____ will make you feel?
	Are you satisfied with how your life has gone and how you have lived it?	How do you think _____ will affect your life?
Gratitude	What, if anything, do you have to feel grateful for in your life?	
	Do you ever feel grateful about your health? Tell me about that.	
Leveraging personal strengths	What are your greatest strengths and skills?	How do you think your strengths and skills will help you with _____?
	When have you applied your best skills to improving your health?	
Stress		
Stress	On a scale of 1 to 10, how would you rate your feelings of stress today (or over the past few months)? Can you tell me about why you chose _____?	How do you think _____ will affect your stress levels?

Adapted from Kubzansky et al<sup>101</sup> with permission. Copyright © 2018, Elsevier.

4. Assist: Once a specific goal is agreed on, the clinician should assist the patient in developing an action plan to facilitate achieving the sleep goal. This will include discussing the patient's potential barriers to achieving the sleep goal.
5. Arrange: Patients experiencing sleeping difficulties may be referred to a sleep center, sleep medicine physician, or behavioral sleep medicine specialist for further evaluation and management.<sup>99</sup>

## CONSIDERATIONS FOR PSYCHOLOGICAL HEALTH AND WELL-BEING WHEN COUNSELING PATIENTS ABOUT LIFESTYLE-RELATED BEHAVIOR CHANGE

The definition of ideal cardiovascular health does not currently include components related to psychological health or well-being; however, direct and indirect links between psychological health and well-being are increasingly being realized.<sup>100–102</sup> Depression is associated with increased risk of CVD morbidity and mortality, and recommendations for screening, referral, and treatment have previously been published by the AHA and endorsed by the American Psychiatric Association.<sup>103</sup> To facilitate depression screening, most electronic health record systems have depression screening instruments embedded at the point of care. Anxiety,<sup>104</sup> posttraumatic stress disorder,<sup>105</sup> and other psychological conditions including chronic psychological stress are associated with increased CVD risk.<sup>106,107</sup> Diagnosis and management of psychological conditions should be part of CVD risk reduction efforts, as summarized previously.<sup>107</sup>

The absence of psychological conditions does not necessarily indicate well-being. Emerging evidence suggests that psychological well-being defined by characteristics such as life purpose, personal growth, positive emotion, life satisfaction, happiness, and optimism affect CVD risk.<sup>21,101,102,108</sup> Although psychological well-being may directly affect neurobiological processes to lower CVD risk, it may also indirectly act to affect CVD-related health behaviors.<sup>101,102,108</sup> The interrelations between psychological well-being and engagement in health behaviors will be the focus herein.

Consideration of patients' psychological well-being should underpin counseling for lifestyle-related behavior change. Positive psychological well-being, in particular, defined by the domains of optimism,<sup>109</sup> positive emotion,<sup>110</sup> and life satisfaction,<sup>111</sup> is associated with a greater likelihood of ideal cardiovascular health (including ideal health behaviors). These associations are likely bidirectional because greater engagement in healthy behaviors (eg, physical activity) can improve psychological well-being (eg, reduced stress and depression). Therefore, as part of behavior change counseling for increased adherence to healthy lifestyle behaviors, consideration should be given to psychological well-being. Table 5 provides some examples of questions clinicians can use to evaluate psychological well-being as part of lifestyle-related behavior change.

Psychological well-being may also reduce the likelihood of experiencing adverse amounts of stress or lessen the CVD-related effects of stress.<sup>101,102</sup> Chronic stress is defined as a cumulative result of repeated or prolonged stress exposure.<sup>112</sup> Greater stress levels are associated with smoking, poor diet, and a sedentary life-

style, although these lifestyle factors alone do not completely explain the increased risk of CVD with stress, which underscores the importance of reducing stress to lower risk of CVD.<sup>106</sup> Common stressors include those related to employment, caregiving, finances, or social isolation/loneliness.<sup>112</sup> In addition, social determinants of health or unmet social needs may also be causes of stress that can be addressed in clinical practice.<sup>113,114</sup> The 2019 American College of Cardiology/American Heart Association guideline on the primary prevention of CVD includes a Class 1 (strong) recommendation that social determinants of health should inform optimal implementation of treatment recommendations for CVD prevention.<sup>2</sup> In an accompanying science advisory we have described how social determinants of health and unmet social needs can be addressed as part of lifestyle-related behavior change.<sup>114a</sup>

