

Medical Training to Achieve Competency in Lifestyle Counseling: An Essential Foundation for Prevention and Treatment of Cardiovascular Diseases and Other Chronic Medical Conditions

A Scientific Statement From the American Heart Association

A healthy lifestyle is fundamental for the prevention and treatment of cardiovascular disease and other noncommunicable diseases (NCDs). Investment in primary prevention, including modification of health risk behaviors, could result in a 4-fold improvement in health outcomes compared with secondary prevention based on pharmacological treatment.

The American Heart Association (AHA) emphasized the importance of lifestyle in its 2020 goals for cardiovascular health promotion and disease reduction. In addition to defining “cardiovascular health” based on criteria for blood pressure and biochemical markers (lipids and glycemia), the AHA Strategic Planning Committee further identified lifestyle characteristics of central importance: nutrition, physical activity, smoking, and maintenance of a healthy body weight.¹ The World Health Organization estimated that ~80% of NCDs could be prevented if 4 key lifestyle practices were followed: a healthy diet, being physically active, avoidance of tobacco, and alcohol intake in moderation.² To support healthy lifestyle initiatives, major changes are necessary at the societal level to improve population health. Numerous strategies might help to create a culture that promotes and facilitates healthy behaviors, including creating laws and regulations, mounting large-scale public awareness and education campaigns, implementing local community programs, and providing individual counseling.³ Physicians are uniquely positioned to encourage individuals to adopt healthy lifestyle behaviors: Approximately 80% of Americans visit their primary care physician at least once a year. Physicians directly communicate with their patients during clinical encounters across numerous settings, and research indicates that patients highly value recommendations provided by their physicians.^{4,5}

However, data further indicate that lifestyle counseling does not routinely occur in physicians’ offices, thereby representing a lost opportunity. Physicians report that they perform lifestyle counseling during ~34% of clinic visits.⁴ Patients, in turn, report an even lower frequency of physician lifestyle counseling. For example, obese patients reported receiving physical activity and dietary counseling from their primary care providers during ~20% and 25% of clinic visits, respectively,⁶ despite clear evidence and clinical guidelines.⁷ Even more worrisome is the downward trend in this type of counseling, as reported by *Healthy People 2010* analyses that indicated a 10% decrease in frequency of preventive counseling between 1996 to 1997 and 2007 to 2008.⁸

Many factors contribute to this situation. Physicians report they lack the necessary knowledge about how various diet and physical activity regimens affect specific medical conditions. Many doctors also say they lack the competencies needed to perform lifestyle counseling effectively.⁹ Although a large and convincing body of scientific evidence supports the benefits of a healthy diet, physical activity, and nonsmoking in NCD prevention and management, dissemination of this knowledge during medical training and continuing medical education is marginal compared with the time and

Marie-France Hivert, MD, MMSc, FAHA, Chair
 Ross Arena, PhD, PT, FAHA
 Daniel E. Forman, MD
 Penny M. Kris-Etherton, PhD, FAHA
 Patrick E. McBride, MD, MPH, FAHA
 Russell R. Pate, PhD, FAHA
 Bonnie Spring, PhD, FAHA
 Jennifer Trilk, PhD
 Linda V. Van Horn, PhD, FAHA
 William E. Kraus, MD, FAHA
 On behalf of the American Heart Association Physical Activity Committee of the Council on Lifestyle and Cardiometabolic Health; the Behavior Change Committee, a joint committee of the Council on Lifestyle and Cardiometabolic Health and the Council on Epidemiology and Prevention; the Exercise, Cardiac Rehabilitation, and Secondary Prevention Committee of the Council on Clinical Cardiology; and the Council on Cardiovascular and Stroke Nursing

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CLINICAL STATEMENTS AND GUIDELINES

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resources devoted to pharmacological treatment.^{10,11} Consequently, physicians feel ill prepared and lack confidence to provide adequate lifestyle counseling in the domains of physical activity, nutrition, weight management, and tobacco use.^{12,13}

Another important barrier to lifestyle counseling is that physicians are often skeptical about their patients' receptivity to such advice, believing that "patients won't change anyway," and that lifestyle counseling, therefore, is not worth the time required,¹⁴ despite literature showing that physicians' advice is effective in encouraging patients to change behaviors.¹⁵ Finally, limitations in time during clinical encounters and low or nonexistent reimbursement for lifestyle counseling also negatively impact a physician's perspective about the value of this practice.

The importance of a healthy lifestyle in preventing and treating NCDs is indisputable.¹ Simultaneously, NCD incidence and prevalence are increasing globally as a greater proportion of the world's population engages in unhealthy lifestyle behaviors.^{16–19} A culturally sensitive change is needed to improve public health, one that positively affects future medical practice by embracing the importance of healthy lifestyle promotion, counseling, and follow-up. This change in culture requires strong support at the societal level in the form of policies, public health actions, and key changes in the healthcare system and prerequisite education for providers. Such a paradigm shift begins with medical education and adequate training. Medical schools have the opportunity to shape global health by incorporating lifestyle medicine as part of future physician preparation to practice medicine in the 21st century. The AHA is committed to supporting the transformation of medical education to achieve this goal.

The goal of this scientific statement is to provide guidance in defining fundamentals in medical education and training needed for future physicians to be proficient in lifestyle medicine. This writing group acknowledges that curricular design varies among medical schools and that a "one size fits all" model for lifestyle medical education is not practical or advantageous. This scientific statement focuses on key learning objectives (also referred to as *learning outcomes* in recent literature) that can be implemented as each medical school deems appropriate.

PREVIOUS STATEMENTS AND RECOMMENDATIONS

In 2004, the Institute of Medicine (IOM) published a report entitled "Improving Medical Education: Enhancing the Behavioral and Social Science Content of Medical School Curricula."²⁰ The IOM underscored the importance of training physicians in behavioral and social sciences domains, with a specific focus on health-risk behaviors and principles of behavior change. At about the

same time, the United Kingdom's General Medical Council proposed that medical practitioners being trained for the new century should "know about, understand, and be able to apply and integrate the clinical, basic, behavioral, and social sciences on which medical practice is based."²¹ These recommendations shifted behavioral and social science knowledge from the "nice to know" category to the "need to know" category, along with clinical and basic sciences.²²

The Association of American Medical Colleges (AAMC) periodically publishes recommendations about preclinical skills that should be included in the medical curriculum.²³ One of the major competency goals (No. 10) is "Understand and apply preventative, curative, and palliative strategies for common diseases." In the detailed description of preventative clinical interventions, one of the key goals featured is "lifestyle alteration." In 2011, the AAMC released a report entitled "Behavioral and Social Science Foundations for Future Physicians"²⁴ that is consistent with IOM and Royal College of Physicians and Surgeons of Canada recommendations.²⁵ The AAMC emphasized the need for behavioral sciences training to help physicians address many current healthcare challenges and highlighted the importance of behavioral determinants in the management of multiple morbidities and premature mortality. Specifically, the report emphasized, "The urgent challenge in this aspect of medical education is not in knowing what content to teach, but in knowing how to create a learning environment that will support these lessons."²⁴ In addition, the report recommended that 2 main areas with important behavioral implications be incorporated into the medical education model: (1) lifestyle risk factor assessment and management and (2) motivational interviewing for conditions such as weight management and eating disorders, tobacco use, and substance abuse. The objective for learning outcomes that students should achieve by graduation was defined as follows: "Provide patient-centered behavioral guidance and explain the appropriate theoretical model that supports the approach."²⁴

