

The National Physical Activity Plan: A Call to Action From the American Heart Association A Science Advisory From the American Heart Association

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The health benefits of regular physical activity and the relation between physical inactivity and chronic disease morbidity and mortality are well established. Also clear is the fact that efforts to increase physical activity at the population level will require collective action by government, nongovernment, for-profit, and nonprofit entities working together at the local, state, and national levels. The US National Physical Activity Plan (NPAP), developed by the National Physical Activity Plan Alliance, of which the American Heart Association (AHA) is a member, is designed to facilitate this collective action, to help organizations from all sectors of society work together to increase physical activity in all segments of the American population.

The purposes of this advisory are to summarize the data that describe the health benefits of regular physical activity and the public health burden of low levels of physical activity, to describe the NPAP and the role it will play in increasing population levels of physical activity, and to encourage readers of *Circulation* to join the AHA's efforts to promote its implementation.

Physical Inactivity: A Major Public Health Burden

As summarized in Table 1, there is substantial evidence supporting the benefits of regular physical activity to prevent a wide variety of disease conditions and to enhance quality of

life. Interestingly, there is less of an appreciation of noncardiovascular benefits of lifestyle physical activity and structured exercise, and this is an area of great opportunity for educating the public and healthcare practitioners.

Physical inactivity is rapidly becoming a major global concern and is the fourth leading cause of death worldwide.^{2,3} As noted by Kohl and colleagues, "In view of the prevalence, global reach, and health effect of physical inactivity, the issue should be appropriately described as pandemic, with far-reaching health, economic, environmental, and social consequences."⁴

According to estimates, physical inactivity increases the relative risk of coronary artery disease, stroke, hypertension, and osteoporosis by 45%, 60%, 30%, and 59%, respectively.⁵ Our inactive lifestyle contributes to ≈334 000 deaths each year in the United States and >5 million worldwide, making it 1 of the 10 leading global causes of death and disability.^{6,7} Epidemiological data also suggest that low levels of physical activity are associated with an increased risk of 25 chronic diseases.⁸ Using these data and other reports, the US Centers for Disease Control and Prevention identified physical inactivity, along with tobacco use and unhealthy nutritional habits, as a causal factor contributing to the 2 leading killers of all adults in the United States: coronary artery disease and malignant neoplasms.⁹

Studies have shown that sedentary behavior, a component of physical inactivity that is characterized by activities with an

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Table 1. The Health Benefits of Regular Physical Activity

Adults	Children and Adolescents
Strong evidence	
Lower risk of	Improved cardiorespiratory endurance and muscular fitness
Early death	Improved body composition
Coronary heart disease	
Stroke	Improved bone health
Type 2 diabetes mellitus and insulin resistance	Improved cardiovascular and metabolic health biomarkers
High blood pressure and hypertension	
Adverse atherogenic lipoprotein/lipid profile	
Features of metabolic syndrome	
Colon and breast cancers	
Weight gain	
Falls	
Depression	
Cognitive impairment	
Low cardiorespiratory fitness	
Moderate to strong evidence	
Better functional health	
Abdominal obesity and ectopic fat	
Moderate evidence	
Weight regain after weight loss	Reduced symptoms of anxiety and depression
Hip fracture	
Bone loss	
Sleep disturbances	
Lung and endometrial cancers	

Adapted from the *Physical Activity Guidelines Advisory Committee Report: 2008*.¹

energy expenditure <1.5 metabolic equivalents, such as sitting, especially over prolonged periods, is associated with a variety of metabolic diseases and higher rates of all-cause and cardiovascular mortality independently of alcohol consumption, cigarette smoking, and leisure-time physical activity.^{2,3,10–12} Most jobs require little or no physical activity, and the 50-year progressive decline in occupation-related energy expenditure has been proposed as a major contributor to the current obesity epidemic.¹³ In 2005, ≈24% of US adults reported no leisure-time physical activity,¹⁴ and only 31% met the Physical Activity Guidelines for Americans (moderate-intensity activity for ≥30 min/d for ≥5 d/wk).¹⁵ The phrase sedentary death syndrome has been proposed to highlight the emerging entity of sedentary lifestyle-mediated unhealthy conditions, almost all of which are classified as chronic diseases or their antecedent risk factors, that ultimately increase mortality.¹⁶