In Table 5, we present a question clinicians can ask to identify patients experiencing stress. In some cases, greater engagement in healthy lifestyle behaviors (healthy diets, increased physical activity and adequate sleep) may reduce stress. Meditation, progressive muscle relaxation, mindfulness-based stress reduction, and cognitive behavioral therapy have been shown to reduce stress.<sup>107,115</sup> Referral to mindfulness-based programs and positive psychological interventions may assist with stress reduction.<sup>101</sup> Furthermore, patients may be referred to other health care professionals as appropriate, for example, a social worker, counselor, or psychologist.

## USE OF TECHNOLOGY FOR BEHAVIOR CHANGE

To assist in brief patient-centered counseling for health behavior change, clinicians may leverage health technologies with which patients are engaged. In 2019, 96% of US adults owned a cell phone, and the vast majority (81%) owned a smartphone.<sup>116</sup> Disparities across age, sex, race/ethnicity, income, education, or urban/rural inhabitance are not observed with cell phone ownership (all >91%). Greater variation is observed in smartphone ownership, although it is generally >70% across demographic categories; ownership is lower in adults ≥65 years of age (53%) and in adults with less than a high school education (66%). As the population ages, the percentage that owns a smartphone is likely to increase.

Health/wellness smartphones applications (apps) are among the most downloaded and expanding app categories. In 2017, 55% of the most downloaded health/wellness apps had sensor technology (smartphone sensors, wearables, vital sign sensors)<sup>117</sup> many of which measure physical activity. In 2019, 21% of US adults reported using a smart watch or fitness tracker; greater use was reported in women (25%), Hispanic adults

(26%), higher-income earners (31%), and adults with a higher education level (25%–27%).<sup>118</sup> Therefore, in the United States, smartphones are ubiquitous, health apps/tracking technologies are widely available, and devices such as smart watches and fitness tracker are increasing in popularity. These technologies offer considerable potential for patient self-monitoring, goal setting, and empowerment, and may assist clinicians in assessing lifestyle-related behaviors and nudging behavior change toward healthier patterns.

A major challenge in harnessing this rapidly evolving technology for behavior change is the lack of empirical evidence, quality control, and regulation<sup>119</sup>; the number and diversity of health technologies (apps, wearables) available make it difficult for clinicians to stay informed. Therefore, the focus of this section will be to summarize the most recent evidence for health technologies that patients may be using (commercially available), and to outline how clinicians can incorporate the use of health technology into patient-centered counseling with the intent of improving lifestyle-related behavior change using the 5A Model.

In 2017, ≈50% of all downloaded wellness-related health apps were focused on exercise and fitness (physical activity).<sup>117</sup> The second edition of the physical activity guidelines for Americans highlighted the potential role of pedometers and other wearable activity monitors, in combination with behavioral strategies such as goal setting and coaching, to increase physical activity by providing direct user feedback.<sup>60</sup> Recent systematic reviews suggest physical activity apps with or without a wearable connection modestly increase physical activity, in particular, in the short term (up to 3 months).<sup>120,121</sup> A systematic review of 15 studies showed that using a physical activity app alone or one that connects users to web-based social networking platforms (eg, Facebook, Twitter), increased physical activity in terms of daily steps, minutes of exercise, or reducing sedentary behavior.<sup>121</sup> Higher levels of engagement were observed when the app was connected to existing social networking platforms. These findings suggest that using a physical activity app that facilitates social support may assist with changing physical activity behaviors.

The evidence base for commercially available health apps focused on nutrition and smoking cessation is limited. The 2015 AHA scientific statement on mobile health for CVD prevention concluded that there was no empirical evidence for the efficacy of commercially available smartphone apps for smoking cessation.<sup>122</sup> More recently, a Cochrane Review that included 5 randomized controlled trials, concluded that smartphone apps do not improve the likelihood of smoking cessation compared with lower-intensity smoking cessation support; the evidence was rated as very low certainty.<sup>123</sup> Limited evidence currently exists for the effectiveness of apps for

**Table 6. Example of Developing a SMART Goal for Physical Activity Using a Wearable Activity Monitor, Smartphone That Measures Steps, or a Fitness Tracker**

1. Assess usual daily step count: For a patient who daily tracks steps, count the number of steps taken on several ordinary days.
2. Ask the patient what a realistic, achievable increase in their daily step count is: This could be made up of a short-term, medium-term, or longer-term goal. For example, a daily increase in step count (short term), with a goal to gradually increase the number of total daily steps each week (medium term), until the daily step goal is reached (longer term).
3. SMART* goal example: To increase my daily step count (usual daily step count 4000 steps) by 1000 steps/d, and each week increase my daily step count goal by 500 steps, until I reach my goal of 7000 steps/d.