The Liaison Committee on Medical Education is the accrediting body for US and Canadian medical schools. The Liaison Committee on Medical Education periodically releases recommendations for updating the content and format of medical school curricula to ensure that students acquire the necessary knowledge and skills to successfully pass the national medical boards required to practice medicine. The 2015 release of "Functions and Structure of a Medical School" included the following point as the first content objective (7.1): "The faculty of a medical school ensure that the medical curriculum includes content from the biomedical, behavioral, and socioeconomic sciences to support medical students' mastery of contemporary scientific knowledge and concepts and the methods fundamental to applying them to the health of individuals and populations."²⁶ In the more

detailed description of that specific objective, the requisite components were listed, which included prevention, health maintenance, nutrition, and communication skills, among many others.²⁶

The first national Lifestyle Medicine Think Tank was held on September 9 and 10, 2013, in Greenville, SC. Sponsored by the Josiah Macy Jr. Foundation and cohosted by the University of South Carolina School of Medicine Greenville and Harvard's Institute of Lifestyle Medicine, the Think Tank explored how best to integrate lifestyle medicine competencies into US medical school curricula. Representatives from the American College of Sports Medicine, National Institutes of Health (NIH), American Medical Association, Association of American Medical Colleges, National Board of Medical Examiners, Bipartisan Policy Center, and other key stakeholders created a vision, goals, and strategies²⁷ that were presented in October 2013 at the Bipartisan Policy Center public meeting, Teaching Nutrition and Physical Activity in Medical School: Training Doctors for Prevention-Oriented Care.¹⁰

To support these enhancements, 2015 ushered in a change in the Medical College Admission Test (MCAT), a prerequisite for admission to US medical schools.²⁸ A new subtest was added entitled "Psychological, Social, and Biological Foundations of Behavior." The subtest evaluates 5 domains: ways in which people perceive and react to the world; factors that influence behavior and behavior change; factors that influence how we think about ourselves and others; ways in which culture and social differences influence well-being; and ways in which social stratification affects access to resources.²⁹ This change in the MCAT will ensure that students enter medical training with a foundational knowledge of the behavioral and social sciences, as has long been required for biology, chemistry, and mathematics.²⁹

However, despite the modification to the MCAT and recommendations from the IOM, the AAMC, the Liaison Committee on Medical Education, and national leaders in the field, few medical schools currently devote any portion of their curriculum to lifestyle counseling and promotion of healthful behaviors to prevent or manage NCDs. The following section summarizes recent and ongoing efforts to incorporate these components into US medical school curricula.

US MEDICAL SCHOOLS: STATUS OF CURRICULUM CONTENT RELATED TO TRAINING FOR LIFESTYLE COUNSELING FOR HEALTH MAINTENANCE, PREVENTION AND TREATMENT OF CARDIOVASCULAR DISEASES, AND OTHER NCDs

In 1992, the National Cancer Institute convened an expert panel that urged that training in effective smoking

cessation and prevention programs become a required component of undergraduate medical education in all US medical schools by 1995.^{30,31} The brief physician counseling approach that was recommended for training was a variant of the 5 A's intervention that has proved effective for treating many chronic disease risk behaviors, which the US Preventive Services Task Force continues to endorse today. The approach delineates 5 counseling steps that a provider can complete in a few 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.^{32,33} Considerable progress has been made, and most medical school programs now do train students in tobacco intervention using a variety of methods. Additional improvement would involve integrating tobacco treatment across all years of the curriculum, addressing cultural diversity in beliefs and use patterns, and discussing alternative nicotine delivery channels (eg, e-cigarettes).³⁴ Because medical student education to date has been best developed for tobacco intervention, we devote greater attention here to training in diet, physical activity, and behavior change strategies.

Over the past 2 decades, targeted NIH programs have facilitated the integration of behavioral sciences and nutrition training into the medical school curricula, yet relatively little targeted support has been provided for inclusion of the science of physical activity. In this section, we present a summary of national awards for enhancing medical education and give a few examples of leading medical schools that have integrated behavioral, nutrition, or physical activity sciences and counseling skills as part of their curricula. We mention postgraduate opportunities for lifestyle medicine training and provide links to detailed information about both MD and postgraduate programs. We also provide an overview of institutional and student program evaluations regarding lifestyle concepts and skills training included in US medical school curricula.

Behavioral Sciences

In an effort to enact the IOM recommendations on social and behavioral sciences, in 2006, the NIH funded 9 US medical schools through a K07 mechanism and renewed the funding of 8 original awardees in 2012. The intent was to support curriculum enhancement in social and behavioral sciences in undergraduate medical education. Each funded institution identified a partner medical school to which it would disseminate its curricular enhancements, allowing for the evaluation of dissemination activities. Although their specific educational foci differed, all of the awardees addressed how to incorporate behavioral and social science content throughout all 4 years of medical school in both the preclinical and clinical curricula.³⁵ Some of the curricular improvements

involved incorporating biopsychosocial and interactive approaches to patient care that stress a holistic and culturally sensitive approach that involves the development of empathy, communication, and teamwork skills, with a particular focus on patient safety and promotion of lifelong habits of self-directed learning and self-care. Over the initial 5-year funding period, ~6100 medical students experienced the curricular innovations,³⁵ and as of 2011, the collaboration had completed 200 dissemination activities.³⁶ Institutions used a variety of methods (eg, curricular mapping and qualitative and quantitative assessments) to evaluate the effectiveness of these innovations. The executive summary describing the impact of the NIH K07 Behavioral and Social Science Consortium for Medical Education for each awardee school is available publicly.³⁶ As one leading example, the University of California, San Francisco redesigned its undergraduate medical curriculum and offered a program that integrates social, behavioral, and biomedical science education in an early and sustained way. Themes woven throughout the core curriculum include behavior change, health disparities, biopsychosocial modeling, the culture(s) of medicine, clinical reasoning and communication, professional development, the physician-patient relationship, medical ethics, genetics, and geriatrics. The University of California, San Francisco faculty has become adept at translating the implicit values and vocabularies in the cultures of medicine versus social and behavioral sciences across the different pedagogical approaches.

Nutrition

Over the past 15 years, there have been notable efforts to incorporate nutrition in medical education. The Nutrition Academic Award (NAA) program supported by the NIH (mainly the National Heart, Lung, and Blood Institute but also the National Institute of Diabetes and Digestive and Kidney Diseases) funded 10 medical schools in 1998 and 11 additional schools in 2000 to incorporate nutrition as a required part of the medical curriculum.^{37,38} Schools were encouraged to integrate the scientific basis for nutrition as it relates to health and disease and to provide practical clinical nutrition-related experiences in their regular curricula. A list of awardee schools, descriptions of their programs, and examples of instructional materials and practice tools are available online.³⁹ Each medical school was required to have the endorsement of its dean, not only to implement the nutrition curriculum during the time of the award but also to sustain this component subsequently. Although the NAA program saw variability in the format and extent of the nutrition educational content in the medical curricula, participants showed a strong commitment to the fundamentals of the NAA goals.