A World Health Organization report ranked physical inactivity fourth on a list of risk factors for noncommunicable chronic diseases, behind high blood pressure, smoking, and high blood glucose.¹⁷ Moreover, physical inactivity contributes to higher population-attributable risk than 2 of the risk factors

above it on the World Health Organization list: high blood pressure and high blood glucose. Because the World Health Organization report also is based primarily on self-reported leisure-time physical activity, which is prone to substantial misclassification, these data are probably an underestimate of the true effect of physical inactivity on the health of the world's population.¹⁸ The importance of physical inactivity as a cause of noncommunicable chronic diseases was also highlighted by a United Nations report¹⁹ that emphasized the importance of physical activity for all populations throughout the world. In addition to a high burden of excess mortality attributed to noncommunicable chronic diseases, associated sequelae include an adverse impact on families and substantial economic consequences.²⁰

Many factors may contribute to the low population rates of physical activity.²¹ For example, for decades, community planning efforts have not emphasized the construction of walking and biking routes for transportation and recreational venues. As a result, most people cannot walk or bike to the places they need to go every day (school, work, stores). According to the National Household Travel Survey, nearly all trips are now made by automobile.²² For children, changes in school curricula have reduced opportunities to be physically active, with many schools cutting or eliminating physical education or recess. In addition, for both adults and children, an increasing focus on inactive leisure time such as screen time rather than active leisure time has contributed to low population rates of physical activity. The effects of these factors are particularly alarming in light of the clear evidence of the health benefits of physical activity and the health risks of inactivity.

A 2005 survey conducted by the Kaiser Family Foundation (Menlo Park, CA) revealed that, on average, young people 8 to 18 years of age engaged in the following daily sedentary leisure-time activities: watching television (3 hours 51 minutes), using the computer (1 hour 2 minutes), playing video games (49 minutes), and reading (43 minutes). Accordingly, population-level efforts are urgently needed to implement successful activity programs to combat our increasingly hypokinetic environments.

As for adults, according to a telephone survey of 153 000 adults in the United States, only 3% adhere to 4 healthy lifestyle characteristics: not smoking, maintaining a normal body weight, eating adequate daily servings of fruits and vegetables, and exercising regularly.²³ The adherence rate was even lower in blacks than in whites at 1.4% and 3.3%, respectively. Almost 10% of the respondents adhered to none of these practices. Exemplifying the exercise adherence problem, walking is the most popular physical activity identified by adults,²⁴ but <7% of those whose primary exercise is walking are doing so at the amount (frequency, duration, and intensity) necessary to meet contemporary physical activity recommendations.²⁵

Efforts to Increase Population Levels of Physical Activity

To date, most efforts to increase physical activity have focused on individuals or specific settings (schools, workplaces, churches). The US government has issued physical activity guidelines for all Americans.¹⁵ These efforts, although important, are not

Table 2. Hypothetical Activities During a Typical Workday (16.5 Waking Hours) for a Person Engaging in a Regular Exercise Program

Period/Activities	Time, h
Morning (6:30 AM–noon)	
Structured exercise (treadmill walking)	0.75
Eat breakfast*	0.50
Shower, shave, dress	0.75
Drive to work*	0.50
Work on computer*	2.00
Have meetings*	1.00
Total	5.50
Afternoon (noon–6 PM)	
Lunch*	0.75
Have meeting with associates*	1.00
Work on computer*	2.50
Review business proposal/report*	0.50
Return telephone calls, correspondence, e-mails*	0.75
Drive home*	0.50
Total	6.00
Evening (6–11 PM)	
Pick up dry cleaning, groceries	1.00
Eat dinner*	0.75
Read newspaper*	0.50
Watch television, read, check e-mail*	2.00
Telephone calls*	0.25
Review mail, pay bills online*	0.50
Total	5.00
Night (11 PM–6:30 AM)	
Sleep	7.50

*Sitting opportunities (potential chair time). This hypothetical “modern-day man” spends ≈91% of his waking hours sitting. However, because he walks briskly on his home treadmill at a slight incline, 5 d/wk, current guidelines classify him as physically active. The term habitually sedentary exerciser is probably more appropriate.

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sufficient to increase physical activity at the population level (Table 2).²⁶ Achieving this goal will require altering the physical and social environments in which Americans work, play, learn, and travel.¹⁴ Meeting physical activity guidelines is almost impossible when people live, work, and attend school in contemporary environments that discourage or are not safe for walking, biking, and bodily movement throughout the day. Modifying these environments so that they are permissive and safe for physical activity requires policy changes at the local, state, and national levels and the cooperation of a wide range of organizations from all sectors of society.^{27,28}

What Is the NPAP?

