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Better Population Health Through Behavior Change in Adults A Call to Action

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The American Heart Association (AHA) has adopted a bold new strategy in framing its 2020 goals: “By 2020, to improve the cardiovascular health of all Americans by 20% while reducing deaths from cardiovascular diseases and stroke by 20%.”¹ By medically treating cardiovascular risk biomarkers and the disease itself, clinicians played a major role in achieving the AHA’s 2010 goal to reduce coronary heart disease, stroke, and risk by 25%.¹ Now, however, with direct annual cardiovascular disease–related costs projected to triple, from \$272 billion in 2010 to \$818 billion in 2030,² economic realities necessitate a new approach. To avoid bankrupting the healthcare system, we must improve the distribution of cardiovascular health levels across the population by preserving cardiovascular health from childhood and by treating health risk behaviors to help more individuals improve their cardiovascular health into older ages. This heightened emphasis on preventing disease by addressing health behaviors leads to 3 novel emphases in the 2020 goals: (1) Preserving positive “cardiovascular health” by promoting healthy lifestyle behaviors; (2) treating

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unhealthful behaviors (poor-quality diet, excess energy intake, physical inactivity, smoking), in addition to risk biomarkers (adverse blood lipids, high blood pressure, hyperglycemia, obesity); and (3) a combination of individual-level and population-based health promotion strategies that aim to shift the majority of the public toward the next level of improved cardiovascular health.

The 7 metrics that define cardiovascular health (smoking, diet quality, physical activity level, body mass index, blood pressure, blood cholesterol, and fasting blood glucose) are each classified into 3 clinical strata (ideal, intermediate, and poor). Individuals with all 7 metrics at ideal levels are considered to have “ideal cardiovascular health.” However, the prevalence of ideal cardiovascular health is very low in the US population, and the prevalence of poor-quality diet, physical inactivity, and overweight/obesity is alarmingly high, presaging a worsening of the current distribution of health biomarkers.^{1–8} It is abundantly clear that cardiovascular health is being lost from childhood through young adulthood and that the major reasons are adverse health behaviors related to diet, physical activity, healthy weight maintenance, and smoking.⁸ These adverse health behaviors are most prevalent among those with low socioeconomic status, little education, and limited access to health care. The elimination of these health risk behaviors would make it possible to prevent at least 80% of heart disease, stroke, and type 2 diabetes mellitus, and even 40% of cancers.^{1,7,9,10} Given consistent evidence that healthful behavior changes are associated with improved levels of cholesterol, blood pressure, blood glucose, and medical outcomes, health risk behaviors warrant concerted intervention. The AHA’s 2020 goals were designed strategically to help all individuals (from all race and ethnic groups) prevent declines in their current health behaviors and take a step forward toward better cardiovascular health by progressing, as needed, from poor to intermediate or from intermediate to ideal healthy lifestyle behaviors.^{5,11} Although full implementation of the goals requires a life-course approach, beginning from childhood, we focus this call to action primarily on needed behavior change for adults.

The Evidence

As evidence that healthy lifestyle change is both necessary and attainable, we highlight the substantial bodies of research that link health behaviors with cardiovascular health and establish that health behavior change is feasible, improves health outcomes, and lowers healthcare costs.

The strong links between individual health behaviors and cardiovascular health were summarized in detail in the AHA’s 2020 strategic impact goals statement.¹ Subsequent prospective studies have demonstrated that the presence of ideal cardiovascular health behaviors and biomarkers is associated with longevity and freedom from cardiovascular and all-cause morbidity and mortality. Ford and colleagues⁵ observed that adults who had 5 of the 7 metrics at ideal levels, compared with 0 metrics, were at 78% lower risk for all-cause mortality and 88% lower risk for cardiovascular disease mortality over 5.8 years of follow-up. Similarly, over 14.8 years of follow-up, Yang and colleagues¹¹ observed a graded reduction in all-cause, cardiovascular disease, and ischemic heart disease mortality in conjunction with having greater numbers of metrics at ideal levels at baseline, which

suggests that substantial proportions of deaths could be prevented or postponed with greater achievement of ideal cardiovascular health. Higher numbers of ideal health metrics were also associated with lower cancer mortality.¹¹ Likewise, over 20 years of follow-up, adults in the Atherosclerosis Risk in Communities Study who had higher numbers of either health behaviors or biomarkers at ideal levels had dramatically lower cardiovascular disease event rates, and results were similar for blacks and whites.⁴