The NAA succeeded in achieving its purpose regarding the integration of nutrition education within the required medical school curriculum in 21 medical schools.³⁷ These investigators also developed a syllabus that remains on the National Heart, Lung, and Blood Institute website; however, with the cessation of funding on completion of the award period, the syllabus has not been updated but continues to offer topic areas that remain generically relevant to the role of nutrition within medicine. Individual NAA medical schools have perpetuated medical nutrition education to various degrees.^{40,41} Despite the cessation of the NAA funding, many (but not all) NAA schools have progressed in their approaches to medical nutrition education, with an overarching goal of sustaining the importance of and need for nutrition in medical practice.³⁷ Among non-NAA schools, there appears to have been little or no recent enhancement of medical nutrition education.⁴² On the basis of unpublished data from nutrition education surveys, gaps in nutrition education coverage continue to widen. In 2000, 35% of US medical schools reported requiring a dedicated nutrition course; however, in 2004, this percentage decreased to 30%, then 25% in 2008, and 18% in 2012 (M. Kohlmeier, MD, PhD, personal communication email, March 26, 2015, and presentation at the New England/Mid-Atlantic Regional Nutrition Educators Meeting, Boston, MA, March 2015). Among medical schools that required a dedicated nutrition course in 2012, 53% had a clinical practice component that specifically addressed nutrition (with an average of 6.5 hours of instruction).⁴³

Physical Activity and Exercise

Currently, there appears to be a lack of national attention to physical activity and exercise assessment and counseling in the medical education model. No national awards have been proposed to formally incorporate content related to the assessment, counseling, or tracking of physical activity in medical school curricula, despite its clear importance in health maintenance, prevention, and management of NCDs.

In a study by Connaughton et al,⁴⁴ only 10% of medical school deans polled (72 schools) believed that their students were proficient at providing an exercise prescription, and only 6% of medical curricula had a core component or mandatory course that addressed exercise prescription. Only a few medical schools include the concept, "exercise is medicine." For example, the University of South Carolina School of Medicine Greenville applies a systems-based approach to integrate exercise and lifestyle medicine education throughout all 4 years of the undergraduate medical curriculum²⁷: Evidence-based curricular resources are used to seamlessly integrate exercise physiology (in particular, the "Exercise is Medicine" knowledge, skills, and abilities) into the curricular modules and are taught as an integral component of all

organ systems. Students learn to understand and synthesize the physiological evidence-based mechanisms that prevent and treat NCDs, as well as how to improve their communication skills with patients regarding lifestyle medicine counseling.

Postgraduate Programs and Continuous Medical Education

In addition to the critical role of medical schools in teaching the fundamentals of behavioral sciences, tobacco use, nutrition, and physical activity to future physicians, opportunities for postgraduate training during residencies and fellowships are essential, as is continuing medical education. We believe that all primary care-based residencies and most specialties would benefit from incorporating a lifestyle component into their training programs. As physicians in training progress with their clinical proficiencies, their interactions with patients reinforce the need for expertise in lifestyle counseling rooted in a strong knowledge base. The American College of Lifestyle Medicine offers a list of postgraduate programs that have an emphasis on lifestyle.⁴⁵ Most programs listed are in primary care and internal medicine. The American College of Lifestyle Medicine also provides a list of institutions that offer certificates or graduate programs for non-MDs who wish to complete programs related to lifestyle and preventive medicine.⁴⁵

With the recent interest in the rising incidence of chronic NCDs, continuing medical education programs for practicing physicians also are emerging. A leading example involves 2-day workshops and online materials offered by the Institute of Lifestyle Medicine through Harvard Medical School's Department of Continuing Education.⁴⁶ Also, the American College of Preventive Medicine has recently released a 30-hour comprehensive lifestyle medicine course via online webinars.⁴⁷

These few existing programs only begin to fill the gap created by the lack of lifestyle training during medical school. The development of more postgraduate programs in the future will allow practicing physicians to complement the fundamentals acquired during medical school by acquiring behavior modification competencies to help them support patients' efforts toward initiation and maintenance of a healthy lifestyle.

CURRENT STATUS ON LIFESTYLE COUNSELING EDUCATION IN US MEDICAL SCHOOLS: GLOBAL PORTRAIT AND PROGRAM EVALUATION

To emphasize the importance of prevention in medical training, Dr Ronald M. Davis, President of the American Medical Association, reported that although most of the schools (124 of 125 surveyed in academic year

2006–2007) included prevention or health maintenance in their curricula, the average time devoted to this aspect of medicine was a meager 23 hours over the 4 years of training. Dr Davis also stressed that programs were not devoting adequate time to skill building in counseling techniques, such as motivational interviewing. He stated, "It is no surprise that the medical students feel ill prepared to counsel and are pessimistic," and he advocated that a minimum of didactic lessons plus interactive skills-building sessions (including role-playing patient scenarios) should be required in every medical school.

As academic institutions, medical schools continually evaluate the integration of new programs into their curricula. A systematic literature review was performed to characterize programs designed to teach medical trainees about counseling for behavior change and to determine program effectiveness.¹¹ The review evaluated 106 educational programs (98 from the United States). Most were offered during residency programs (mainly internal medicine, family medicine, and pediatrics), and only one-third were offered in preclinical training years. The primary aim of most programs was to improve communication skills. The lifestyle topic most often targeted was smoking cessation (n=67), whereas other behaviors were less often included (nutrition [n=30] and physical activity [n=22]). Total time devoted was ≤8 hours in 58% of the programs evaluated. Programs were based on didactic lectures (n=58) and small working groups (n=71), observation of patient interviews (17 simulated/video and 11 with real patients), and practical work (42 with peers, 32 with standardized patients, and 28 with real patients). The authors concluded that the highest-quality programs were based on a theoretical framework for counseling (such as motivational interviewing principles), and they observed that most of these categorized "high-quality" programs were focused on smoking cessation. They also highlighted that successful programs usually included a combination of approaches, such as didactics, role-playing, and motivational interviewing. They suggested that a systems approach that includes both providers and patients in the training program would be a very strong and promising model for lifestyle medicine education.

Curricula Evaluation by Medical Students

Every year, graduating medical students are surveyed by the AAMC about their perception of the quality of their medical school program. Questions cover a wide range of topics. In the 2013 survey, when graduates were asked to rank from 1 to 4 how well their study of certain sciences prepared them for clinical clerkships and electives, behavioral sciences were ranked 3.2, comparable to microbiology and neurosciences but lower than pathophysiology and clinical medicine (3.5). However, another question as to whether their instruction was in-

adequate, appropriate, or excessive in a series of broad and specific topics included no specific mention of aspects of lifestyle counseling such as nutrition or physical activity. In the section that inquired about the degree of confidence to perform different skills, the communication section failed to list motivational interviewing or behavioral counseling. Given the lack of specific questions about these topics in the students' surveys, it is not possible to assess how well prepared medical school graduates feel to perform lifestyle counseling in their future clinical practice. Future student surveys should include questions about nutrition, physical activity, and behavioral counseling skills to assess the quality of medical education and raise awareness among program directors about the priority of these topics in their curricula.

In summary, few medical school curricula offer a comprehensive program to train future physicians to perform competent lifestyle counseling for the prevention and management of NCDs. Most of the "high-quality" theoretical-based programs have focused on smoking cessation, and the majority of schools have integrated tobacco as a topic in their regular curriculum. National awards were given to a few schools for inclusion of nutrition or behavioral sciences in their curricula, but no similar awards have been issued to expand the nutrition programs or to integrate physical activity into the medical school curriculum.

RECOMMENDATIONS FOR INTEGRATION OF FUNDAMENTALS TO LIFESTYLE COUNSELING IN MEDICAL SCHOOL CURRICULUM

The pace of advances and discoveries in medicine requires constant integration of new material into the long-standing 4-year medical education model, which creates ongoing curriculum challenges regardless of the importance of the new knowledge to clinical practice. These challenges require school-specific tailoring, and we, therefore, believe that it would be unrealistic to propose a rigid and detailed list of objectives. Thus, we propose general educational objectives related to behavioral sciences and the main lifestyle components (ie, physical activity, nutrition, and tobacco use) known to have major impacts on general health and the likelihood of developing NCDs. Adopting an active lifestyle, a healthy diet, and nonsmoking status are all part of the AHA's definition of ideal cardiovascular health but are also determinants of many other chronic diseases, as well as general well-being. The recommendations listed in the following subsections are intended to provide a general framework for the design of a comprehensive program that would equip future physicians with the knowledge and skills necessary to play a vital role in the prevention and treatment of cardiovascular disease and other medical conditions and overall maintenance of general health.