This process may be modified to create a SMART goal for minutes of walking or other physical activity.

\*SMART goals are specific, measurable, achievable, realistic, and timed.

Adapted from the *Physical Activity Guidelines for Americans*, 2nd edition.<sup>60</sup>

self-monitoring of dietary intake<sup>124</sup> or changing dietary intake.<sup>125</sup>

As summarized, the development and proliferation of health technologies has outpaced research, and, for the majority of commercially available health technologies that may assist with lifestyle-related behavior change, evidence is lacking. Thus, for clinician-led behavior change counseling, it is more pertinent to gather information about a patient's current health technology usage and how their current usage may be leveraged for behavior assessment, goal measurement/monitoring, and motivating behavior change. This will enable the clinician to incorporate the patient's chosen health technology into behavior change counseling, if appropriate. A brief description of how health technologies may fit into the 5A Model follows.

1. Assess: As part of the patient assessment, a question(s) about health technology usage may be included to determine whether a patient is currently using or has access to any health technology. If a patient is using health technology, the clinician may ask the patient if this could be used in the assessment of the patient's behavior, because health technologies may provide a more objective assessment or longer-term data about habitual patterns than questionnaires. Data from wearables or smartphone apps that track daily step counts, minutes of physical activity, or other activity-related data, may be used to assess current physical activity levels.<sup>14</sup> Similarly, sleep data, dietary intake, and other health behaviors may be tracked by using health technologies.
2. Advise: If data from health technology were used to assess the patient's behavior in the first A, these data may be used to describe and reinforce the patient's health risk and why behavior change is needed. If the patient indicates they have access to health technology but are not currently using it, the clinician can explore why and may encourage use.
3. Agree: If the patient is currently using a health technology, the development of a SMART goal may be, in part, framed around the technology being used

(or the technology may have this functionality built in). For example, the specific goal may be based on a behavior that the patient is currently measuring using a health technology, enabling measurement and monitoring of progress toward the goal. These data could then be used to inform the realistic and achievable parts of the goal (Table 6).

4. Assist: The effectiveness of sustained long-term self-monitoring in lifestyle-related behavior change is well-established.<sup>22</sup> Many health technologies have the capability for self-monitoring and enable progress to be tracked in real time, which may serve as a motivator for behavior change.<sup>126</sup> However, at present, there are no specific commercial health technologies that are recommended for lifestyle-related behavior change in clinical practice. Some progress toward understanding the clinical utility of commercial technologies that measure physical activity has been made.

In the 2018 AHA scientific statement on routine assessment and promotion of physical activity in healthcare settings, 23 consumer-orientated wearable activity monitors were identified that offer potential for integration into health care settings.<sup>14</sup> Substantial variation in the validity, ability to assess compliance with physical activity guidelines, patient feasibility, and incorporation of behavior change strategies was observed in these wearable activity monitors; this underscores the challenges associated with the clinician's prescription of a particular device.

5. Arrange: If a patient is using a particular health technology and this has been incorporated into any of the previous 4 As, the clinician can describe how this health technology could be reviewed at the follow-up appointment, if appropriate (eg, reviewing physical activity levels from a wearable or app). Incorporating the information into the patient's medical record can facilitate follow-up discussions. Although not the focus of this section on commercially available technology, evidence-based electronic interventions are becoming increasingly available and may be appropriate for patient referral.