Findings from the Coronary Artery Risk Development in Young Adults (CARDIA) study demonstrate that young adults aged 18 to 30 years with healthy behaviors grow up to become older adults with lower biological risk.¹² Among those who practiced all of 5 healthy lifestyle behaviors in young adulthood (nonsmoking, low or no alcohol use, healthy diet, physically active, maintenance of normal weight), 60% had all ideal cardiovascular biomarkers in middle age. In contrast, of those who practiced none of these healthy behaviors in young adulthood, fewer than 5% reached middle age with all cardiovascular biomarkers at ideal levels.¹² Moreover, highlighting the promise of behavior change, those who did not have a healthy lifestyle at baseline but began to practice healthy behaviors later still had higher rates of ideal cardiovascular biomarkers than those who never adopted healthy behaviors. These results indicate that regardless of timing, the adoption of a healthy lifestyle has value for cardiovascular health.¹²

The old folklore that “behavior can’t be changed” has been dispelled by numerous randomized controlled trials of effective behavioral interventions.^{13–23} A number of federal agencies’ practice guidelines based on this evidence advise clinicians to either provide or refer patients to receive counseling in health behavior change.^{17–19,24,25} Findings confirm modest but significant impacts of brief physician advice or intervention on smoking cessation, improved dietary quality, and increased physical activity.^{14,15,19,22–27} These small lifestyle changes, as they accrue over time, can yield substantial improvements in the population’s cardiovascular disease morbidity and mortality.²⁸ Greater improvement in health behaviors is produced by intensive behavioral treatments, that is, those that incorporate multiple counseling sessions, each lasting 10 minutes.^{18–20,22–24,29–31} To treat obesity and improve diet quality, the US Preventive Services Task Force endorses and the Patient Protection and Affordable Care Act mandates coverage without copayments only for intensive behavioral intervention, because evidence of effectiveness is insufficient for less intensive interventions.²⁴

Conjoint use of high-risk and population strategies is essential to optimize cardiovascular outcomes and healthcare costs.^{5,32–34} To demonstrate this principle, Milstein and colleagues³⁵ used a dynamic simulation model of the US health system that tested the impact of 3 potential strategies to reduce deaths and lower costs: Expanded health insurance coverage, increased delivery of high-value preventive and chronic care, and promotion of healthier behavior and environments. The model showed that when added to a simulated scenario that included expanded coverage and improved care, health promotion could save 90% more lives and reduce costs by 30% in 10 years. That same investment could, by 25 years, save 140% more lives and reduce costs by 62%.³⁵ In sum, high-risk patients need both medical and intensive behavioral treatments that initially add cost but keep patients from progressing to a state that requires more expensive medical treatments or

hospitalization. The promotion of healthier behavior to those in the lower-risk categories through less intensive behavioral intervention and environmental change takes longer to produce a benefit but gradually slows the growth in chronic disease prevalence and lowers costs by reducing the demand for expensive care.

Shifting the population toward healthier behaviors will require time and systems support at the institutional, financial, and policy levels. We call on practitioners to encourage patients toward healthy lifestyle change, while recognizing that many systems changes needed to facilitate provision of such counseling are not under the clinician's control. Consequently, we also call on the healthcare system, insurance companies, employers, and educational institutions to institute policies that align to help shift all sectors of the population toward a healthier lifestyle.

Behavior Change Counseling in Practice

Clinicians play a vital role in fostering healthier behaviors. The fact that >80% of adults have a usual source of healthcare services gives providers tremendous reach.³⁶ Moreover, most individuals trust their provider's advice, and the patient-provider relationship is longitudinal, which enables follow-up over an extended period of time.²⁴