Behavioral Sciences

Lifestyle counseling often requires knowledge of a wide and diverse set of skills and facts, for example, the scientific evidence for health consequences related to dietary saturated and *trans* fatty acids or the benefits of walking for treating claudication. Educating patients about scientific facts usually is insufficient to change behavior. For any targeted lifestyle change, physicians need a fundamental understanding of behavioral science principles, as well as skills to support their patients in the lifestyle change process, and the behavioral and social sciences offer a rich body of theory and evidence about how to help patients accomplish behavior change. Like other sciences, the behavioral sciences apply systematic methods and rules of interpretation that test the validity of common sense assumptions. In this manner, behavioral and social sciences have progressively accumulated a body of evidence that enables prediction and control of behavioral outcomes. Although behavior change principles may seem self-evident at first glance, they are derived from basic science research on learning. As Kaplan et al²⁹ suggested, teaching cognitive or behavioral interventions to students without a background in learning theory is analogous to teaching pathophysiology to students who have not been exposed to basic biological principles.

Here we briefly note several major conceptual frameworks that are reflected in contemporary behavioral science thinking. The principles described represent models, sometimes formalized as theories, characterizing the mechanisms that are thought to initiate and maintain behaviors and the pivot points that interventions can act on to optimize healthy lifestyle improvements. The ecological framework often has been proposed to consider cardiovascular disease risk behaviors and to characterize promising interventions targeted at the individual, sociocultural, and environmental or policy levels for each such behavior.⁴⁸ The individual, whose attitudes, beliefs, and habits many psychological interventions target, is embedded in a complex system that either promulgates or discourages heart-healthy behaviors. Individuals are nested within a sociocultural context in which others convey norms, models, reinforcement, and inclusion when behaviors match their expectations. At an even more macroscopic level, the physical environment and public policies establish defaults and options that facilitate or thwart healthy behavioral choice. Given multiple levels of influence on health behaviors, the expectation is that interventions would be maximally effective when they simultaneously and coherently target different levels in the system of causal influences on human behavior.

At the level of the individual, rewarded behaviors tend to be repeated, and cues that prompt expectations of rewards come to trigger craving and pursuit of those rewards. This mechanism operates in the same way for the person who craves a cigarette whenever he or she

has a negative mood or sees a friend who smokes as it did for Pavlov's dogs, which began to salivate when they heard a bell that signified the imminent arrival of meat. Primary reinforcers such as tobacco, other substances, and even appealing foods trigger the brain's reward circuitry quite directly, enabling contextual cues to ingrain behavioral habits that become very challenging to change.⁴⁹⁻⁵¹ The person who is trying not to smoke or overeat faces an ambivalent choice between responding to an immediately available, potent reward versus delaying gratification to stave off long-term adverse health consequences.⁵² Social cognitive theory, the dominant contemporary theory of health behavior, credits people with having cognitive and social resources to cope with such challenges.⁵³ Particularly when they are cloaked with social support to help buffer against stress, social cognitive theory construes individuals as thinking beings who benefit from observing others and building up skills and self-efficacy (confidence) that let them make choices that are in their own best health interests, rather than being entirely driven by evolutionarily primitive brain reward centers.⁵³

We present learning objectives that represent the fundamental concepts and skills for behavioral approaches that future physicians should acquire during their training in Table 1. Programs should include both knowledge of fundamental concepts from behavioral science theories and opportunities to develop and practice the skills

Table 1. Learning Objectives for Behavioral Sciences Knowledge and Skills Development During Undergraduate Medical Training

Domains	Learning Objectives
Knowledge	Describe counseling steps that foster behavioral change
	Describe a patient-centered approach and core concepts of major behavior change theories
	Recognize the expertise of the behavioral counselor and distinguish health professionals who have expertise in supporting specific types of lifestyle behavioral change
Skills	Assess lifestyle behaviors and patients' confidence and readiness to make changes
	Demonstrate effective patient-centered communication skills to help the patient set behavior change goals and establish a plan
	Use appropriate behavior change techniques, such as goal setting, self-monitoring, and reinforcement, to support patients in making healthy lifestyle changes
	Appropriately adapt counseling to patients' age, sex, race or ethnicity, culture, and preferences
	Refer to a behavioral counselor or other healthcare professionals with behavioral expertise when appropriate

necessary for the eventual clinical delivery of effective behavioral support. Skills can be introduced by use of simulation or role-playing between students, standardized trained patients, and real patients. Adequate supervision by behavioral specialists or trained clinicians is considered a primary component of this training to enhance progression of students.

The centerpiece of effective behavioral counseling is a patient-centered approach, whereby providers collaborate with patients to help them create plans to reach their own goals.⁵⁴⁻⁵⁶ Motivational interviewing is a specific form of patient-centered counseling originally developed to treat substance abuse that also has been applied successfully to foster health behavior changes.^{56,57} The core counseling strategy is to avoid commanding language and instead to ask open-ended questions and reflect back the patient's perspective, to express empathy. Motivational interviewing gives the patient a structured way to recognize and resolve the very ambivalence that is at the heart of the challenge of health behavior change. The physician's job is to highlight and help the patient experience the discrepancy between personal core values and health-compromising behaviors that are inconsistent, albeit easy and pleasurable. After learning what action steps an individual is willing to take, the clinician helps the patient to develop a behavior change plan and assume the responsibility to improve his or her own health.

A simpler approach that we mentioned previously is called the 5 A's algorithm: (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.^{32,33,58} The 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.^{54,59-61} Unfortunately, the full approach is not commonly used in current practice. A majority of providers now perform the first 2 A's (assess and advise), but few complete the process with the subsequent 3 A's. Indeed, many providers say they omit the last 3 A's because they feel they lack essential counseling skills,¹⁴ which supports the recommendation that the medical curriculum provide more adequate practical training in behavioral skills. Physicians also point to lack of time, insufficient reimbursement, and other clinical priorities as explanations for limited behavioral counseling.

Physicians should be aware of the existence of allied healthcare professionals with training in behavioral counseling (eg, clinical health psychologists) or specific lifestyle-domain expertise (eg, registered dietitians, exercise physiologists, and physical therapists) and know when to refer patients who would benefit from additional support. It is important to recognize that the more intensive (longer duration, multiple sessions) interventions implemented by clinical health psychologists are held to the same evidence-based practice standards applied

to evaluate treatments in clinical medicine.^{62,63} When systematically appraised according to the hierarchy of evidence, intensive behavioral treatments for smoking, obesity, and healthy diet show efficacy as good as or better than pharmacological alternatives and are often particularly effective when used in combination.^{62,64}

Behavioral science concepts and skills can be applied to any type of behavior modification, but knowledge and practice in specific lifestyle areas increase physicians' confidence and performance. The next subsections describe in more detail the recommended learning objectives for healthy eating, physical activity, and smoking cessation.

Nutrition

The importance of nutrition in medicine has been recognized formally and valued for decades.⁶⁵ There is no debate that a healthy diet and eating behaviors are central to health and well-being and that health professionals should be cognizant of these facts^{66,67}; however, current evidence suggests that physicians do not feel adequately prepared to assume a prominent role in counseling their patients about good nutrition practices.⁴² They indicate that they lack knowledge of nutrition science and the skills needed to apply nutrition interventions.