## SUMMARY AND CONCLUSIONS

This science advisory presents pragmatic strategies, based on the 5A Model, that clinicians and other health care professionals can use to counsel their patients at all levels of CVD risk about health behaviors strongly linked to CVD risk, including diet, physical activity, tobacco product use, and sleep. In addition, the need for prioritization in health behavior change counseling and consideration of psychological well-being and patients' use of technology has been described. Greater promotion of healthy lifestyle behaviors represents a substantial opportunity to inform patients about the importance of a healthy lifestyle. For effective behavior change to be realized, more intensive

lifestyle counseling than typically occurs in clinical settings is required. Clinicians, however, play a key role in initiating the behavior change process, motivating patients to consider behavior change, and referring their patient to intensive lifestyle counseling/programs and specialized health care professionals. Greater attention to healthy lifestyle behaviors during each routine clinician visit will assist in advancing the cardiovascular health of the population.

## ARTICLE INFORMATION

The American Heart Association makes every effort to avoid any actual or potential conflicts of interest that may arise as a result of an outside relationship or a personal, professional, or business interest of a member of the writing panel. Specifically, all members of the writing group are required to complete and submit a Disclosure Questionnaire showing all such relationships that might be perceived as real or potential conflicts of interest.

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## Disclosures

### Writing Group Disclosures

Writing group member	Employment	Research grant	Other research support	Speakers' bureau/ honoraria	Expert witness	Ownership interest	Consultant/ advisory board	Other
Penny M. Kris-Etherton	Pennsylvania State University	None	None	None	None	None	None	None
Kristina S. Petersen	Texas Tech University	None	None	None	None	None	None	None
Jean-Pierre Després	VITAM - Centre de recherche en santé durable (Canada)	Canadian Institutes of Health Research (CIHR) (1 grant PI, 4 grants co-investigator)†	None	None	None	None	None	None
Cheryl A.M. Anderson	University of California at San Diego	None	None	None	None	None	None	None
Prakash Deedwania	University of California at San Francisco School of Medicine	None	None	None	None	None	None	None
Karen L. Furie	Rhode Island Hospital	None	None	None	None	None	None	None
Scott Lear	Simon Fraser University Faculty of Health Sciences	None	None	None	None	None	None	None
Alice H. Lichtenstein	Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University Cardiovascular Nutrition Laboratory	None	None	None	None	None	None	None
Felipe Lobelo	Emory University, Rollins School of Public Health	None	None	None	None	None	None	None
Jun Ma	University of Illinois Chicago	NIHt; VAT; PCORIt	None	None	None	None	None	None
Pamela B. Morris	Self-employed	Esperion (local PI)*	None	None	None	None	Amgen*; Esperion*	None
Frank M. Sacks	Harvard T.H. Chan School of Public Health	None	None	None	None	None	None	None

This table represents the relationships of writing group members that may be perceived as actual or reasonably perceived conflicts of interest as reported on the Disclosure Questionnaire, which all members of the writing group are required to complete and submit. A relationship is considered to be "significant" if (a) the person receives \$10 000 or more during any 12-month period, or 5% or more of the person's gross income; or (b) the person owns 5% or more of the voting stock or share of the entity, or owns \$10 000 or more of the fair market value of the entity. A relationship is considered to be "modest" if it is less than "significant" under the preceding definition.

\*Modest.

†Significant.

**Reviewer Disclosures**

Reviewer	Employment	Research grant	Other research support	Speakers' bureau/honoraria	Expert witness	Ownership interest	Consultant/advisory board	Other
Karen E. Aspry	Brown University	None	None	None	None	None	None	None
Roger S. Blumenthal	Johns Hopkins University	None	None	None	None	None	None	None
Sandra B. Dunbar	Emory University	NIH NINR (Center grant for a P30 for which I am the Pilot Administrative Core Leader)*	None	None	None	None	Merck*	None
Amit Khera	UT Southwestern Medical Center	None	None	None	None	None	None	None
Eldrin F. Lewis	Stanford University	Novartis (clinical trial)†	None	None	None	None	Dal-Cort; Amgent	None
Connie White-Williams	University of Alabama at Birmingham	None	None	None	None	None	None	None

This table represents the relationships of reviewers that may be perceived as actual or reasonably perceived conflicts of interest as reported on the Disclosure Questionnaire, which all reviewers are required to complete and submit. A relationship is considered to be "significant" if (a) the person receives \$10 000 or more during any 12-month period, or 5% or more of the person's gross income; or (b) the person owns 5% or more of the voting stock or share of the entity, or owns \$10 000 or more of the fair market value of the entity. A relationship is considered to be "modest" if it is less than "significant" under the preceding definition.

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