The 5 A's is a comprehensive, unified, validated treatment algorithm to facilitate health behavior change counseling efficiently within the constraints of the medical visit.^{13,18,19,22} The framework delineates 5 counseling steps that a provider can complete in several minutes: (1) **Assess** the risk behavior, (2) **advise** change, (3) **agree** on goals and an action plan via shared decision making, (4) **assist** with treatment, and (5) **arrange** follow-up.³⁷ A 5 A's approach has been shown to produce significant changes in a variety of health behaviors, including smoking cessation, dietary change, and physical activity.^{13,26,38-44} However, despite evidence of effectiveness and federal guidelines that recommend use of the 5 A's, behavioral counseling is not delivered to patients consistently.^{21,22} Limited visit time, competing medical priorities, and insufficient financial incentives for health promotion all create barriers.⁴⁵ However, progress has been made, and for both obesity and smoking, a majority of providers now perform the first 2 A's: Assess the risk behavior and advise behavior change.⁴⁶⁻⁴⁸ In contrast, only a small minority continue on to agree on goals, assist with treatment, and arrange follow-up,^{22,47,48} and it is these latter, less frequently performed 3 A's that have the greatest impact on healthful behavior change.^{22,47-51}

Many providers say they omit the last 3 A's because they perceive them as time consuming and feel they lack the needed counseling skills.^{52,53} At the heart of effective counseling is a patient-centered approach, whereby providers collaborate and partner with patients, helping them create plans to reach their own goals.^{26,54,55} Motivational interviewing, originally developed to treat alcohol abuse, is a specific form of patient-centered counseling that has also been applied successfully to foster health behavior changes.⁵⁴⁻⁵⁷ Even without a formal motivational interview, though, providers' use of patient-centered communication strategies improves individuals' confidence and success in changing health behaviors.^{26,41,51} The core counseling strategy is to avoid commanding language and instead to ask open-ended questions and use reflection to express empathy (taking an active interest in the patient's

perspective). The clinician first learns what action steps an individual is willing to take and then helps the patient to develop a behavior change plan. By partnering with patients, the provider supports them in assuming the responsibility to improve their own health.

Although they represent a brief, low-intensity approach, the “assist” and “arrange” steps are particularly impactful because they connect patients with the intensive intervention that many need to change health risk behaviors. Intensive behavioral treatments that include more sessions and more active components are well established to produce greater behavior change than interventions with lower intensity.^{21,22} Weight loss and weight loss maintenance, physical activity, diet quality, and smoking cessation outcomes all improve with added treatment sessions, and smoking cessation improves further with the addition of medications to assist in quitting.^{21,22} Modification of these unhealthy habits challenges patients to acquire skills in self-monitoring, use of behavioral reinforcers, and problem solving, for which expert and peer support are especially beneficial.

Many physicians find that equipping patients with behavioral skills is too tall an order to add to an already jam-packed medical encounter. Fortunately, the movement toward a patient-centered medical home aims to address that challenge. The distribution of care across an integrated, interprofessional team of providers should enable all to work at the top of their training and expertise. Several allied health professions (eg, clinical health psychologists, dietitians, kinesiologists, health educators) have specialized training and expertise in health behavior change. The addition of these experts to the interprofessional healthcare team either by physical colocation, distance consultation, or engagement in staff training can help to achieve higher-quality, more cost-effective care.^{57–63}

An effort to connect patients with health-promoting influences in their immediate environment also is needed, especially because patients spend ≈ 5000 of their waking hours annually out of contact with any healthcare provider.^{64,65} Support can take the form of helping patients find and connect to neighborhood resources (eg, park district or community center programs, biking trails, farmers’ markets). It will undoubtedly also take the form of answering patients’ questions about which of an armory of computer programs, applications, sensors, and online communities they should use to support healthy lifestyle changes. Providers will want to become informed about these new technologies, particularly because only a tiny fraction of them have undergone testing for efficacy or harms.^{66–68} Table 1 lists effective clinician behavior change strategies, as adapted from Artinian et al²² and others.^{37–42}

Healthcare Systems to Support Health Behavior Change

Even the most well-intentioned clinician can be thwarted if the healthcare system in place is unhelpful or obstructive. Because providers cannot manage what they do not measure, practical tools are needed to assess health behaviors. Many electronic medical records systems now have fields for tobacco use and body weight, although consistency and accuracy of their use are variable. Assessment of physical activity and dietary behaviors remains more challenging and still traps providers between 2 poor options: Practical but poorly validated brief assessments, or impractical but better-validated long self-report scales

and objective measures. The wherewithal to develop more satisfactory alternatives exists, because item response methodology and computer adaptive testing could support the development of brief, psychometrically sound tests that can be administered online.⁶⁹ Moreover, a helpful reimbursement precedent for technology-mediated assessment was established when the Centers for Medicare & Medicaid Services chose to provide reimbursement for a 3-minute mental health screening delivered by *mym3*, a downloadable application.