Experts in the field of nutrition and medical education have provided detailed lists of objectives and topics relevant to medical education.^{66,67} In September 2012, the National Heart, Lung, and Blood Institute, in collaboration with the NIH Office of Disease Prevention and the Division of Nutrition Research Coordination, convened a meeting on implementation of nutrition across the continuum of training from medical school through residency, and in the training of other healthcare professionals as well. The objectives of the meeting were to recommend (1) the content and implementation of nutrition and healthy lifestyle education, training, and competency testing and (2) the integration of nutrition education, training, and research to improve population health, patient care, and health outcomes. A core article and companion articles that describe the need for nutrition education in training medical doctors and other healthcare professionals were subsequently published.⁶⁷⁻⁷¹

Table 2^{72,73} provides the framework and global learning objectives for the nutrition knowledge and skills recommended by this writing group as part of medical training curricula of US medical schools. The learning objectives were adapted from the nutrition care process in collaboration with registered dietitians and registered dietitian nutritionists. The nutrition care process guides clinical practice for registered dietitians and registered dietitian nutritionists and is designed to provide a consistent and systematic approach for critical thinking and decision making to provide optimal patient care.⁷³ Adams and colleagues⁶⁶ previously proposed a detailed list of nutrition competencies for physi-

Table 2. Learning Objectives for Nutritional Assessment and Counseling During Undergraduate Medical Training

Domains	Learning Objectives
Nutrition assessment	Describe health benefits of recommended dietary patterns and current dietary guidelines for maintenance of health and for the prevention and treatment of diverse medical conditions
	Assess dietary behaviors and evaluate patients' habitual food intake
	Recognize the need for detailed nutritional assessment and referral to RDs and other healthcare professionals with nutritional expertise when appropriate
Nutrition diagnosis	Describe pathogenesis of nutrition-related diagnoses
	Diagnose nutrition-related problems and prioritize them
	Recognize and use diagnostic labels for documentation in patients' medical records
	Communicate effectively with RDs, including understanding the information conveyed by the "problem, etiology, signs, and symptoms" statements commonly used by RDs
Nutrition intervention	Assess patients' confidence and readiness to change toward a healthy lifestyle behavior that includes good nutritional practices
	Counsel patients on the benefits of evidenced-based recommended nutrition practices for the prevention and treatment of diverse medical conditions
	Use appropriate behavioral skills and tools to help patients initiate and maintain good nutritional practices
	Demonstrate effective communication skills with patients and other healthcare professionals with nutritional expertise
	Appropriately counsel patients according to age, sex, race or ethnicity, culture, and other personal characteristics
	Recognize the need and appropriate timing for referral to RDs or other healthcare professionals with nutrition expertise with the intent of modifying a nutrition-related behavior
	Support the implementation of the nutrition intervention with members of the healthcare team
Nutrition monitoring and evaluation	Facilitate goal setting and periodic evaluation of dietary recommendations
	Support behavioral changes by advising the use of monitoring tools in achieving nutrition-related goals
	Evaluate the health effects of nutrition modifications made by patients

RD indicates registered dietitian.

cians and encouraged physicians, registered dietitians, and registered dietitian nutritionists to work collaboratively to implement nutrition care process domains. Essential domains include nutrition assessment, nutritional diagnosis, nutrition intervention, and nutrition monitoring and evaluation. We have purposely kept similar domain names but have summarized and simplified the learning objectives in our recommendations (Table 2^{72,73}). It is important that physicians understand the role of nutrition assessment in clinical care, which ranges from a more behaviorally oriented assessment in outpatient settings to a highly specific, detailed, and quantified assessment in inpatient settings, especially for those patients requiring nutrition support. Building from the nutrition assessment domain, the nutrition diagnosis identifies the key nutrient/dietary behavior/eating patterns that potentially influence the diagnosed medical problem. With respect to nutrition intervention, medical students can develop their knowledge about the diet interventions that are appropriate for a given patient and the skills needed for dietary counseling. Nutrition monitoring and ongoing evaluation are essential for updating, intensifying, and encouraging patient eating behaviors that support the ideal nutritional status for a given diagnosis and medical condition. At any point during the process, physicians should recognize when a referral to a registered dietitian, registered dietitian nutritionist, or other qualified nutrition expert is needed for more intensive assessment, counseling, or therapy. Physicians must also ensure ongoing communications among the interdisciplinary team involved in patient care when such referrals are made.

Physician training and education in nutrition can be achieved in a variety of ways. Given the time challenges associated with the already burgeoning medical school curriculum, we encourage the incorporation of nutrition knowledge within existing disease-based and life cycle modules. Skill-based competency development likewise should be integrated within the curriculum to allow medical students sufficient opportunity to practice nutrition assessment and counseling skills. Program development and coordination strongly benefit from the inclusion of a qualified registered dietitian or registered dietitian nutritionist, nutrition faculty, or physician nutrition specialists.⁷⁴

Physical Activity

The high prevalence of physical inactivity in the United States, as well as globally, has been documented consistently. Only 21% of US adults currently meet the 2008 federal physical activity guidelines for both aerobic and strength training.⁷⁵ Even more concerning, objective measurements of physical activity levels by accelerometry demonstrated that only 8% of US adolescents met recommended levels of physical activity.⁷⁵ In adults, being physically inactive equates to a substantially higher risk for premature morbidity and mortality. In fact, physical inactivity is the fourth-leading cause of death worldwide.⁷⁶

This troubling statistic is compounded by the fact that approximately one-third of the world's population is not meeting minimal recommendations for physical activity,⁷⁶ which indicates that deaths attributable to a physically inactive lifestyle will continue to be a significant concern.

Given the abundance of scientific evidence concerning physical activity and exercise in the medical field, the list of specific knowledge objectives could be exceedingly lengthy. As mentioned above, this scientific statement is not intended to give a detailed list of specific objectives but rather to provide general learning objectives that this writing group advocates be incorporated into medical school curricula. The proposed objectives recommended by this writing group are listed in Table 3⁷⁷ and follow general performance domains similar to the ones proposed by the American College of Sports Medicine⁷⁸ but with simplified learning objectives that are likely amendable to most medical school curricula.

Assessment of physical activity includes a basic history, questionnaires, or logs but could be complemented by diverse current and upcoming technological tools (eg, pedometers and personal tracking devices and systems) and sometimes the need for referral for more comprehensive testing (eg, stress test), either for safety or optimal workload for fitness improvement.^{79,80} Exercise prescription can be performed verbally or in writing with various levels of details depending on the situation and physician preference. The behavioral strategies are similar to the general concepts provided previously but targeted toward adoption or maintenance of an active lifestyle. At any point, physicians must be aware that they can refer their patients to allied healthcare professionals (eg, physical therapists, exercise physiologists, and kinesiologists) who can help them to be more active and have the expertise to develop and administer a supervised exercise plan and follow-up in the appropriate situation. As suggested by the National Physical Activity Plan⁸¹ and the American College of Sports Medicine,⁷⁸ physicians should be personally aware of and engaged in an active lifestyle not only for their own health benefits but also to serve as role models for their patients.

Each medical school should have the flexibility to choose optimal methods for integration of the learning objectives within its own curriculum to support students in attaining proficiency in physical activity counseling. Faculty responsible for developing didactic content on physical activity, exercise assessment, and counseling should be competent in this area. Ideally, they should have an academic degree in a field closely related to exercise science. In instances in which content and skills are integrated into problems or modules, faculty should receive the appropriate training to highlight the key points related to physical activity. It would be unrealistic to expect that all involved faculty have an exercise specialty. For clinical training that targets physical activity assessment and counseling, practicing physicians who oversee the clinical

Table 3. Learning Objectives for Physical Activity and Exercise Assessment and Counseling During Undergraduate Medical Training

Domains	Learning Objectives
Physical activity assessment	Describe the normal physiological responses to an acute bout of exercise and adaptations to aerobic and resistance exercise training
	Describe health benefits of physical activity for health maintenance and in diverse medical conditions, as well as recommended guidelines for an active lifestyle
	Assess physical activity behaviors using the appropriate tools for patients who are healthy, have controlled disease, or are living with a disability
	Recognize the need for additional assessments such as symptom-limited exercise testing and refer to appropriate healthcare professionals or clinical settings
Physical activity and exercise prescription	Recognize individuals who do not meet current physical activity recommendations
	Develop a safe physical activity or exercise prescription for apparently healthy people, those at increased risk for developing a chronic noncommunicable disease, and patients with specific medical conditions
	Recognize individualized constraints/risks and contraindications to performing physical activity or a structured exercise program and adjust recommendations accordingly
Physical activity and exercise counseling, behavioral strategies	Assess patients' confidence and readiness to change toward a healthy lifestyle behavior as it relates to physical activity and exercise
	Counsel patients on the benefits of physical activity in health maintenance and for prevention and treatment of specific medical conditions
	Use appropriate behavioral tools and skills to support patients to initiate or maintain a physical activity plan
	Demonstrate effective patient communication skills with regard to physical activity and exercise assessment and counseling in all clinical settings
	Appropriately counsel patients according to age, sex, race or ethnicity, culture, and other personal characteristics
	Recognize the need for individualized or supervised physical activity programs when referring a patient to appropriate healthcare professionals with physical activity or exercise expertise
	Support the implementation of the physical activity intervention in close collaboration with other members of the healthcare team
	Use behavioral strategies to maintain an active lifestyle, including monitoring, goal setting, and periodic reassessment
	Evaluate the health effects of physical activity modifications with patients and reinforce or adjust the plan accordingly
Physician's personal health	Recognize the importance of an active lifestyle for his or her own quality of life, professional balance, and as a role model for patients

exercises of medical students and are responsible for assessing and honing skills should demonstrate proficiency in this area through their own clinical practice activities, specialized training, instructional responsibilities, or research interests. The involvement of nonphysician clinicians who have training and expertise in physical activity, exercise assessment, and counseling would further enrich the educational experiences of medical students in the clinical setting. The use of an interprofessional education model is effective in improving educational outcomes and fosters a deeper appreciation of other disciplines.^{14,15} Involving other healthcare professionals in medical student training in the clinical setting can be achieved by (1) having medical students participate in a formal experience in a rehabilitation setting, such as cardiac rehabilitation, or (2) integrating other healthcare professionals in the physician-run setting (eg, primary care clinic) to supervise, mentor, and assess medical students' proficiency in physical activity, exercise assessment, and counseling.

There are numerous guidelines, position statements, and textbooks related to physical activity, exercise assessment, and counseling that can be used for medical student education. The American College of Sports Medicine "Guidelines for Exercise Testing and Prescription," now in its ninth edition, is considered a leading source of information related to physical activity and exercise.⁷⁸ Other relevant textbooks and resources can be found on the American College of Sports Medicine website.⁸² The AHA also has numerous scientific statements and guidelines on this topic and is an excellent resource for medical students, residents, and practicing physicians. In particular, the 2013 publication entitled "Exercise Standards for Testing and Training" is an excellent comprehensive resource.⁸⁰

Smoking

Most curricula include information about the adverse health effects of smoking and the importance of smoking

cessation. Many have sessions for teaching a rapid 5 A's-type counseling approach that has demonstrated positive outcomes.^{32,54,83} In addition to the standard tobacco exposure assessment and smoking cessation training that is typically included in a medical school curriculum, we present in Table 4 a few additional points that reflect the complexity of tobacco-related behavior counseling that physicians should know.

Because the tobacco industry is creatively and constantly marketing new products, physicians must stay abreast of them to complete their assessment and be able to answer questions that patients have about other sources of tobacco (eg, cigarillos, chewing tobacco, or e-cigarettes). Secondary and even tertiary tobacco exposure is associated with adverse health outcomes.^{84–86} With growing pharmacological options for smoking cessation, physicians should know the effectiveness of each option and potential side effects. One consideration often overlooked is the fact that psychological support (in person, over the phone, or online) is successful both alone and in combination with pharmacological aids.⁸³ Behavior strategies are similar to the general concepts described previously, keeping in mind that smoking is an addiction with strong physical and psychological components, and consequently, what is best for each patient could differ according to their level and type of dependence.

The content of a tobacco-related program in the medical school curricula can be introduced in system-based modules, logically often with cardiopulmonary themes. Medical school curricula should include practical behavior counseling sessions. Often, tobacco cessation is one of the first behaviors targeted, because in addition to being a potent risk behavior, it is perceived to be more straightforward and simpler than nutrition or physical activity counseling. The 5 A's algorithm,³² described in Behavioral Sciences, is a simple and successful approach often selected by medical school programs based on strong scientific evidence and the recommendation of the US Department of Health and Human Services Public Health Service.^{62,87}

Other Behaviors

Many other behaviors influence health and NCD risk and could be addressed in a medical school curriculum depending on each program's preference, time, and desire to be comprehensive. For example, sleep patterns are of interest because they are associated with risk of obesity, diabetes mellitus, and cardiovascular disease.^{88,89} Difficulty sleeping and insomnia are among the most frequent complaints in primary practice, and physicians should be familiar with strategies to address these in ways other than pharmacotherapy. Stress management is another important health concern associated with reduced quality of life, and stress is related to many adverse health outcomes. Adequate physician training can

Table 4. Learning Objectives for Tobacco Exposure Assessment and Smoking Cessation Counseling During Undergraduate Medical Training

Domains	Learning Objectives
Tobacco exposure assessment	Assess smoking status and lifetime history of smoking, as well as use of other tobacco products
	Assess level of nicotine dependence
	Describe health hazards of tobacco exposure (primary and secondary) and benefits of tobacco cessation, including delay before time to benefits
Tobacco cessation prescription	Recommend effective tobacco cessation aids, pharmacological and nonpharmacological, based on best scientific evidence and public health recommendations
	Recognize the side effects and contraindications of pharmacological aids
Counseling, behavioral strategies	Assess patients' confidence and readiness to cease or reduce tobacco usage
	Demonstrate effective patient communication skills to engage in discussions about tobacco cessation
	Acknowledge that tobacco leads to an addiction with psychological and physical aspects and that tobacco cessation usually requires multiple attempts
	Help patients to use effective behavior change techniques to quit smoking or tobacco use, such as goal setting, self-monitoring, and positive reinforcement
	Adapt counseling appropriately to match the patient's age, sex, race or ethnicity, culture, values, and preferences
	Refer to group or individual support, phone/online quit smoking resources when appropriate

help to guide early recognition of the problem, enabling the physician to implement basic initial steps and provide referral in appropriate instances.

The benefits of mild to moderate alcohol consumption and the harms of excessive intake are a complex topic included in most medical school curricula and should continue to be integrated. Use and abuse of recreational drugs is another complicated topic, which often necessitates referrals to a specialized team of addiction professionals when it impedes normal functioning.

Number of Contact Hours

This writing group chose not to provide specific recommendations for the number of contact hours needed to

meet physical activity, nutrition, and tobacco use assessment and behavioral counseling objectives. Medical schools should have the flexibility to determine the number of contact hours needed to meet learning objectives. The number of contact hours should be sufficient to train physicians to be competent in lifestyle counseling. As successful models of comprehensive physical activity, nutrition assessment, and behavioral counseling training are implemented in medical schools, we will learn from leading programs and develop more definitive guidance on the number of contact hours needed.