To date, healthcare systems improvements are more advanced for efforts to control tobacco compared with obesity, poor diet, or physical inactivity. For example, once the US Preventive Services Task Force concluded that provider training about smoking cessation counseling and pharmacological treatment improved the success of patients' attempts to quit smoking,²¹ medical centers developed in-person and online training programs in which providers could earn certification in tobacco treatment. Also, The Joint Commission on Accreditation of Healthcare Organizations first required smoking cessation counseling as a performance measure for pneumonia, heart failure, and myocardial infarction hospital admissions⁷⁰ and then added smoking cessation counseling as a quality criterion for excellence. These measures were successful in increasing counseling,⁷¹ although effects on tobacco use are just beginning to be studied.⁷² Recently, The Joint Commission announced plans for a requirement to assess smoking and offer cessation counseling to all hospitalized patients.⁷³

Similar systems are starting to emerge for obesity. For example, the Centers for Disease Control and Prevention sponsors a Diabetes Training and Technical Assistance Center that offers training in evidence-based intensive treatment for obesity.³¹ In comparison, very little has been done at the healthcare system level to incorporate specific provider training or quality performance measures related to diet or physical activity. Expansion of current healthcare systems approaches that target tobacco control and an aggressive extension of similar systems and strategies that address adiposity, diet quality, and physical activity are urgently needed.

Allied health professionals can extend the medical team's expertise in health behavior change if reimbursement policies are revised to support their effort. They can help train existing members of the medical staff (eg, medical assistants and nurses) in behavior change strategies and can disseminate training to community programs. Tobacco quit lines,⁷⁴ YMCA-based Diabetes Prevention Program treatment,⁶⁰ and peer educator-led Diabetes Prevention Program treatment⁵⁹ are all examples of effective programs that were originally developed by behavior change professionals and then effectively implemented in the community. Table 2 itemizes specific changes in the healthcare system that can support and sustain clinician-driven efforts to foster healthy lifestyle change.^{63,75–80}

Conclusion and Call to Action

Intervening to achieve sustained improvements in tobacco use, obesity, poor-quality diet, and physical inactivity is feasible and will improve patients' health. Both individual clinical and population-level strategies need to be implemented synergistically to reduce the high

prevalence of these risk behaviors in the population (Table 3). The AHA encourages the community of healthcare providers to do 2 things. The first is to intervene directly and as members of an interprofessional healthcare team to help individual patients adopt healthier lifestyles. Providers' efforts to champion a healthy lifestyle as the norm and healthy behaviors as the default in people's lives are critical. The second is to advocate for healthcare system and policy improvements to address the behavior change needs of the entire population more effectively.

An effective healthcare system to improve cardiovascular health by fostering healthy lifestyle change may resemble a 2-tiered, stepped care model.⁸¹ In the first service tier, clinicians provide low-intensity 5 A's intervention to all patients with low and moderate levels of cardiovascular risk. In the second service tier, the interprofessional healthcare team collaborates, drawing in community- and technology-based resources as needed, to provide intensive behavioral intervention to those at moderate and high levels of risk. Support for these endeavors needs to be available from all healthcare professionals and systems, particularly because the goal is to promote healthier lifestyles that reduce risk for all chronic disease.