Format

Although there is no single approach to the integration of lifestyle counseling into the medical education curriculum, we are of the opinion that integrating learning objectives into existing courses can reinforce messages and facilitate learning. We support an approach that includes diverse opportunities to provide physical activity, nutrition assessment, and behavioral counseling content throughout the curriculum and ensures that key concepts receive adequate time. Integrating the proposed objectives throughout the curriculum allows for a more in-depth educational experience and should allow time to be devoted to specific topics and skills, without putting content in silos. A good example of integration of behavioral sciences, nutrition, physical activity, and smoking is the Profession MD–Lifestyle program introduced at the University of Sherbrooke (Quebec, Canada) in 2008.^{90,91} The institution created a longitudinal program that included knowledge and skills for healthy lifestyle behavior support but also aligned the sessions with the system-based thematic modules, inserted specific points in the complex medical problem sets, and included practical clinical vignettes with standardized patients in the last preclinical semester.

Consistent with previous recommendations, we believe that programs should include a combination of didactic learning sessions, observations, and practical work with peers and in clinical settings. Novel approaches such as experiential learning also could easily be included to enhance programs. For example, it can be enlightening to have students set personal goals to modify one of their own lifestyle behaviors and go through the behavior change process. Other examples include self-monitoring their lifestyle (eg, dietary intake, physical activity, screen time, sleep pattern, alcohol intake) and organizing field trips to grocery stores, cooking classes, or physical activity sessions. Some of these examples require time, resources, and creative thinking for successful implementation. Examples of academic activities and formats to integrate lifestyle-related knowledge and skills development are provided in Table 5. Medical students should be able to translate knowledge regarding physical activity and nutrition assessment to behavioral counseling in different clinical settings. Moreover,

students should demonstrate an ability to appropriately modify their approach according to unique patient characteristics including age, sex, race, and ethnicity.

Special Considerations

Although the physiological benefits of physical activity, nutrition, and healthy lifestyle behaviors are significant regardless of sex, age, race, or ethnicity, the potential to achieve wellness goals could be affected by differing patient characteristics. Healthcare providers can be better trained to prioritize and target wellness concepts and to respond to patient idiosyncrasies that often complicate and even impede health goals. Sex, age, minority status (particularly with respect to race and ethnicity), and disabilities (eg, amputees and those with paraplegia or quadriplegia or learning or cognitive impairments) are among a long list of patient features that are relevant.

Individuals might experience different physical performance and health benefits in response to a specific physical activity because of differences in cardiovascular responses, body composition, or other physiological

Table 5. Examples of Delivery Format to Integrate Lifestyle Counseling Knowledge and Clinical Skills in Undergraduate Medical Schools Curricula

Domains	Examples of Formats
Knowledge	Large class lectures
	Small-group didactics
	Integration in problems (for curriculum based on problem-based learning)
	Self-based learning (readings, interactive e-quiz)
Clinical skills	Experimental learning experiences (self-monitoring, behavior modification)
	Observations of patients' interviews
	Video of simulated patients or real patients
	Patient interview performed by experienced clinician
	Observation/shadowing of other health professionals (dietitian, kinesiologist)
	Practical work
	Role-play with peers
	Practical work with standardized simulated patients
	Practical work with real patients
	Feedback from practical work
	From peers observing/experiencing counseling
	From trained standardized patients
From professor observing role-play or patient counseling	

attributes. Perhaps even more significant, deep-rooted feelings (eg, anxiety, fear, or even indifference) and perceptions about how exercise affects body image or social status can influence patients' desire and emotional capacity for physical activity. Nutrition practices can be similarly affected by patients' culture and personal contexts.⁹² The appeal of food types, taste, and quantities varies relative to each individual's upbringing, psychosocial dynamics, and other influences.⁹³ Diets endorsed primarily on the basis of medical attributes might not be easily initiated or sustained for many patients who would benefit, because the perception that foods have health benefits might simultaneously generate the perception that they are unappealing. Advertising and cultural norms that elevate the allures of tobacco and alcohol to people of diverse cultural backgrounds can have an impact that is not apparent to the clinician. Health education must better sensitize providers to these patient-centered perspectives and help healthcare providers develop skills to better navigate these clinical complexities.

Sex

Women derive similar cardiovascular benefit from physical activity as men,^{16,94} and possibly even greater non-cardiovascular benefit, such as mitigation of osteoporosis and depression.⁹⁵ Ironically, women are less likely (42.6%) to engage in regular physical activity than men (52.1%).⁸ Adolescence and early adulthood are particularly critical periods, when many girls stop or markedly decrease leisure-time physical activity.⁹⁶ Sex-related physiological differences (smaller heart size and reduced lean body mass)⁹⁷ are among the physiological attributes that contribute to reduced maximal exercise performance in women versus men.⁸⁰ In some instances, this can contribute to increased insecurity or disinclination to initiate or maintain regular physical activity. Perhaps even more significantly, some women have ingrained insecurities about their body image that affect exercise behaviors.⁹⁸

There are also sex differences in nutrition behaviors. Eating disorders are more common in women,⁹⁹ despite mounting evidence that they are often underdiagnosed in men.¹⁰⁰ Also, because many women are employed in the work force and might be the head of single-parent households, fewer meals are being prepared at home, with a consequent impact on the nutritional quality of diet. Physicians need to be mindful of this when assessing eating behaviors and making nutrition recommendations.

Pregnancy is a unique period when multiple physiological and psychological factors influence food intake behaviors, including nausea, food aversion, and social pressure to "eat for two" or "eat only the right things." Providing obstetric care requires nutritional knowledge and skills far beyond focusing on avoidance of specific foods (eg, supporting women to gain the appropriate gestational weight according to their prepregnancy body

mass index as recommended by the IOM).¹⁰¹ Women might experience additional emotional barriers to exercise during pregnancy.^{102,103} The rapid body transformation during pregnancy could exacerbate anxieties about body image and create additional stresses regarding the pregnancy itself. Physicians should be aware of physical activity recommendations in pregnancy but also should be mindful of the psychological aspects and the physical challenges of this period of life for women.

Sarcopenia, osteoporosis, and other age-related physical hindrances, including issues of multimorbidities and geriatric syndromes, also are more prevalent among older women than men. Adequate nutrition and an active lifestyle can prevent or diminish the impact of many of these age-related morbidities that are common in women, but older women are less physically active than older men, with 54% of men and 66% of women ≥ 75 years of age reporting that they do not engage in leisure-time physical activity.¹⁰⁴

Age

In general, people become less active as they grow older.¹⁰⁵ Poor nutritional status and food insufficiency are more common in frail older people and are not always reflected by a lower body mass index.¹⁰⁶ The implications are significant, because older adults are projected to constitute 20% of the US population by 2050.

Overall physical activity benefits are similar in older and younger adults,¹⁰⁷ with the added importance that being active can help moderate age-related physical decrements and thereby preserve independence, functional capacity, and quality of life in older people. In addition to aerobic training, strength, flexibility, and balance training are valuable components of an exercise program to more effectively achieve these goals.¹⁰⁸ Adequate nutrition is essential to maintain lean mass and good nutritional status.

Numerous physiological changes associated with older age bring challenges to the maintenance of functional independence and achievement of optimal nutritional status. For example, typical age-related changes in taste sensation contribute to age-related increases in salt affinity or appetite changes,¹⁰⁹ often leading to little diet variety, which might increase the risk of nutrient deficiencies. Cardiovascular capacities and muscular strength decrease in most aging individuals. In addition, many common morbidities of older age impede people from meeting physical activity goals and having adequate nutrient intake. Many elderly people (or their families) regard physical activity with increased apprehension; fears regarding cardiac instability are compounded by the risk of falls, incontinence, or musculoskeletal injury. Other common impediments, including cognitive changes, hearing or visual impairments, joint pain, dyspnea, and fatigue, limit many seniors from achieving a reliable physical activity routine. Changes in executive cognition can also

make healthful meal preparation more difficult.¹¹⁰ Many elderly people lack control of food choices because they live in residences with limited cafeteria menus or in multifamily houses. Polypharmacy can create challenges in achieving nutritional and physical activity goals, in part because of the side effects of drugs, such as fatigue, appetite suppression, or impaired taste.

Medical student training should devote attention to aging because it affects physical activity and nutrition practices. Moreover, although behavior modification can be challenging at any time of life, it is even more challenging as people age. Physicians should recognize the need for referral to other health specialists, such as registered dietitians or registered dietitian nutritionists and physical or occupational therapists, to support healthy lifestyle behaviors in older people.

Race/Ethnicity

Adherence to recommended physical activity, diet, tobacco use, or other lifestyle behaviors tends to vary among racial and ethnic subgroups. For example, blacks and Hispanics have low physical activity practices, with accompanying healthcare consequences.^{111,112} In some cultures, physical activity might evoke a sense of health or social value, whereas in others, it might be viewed as physical labor or menial transport.^{113,114} Similarly, nutrition is often related to ethnic orientation and cultural self-definition, with many finding comfort and emotional sustenance in foods high in salt, sugars, and fats. Alcohol consumption and tobacco use also can be community or culturally ingrained and hard to overcome, even with compelling medical advice.

In some instances, differences in race and ethnicity correspond to lower socioeconomic status,¹¹⁵ both as an origin of a behavior that becomes entrenched and as a behavior that is perpetuated by economic disparities.¹¹⁶ The well-established observation that health-risk behaviors are most numerous among the socially disadvantaged highlights the challenges associated with successfully addressing multiple unhealthy lifestyle habits among those who have the fewest resources to make positive behavioral changes. Understanding these dynamics can help providers target effective care by remaining cognizant of socioeconomic issues.^{117,118} Among these are the realities that fresh healthy foods usually cost more than processed or fast foods and that crime-ridden neighborhoods are often unsafe places for physical activity.

Finally, the advent of accountable care requires that the education of healthcare providers better foster capacities to target, implement, and support healthful self-care. Regular physical activity, good nutrition, and other healthy behaviors (eg, quitting smoking and limiting alcohol) are among the recommended lifestyle goals that can reduce mortality and morbidity and improve quality of life of all patients.

CONCLUSIONS

In this statement, we propose a framework for US medical school deans and program directors to integrate learning objectives that will improve lifestyle counseling competency among future physicians. Our intent is not to assert that physicians should know everything about behavioral sciences, nutrition, physical activity, and tobacco use as determinants of health and diseases, or to suggest that they become experts in all of those fields. Instead, we recommend that physicians become comfortable with engaging in conversations with their patients to initiate the behavior modification process, to make assessments, provide basic advice, and encouragement toward a healthy lifestyle, and to refer patients to other healthcare professionals in the appropriate situations. Many institutions are leaders in medical education for health behavior and lifestyle counseling, but wider implementation of lifestyle counseling education is needed nationally to ensure that future physicians are well prepared to address the main health issues of the 21st century. This AHA statement adds to recommendations from the AAMC and changes in the MCAT to support medical school administration in their curriculum (re)configuration. As often stated, “evaluation drives the curriculum”; consequently, changes in board certification will also be necessary to ensure real change across US institutions. Adequate training of physicians in lifestyle counseling is essential for the prevention and treatment of cardiovascular disease and other NCDs. Yet at the population level, we must not forget that we need to continue to foster public health messages and implement policies to create an environment that encourages our patients to adopt and maintain healthy behaviors that are discussed in the medical office. Achieving AHA’s 2020 goals will be possible if we invest in healthy lifestyle promotion, education, and interventions, from the population to the individual level. Physicians are key stakeholders as they oversee an individual’s care and serve as advocates in society to promote changes in legislation and in communities to promote population health.

FOOTNOTES

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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Writing Group Disclosures

Writing Group Member	Employment	Research Grant	Other Research Support	Speakers' Bureau/Honoraria	Expert Witness	Ownership Interest	Consultant/Advisory Board	Other
Marie-France Hivert	Harvard Pilgrim Health Care Institute/Harvard Medical School	None	None	None	None	None	None	None
Ross Arena	University of Illinois Chicago	None	None	None	None	None	None	None
Daniel E. Forman	University of Pittsburgh Medical Center	None	None	None	None	None	None	None
William E. Kraus	Duke University	None	None	None	None	None	None	None
Penny M. Kris-Etherton	Pennsylvania State University	None	None	None	None	None	None	None
Patrick E. McBride	University of Wisconsin-Madison Medicine	None	None	None	None	None	None	None
Russell R. Pate	University of South Carolina Exercise Science, Public Health Research Center	NIH†; CDC*; Duke Endowment†	None	None	None	None	None	None
Bonnie Spring	Northwestern University	None	None	None	None	None	None	None
Jennifer Trilk	University of South Carolina School of Medicine, Greenville	South Carolina Spinal Cord Research Foundation*; Ardmore Institute of Health (Foundation Grant for Implementing Lifestyle Medicine in Medical School)†	None	None	None	None	None	None
Linda V. Van Horn	Northwestern University	NIH (Maternal Offspring Metabolic Family Intervention Trial [MOMFIT])†	None	None	None	None	None	None

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*Modest.

†Significant.

Reviewer Disclosures

Reviewer	Employment	Research Grant	Other Research Support	Speakers' Bureau/Honoraria	Expert Witness	Ownership Interest	Consultant/Advisory Board	Other
Donna K. Arnett	University of Alabama at Birmingham	None	None	None	None	None	None	None
Brent Egan	University of South Carolina School of Medicine—Greenville	Medtronic†; Quintiles†	None	None	None	None	Medtronic*	UpToDate (author of hypertension components of UpToDate)*
Judith K. Ockene	University of Massachusetts Medical School	NIH†	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.

*Modest.

†Significant.

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Medical Training to Achieve Competency in Lifestyle Counseling: An Essential Foundation for Prevention and Treatment of Cardiovascular Diseases and Other Chronic Medical Conditions: A Scientific Statement From the American Heart Association

Marie-France Hivert, Ross Arena, Daniel E. Forman, Penny M. Kris-Etherton, Patrick E. McBride, Russell R. Pate, Bonnie Spring, Jennifer Trilk, Linda V. Van Horn, William E. Kraus and On behalf of the American Heart Association Physical Activity Committee of the Council on Lifestyle and Cardiometabolic Health; the Behavior Change Committee, a joint committee of the Council on Lifestyle and Cardiometabolic Health and the Council on Epidemiology and Prevention; the Exercise, Cardiac Rehabilitation, and Secondary Prevention Committee of the Council on Clinical Cardiology; and the Council on Cardiovascular and Stroke Nursing On behalf of the American Heart Association Physical Activity Committee of the Council on Lifestyle and Cardiometabolic Health; the Behavior Change Committee, a joint committee of the Council on Lifestyle and Cardiometabolic Health and the Council on Epidemiology and Prevention; the Exercise, Cardiac Rehabilitation, and Secondary Prevention Committee of the Council on Clinical Cardiology; and the Council on Cardiovascular and Stroke Nursing

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