Appendix

Disclosures

Writing Group Member	Employment	Research Grant	Other Research Support	Speakers' Bureau/Honoraria	Expert Witness	Ownership Interest	Consultant/Advisory Board	Other
Bonnie Spring	Northwestern University	NIH [†] ; Proteus [†]	None	None	None	None	Actigraph [*] ; Alere	None
Judith K. Ockene	University of Massachusetts Medical School	National Cancer Institute [†]	None	None	None	None	None	None
Michael D. Brown	Temple University	None	None	None	None	None	None	None
Lora E. Burke	University of Pittsburgh	NIH [†]	None	None	None	None	None	None
Debbie L. Cohen	University of Pennsylvania	NIH [†]	None	None	Witness for defense for a nephrology case [*]	None	None	None
Samuel S. Gidding	Nemours Foundation	None	None	None	None	None	None	None
Donald Lloyd-Jones	Northwestern University	None	None	None	None	None	None	None
Dariusz Mozafarian	Brigham and Women's Hospital/Harvard School of Public Health	NIH [†] ; Genes and Environment Initiative at Harvard School of Public Health [†] ; Gates Foundation/World Health Organization [†] ; GlaxoSmithKline; Pronova; Searle Scholar Award from the Searle Funds at the Chicago Community Trust [†] ; Sigma Tau	None	Aramark [*] ; the Chicago Council [*] ; International Life Sciences Institute [*] ; Norwegian Seafood Export Council [*] ; Nutrition Impact [*] ; SPRIM [*] ; Unilever [*] ; Food and Agricultural Organization of the United Nations [*] ; US Food and Drug Administration [*] ; World Health Organization	None	Harvard has filed a provisional patent application that been assigned to Harvard, listing Dr Mozafarian as a coinventor for use of transpalmitoleic acid to prevent and treat insulin resistance, type 2 diabetes mellitus, and related conditions [*] ; royalties from UpToDate for an online chapter	Foodminds [*]	None
Shirley Moore	Case Western Reserve University	AHA [†] ; NIH [†]	None	None	None	None	VA [†]	None
Milagros C. Rosal	University of Massachusetts Medical School	None	None	None	None	None	None	None
Dorothea K. Vafiadis	American Heart Association	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 (1) the person receives \$10 000 or more during any 12-month period, or 5% or more of the person's gross income; or (2) 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
Linda J. Ewing	University of Pittsburgh	None	None	None	None	None	None	None
Elizabeth Goodman	Massachusetts General Hospital	None	None	None	None	None	None	None
Kristen Hairston	Wake Forest University	None	None	None	None	None	None	None

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Table 1**Summary of Effective Clinician Approaches to Help Individuals Adopt Healthier Behaviors**

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- Implement the 5 A's: (1) **Assess** the risk behavior, (2) **Advise** change, (3) **Agree** on an action plan, (4) **Assist** with treatment, and (5) **Arrange** follow-up
 - Adopt a patient-centered approach: Ask open-ended questions; avoid commanding language; help patients create plans to reach their own goals
 - Help to increase patients' self-efficacy (confidence) about being able to change behavior by encouraging specific, attainable goals and building on successes
 - Ask patients to self-monitor behavior(s) targeted for change by using a paper or Web-based diary or a mobile application
 - Encourage use of rewards or incentives that reinforce attainment of behavioral goals
 - Advise accessing social support from family, friends, and community programs
 - Encourage seeking support from a behavior change specialist as needed
 - Schedule regular follow-up (in-person, telephone, and/or electronic) to assess progress
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Table 2**Summary of Healthcare Systems Approaches to Support Health Behavior Change**

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- Ongoing training of provider teams on health behavior targets, evidence-based behavior change strategies, and relevant ethnic and cultural tailoring of treatment
 - Practical tools to assess key health behaviors
 - Electronic health record systems that help assess, track, and report on health behaviors for individual patients and entire practices and that link providers to current guidelines
 - Electronic systems that schedule and track initial and follow-up visits for health behavior change
 - Integrated systems and reimbursement policy to support coordinated care by multidisciplinary provider teams (eg, including physicians, nurse practitioners, medical assistants, clinical health psychologists, dietitians, exercise specialists, social workers, and health educators)
 - Restructuring of practice goals and quality benchmarks to incorporate effective dietary, physical activity, tobacco, and adiposity interventions and targets
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Table 3

Key Points

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- Implement individual patient strategies and support population strategies to improve cardiovascular outcomes
 - Assess and track health behaviors, including smoking, weight, diet, and activity, over time electronically
 - Collaborate with an interprofessional healthcare team to help patients adopt healthier lifestyles through delivery of behavior change counseling
 - Engage community resources and technologies to support health behavior change
 - Support reimbursement of intensive behavioral counseling for patients whose poor health habits put them at cardiovascular risk
 - Advocate for healthcare systems and public health policies that prevent the loss of healthful behaviors over the lifespan and that address the behavior change needs of the entire population
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