In response to the need for a national and multifaceted effort to increase physical activity in the United States,²⁹ the NPAP was launched in 2010 as a comprehensive set of policies, programs, and initiatives aimed at increasing physical activity in all segments of the American population.³⁰ Major objectives

of the NPAP are to improve health, to prevent disease and disability, and to enhance quality of life for all Americans by creating a national culture that supports physically active lifestyles.

The NPAP provides 231 recommendations for policy and best practices to facilitate change across 8 distinct societal sectors that should lead to more Americans being more physically active where they live, work, and play. These 8 societal sectors are business and industry; education; health care; mass media; parks, recreation, fitness, and sports; public health; transportation, land use, and community design; and volunteer and nonprofit. White papers were written for each of these sectors by international experts, and these papers are available on the NPAP website (www.physicalactivityplan.org). This approach involving these 8 sectors allows the NPAP to reach diverse audiences and encourages the development of a wide range of innovative activities. Each sector has strategies aimed at promoting physical activity, with specific reference to tactics that communities, organizations and agencies, and individuals can use to achieve their objectives. The full NPAP can be reviewed at www.physicalactivityplan.org.

The NPAP was designed to complement the 2008 Physical Activity Guidelines for Americans.¹⁵ The Physical Activity Guidelines for Americans describe the types and amounts of physical activity needed to provide health benefits, whereas the NPAP presents recommendations that, when implemented, will change communities in ways that should result in many more Americans meeting the activity recommendations in the Physical Activity Guidelines for Americans. Similarly, the Physical Activity Guidelines for Americans establish behavioral goals for individuals, and the NPAP presents strategies for attaining these goals in varied societal environments.

The NPAP was developed by a coalition of private, non-profit organizations working in close cooperation with federal agencies, including the US Centers for Disease Control and Prevention. By design, the NPAP is not an official government document or agency but was developed with financial and in-kind personnel support from key government agencies.³⁰ The AHA was one of the first organizations to commit support for the development of the NPAP, and many AHA volunteers contributed to the planning process. AHA Chief Executive Officer Nancy Brown participated in the press event on May 3, 2010, that launched the NPAP, at which she issued the following statement: “Americans need a motivational push from all sectors of society to get on their feet and reverse a growing trend of physical inactivity.”¹⁵

Making a Difference in the Healthcare Sector: Should Healthcare Providers Be Doing More?

According to the US Preventive Services Task Force, there is growing evidence of the efficacy of behavioral health counseling in the healthcare setting.^{31,32} Given the well-established benefits of structured exercise regimens and regular physical activity, numerous studies have shown that brief healthcare provider counseling during an office visit can play a critical role in patients adopting varied preventive lifestyle interventions.³³ For physical activity promotion to be successful in healthcare settings, public health professions should ensure that healthcare providers have the skills

and resources necessary to effectively counsel patients on the benefits of regular physical activity. Researchers should prioritize the development and implementation of programs that will increase healthcare providers' capacity to deliver physical activity recommendations and strategies to promote collaboration between multiple sectors to promote physical activity. Furthermore, evaluation of such programs is vital to establish effective strategies for the promotion of physical activity in the healthcare setting.

One example is the Exercise is Medicine (EIM) initiative, which calls for healthcare providers to promote patient engagement in physical activity. The American Medical Association and the American College of Sports Medicine colanched EIM in 2007. EIM is coordinated by the American College of Sports Medicine, which has since worked closely with the healthcare sector of the NPAP. The goal of EIM is for healthcare providers to review and assess every patient's physical activity level, with office visits concluding with an exercise prescription or referral to a qualified health and fitness professional for further counseling.

EIM focuses on how to translate physical activity research into healthcare practice and to encourage further supportive evidence of the ability of physical activity to prevent and treat chronic disease. EIM can be thought of as promoting 5 major efforts that will support and buttress attainment of the AHA's Impact Goals for 2020 and the US Healthy People 2020 goals, as well as those well beyond 2020:

1. To promote the development, promotion, initiation, and enhancement of curricula for undergraduate medical providers (medical students, extenders, nurses, and other medical support personnel trainees).³⁴ It provides a solid grounding in the major concepts of physical activity and exercise science and lifestyle-focused behavior modification techniques to empower medical providers to modify their own behaviors as appropriate, to speak intelligently to patients about physical activity or exercise programs, and to adapt such programs as fitness improves.
2. To have every primary care provider and as many specialty providers for whom it is appropriate assess physical activity as a vital sign for every patient at every visit. The goal is to achieve Healthcare Effectiveness Data Information Set measures of physical activity in the clinic setting for all Americans (not just children and older adults).
3. To promote physical activity counseling in the clinic setting, with referral into community-based support resources (including the medical home model) as appropriate.³⁵
4. To support the accumulation of more evidence on the effects of physical activity and inactivity on health and disease, defined broadly around all of the components of health that are favorably modified by lifestyle physical activity, structured exercise, or both.
5. To have new evidence generated about physical activity and inactivity regularly incorporated into guidelines. This is critical to improve the delivery of care and to integrate physical activity and physical fitness assessment into primary and secondary prevention.

How AHA Goals and Recommendations Dovetail With the NPAP

Each decade, the AHA defines Impact Goals for the subsequent 10 years. With the increases in the prevalence of obesity and diabetes mellitus, both of which are on the causal pathway of physical inactivity and subsequent cardiovascular disease, it is clear that new strategies are needed to stem the associated looming consequences.

In 2010, the AHA set its strategic goals, called the 2020 Impact Goals: "By 2020, to improve the cardiovascular health of all Americans by 20% while reducing deaths from cardiovascular diseases and stroke by 20%."³⁶ These goals represent a fundamental shift in policy for AHA, moving from a traditionally oriented medical model toward a public health model focused on promoting cardiovascular health with increased emphasis on primordial prevention.

This fundamental shift in policy is accompanied by a linguistic shift by defining ideal cardiovascular health factors (as opposed to risk factors for cardiovascular disease) and by promoting ideal health behaviors (as opposed to diminishing risk behaviors). The health factors include untreated total cholesterol <200 mg/dL, untreated blood pressure <120/80 mmHg, and fasting blood glucose <100 mg/dL. The health behaviors include body mass index between 18.5 and 25 kg/m², adherence to a healthy diet, not smoking, and physical activity at goal levels.³⁶

The promotion of regular physical activity on a population-wide basis rather than as a recommendation focused on high-risk individuals thus becomes a primary focus for achieving ideal cardiovascular health. The associated outcomes depend in part on the characteristics (frequency, duration, intensity) of the exercise program. The committee recommends that adults ≥20 years of age perform ≥150 min/wk of moderate-intensity activity, ≥75 min/wk of vigorous-intensity activity, or a combination thereof. The corresponding goal for children 12 to 19 years of age is ≥60 minutes of moderate- or vigorous-intensity activity every day.³⁷ Achievement of desirable moderate and vigorous physical activity levels of ≥150 and ≥75 min/wk, respectively, is also a goal in secondary prevention. Achievement of these goals will be tracked individually and as part of the Ideal Behavior Index.³⁸ Elimination of health disparities is an important component of the AHA 2020 goals and will be monitored through sex- and race-specific prevalences and through awareness, treatment, and control measures of primary and secondary cardiovascular health metrics.

AHA 2020 goals are thus well aligned with the key goals and strategies of the NPAP, and many of AHA's initiatives are supportive of the recommendations of the plan. Participation of AHA and its members in the NPAP will help the organization to achieve its ambitious goals of improving cardiovascular health and reducing deaths caused by cardiovascular disease and stroke over the next decade.

A Call to Action to the AHA Community

As noted, the NPAP is targeted to policy makers, government agencies, decision makers, community planners, and organizational leaders, those who facilitate large-scale environment and policy change. However, much of the success of the plan clearly rides on the local and individual efforts, and AHA members must play an integral role in helping achieve the goals of the plan.

Table 3. Summary of Priority Strategies for Implementation of the National Physical Activity Plan

Sector	Example of Strategies
Education	<p>Develop comprehensive school physical activity programs.</p> <p>Create and implement mechanisms for accountability in school programs and at the state level.</p> <p>Connect youth with physical activity opportunities in schools and communities.</p> <p>Ensure that early childhood education settings for children 0–5 y of age promote and facilitate physical activity.</p> <p>Promote physical activity before and after school.</p>
Business/industry	<p>Identify and collect best practices and model interventions.</p> <p>Develop a multicomunication and outreach plan designed to engage, inform, and inspire leaders to promote active lifestyles in organizations, industries, and local communities.</p> <p>Develop legislation and policy agendas that promote employer-sponsored physical activity. Carefully protect individual employees' and dependents' rights.</p>
Parks, recreation, fitness, and sports	<p>Promote physical activity programs where people live, work, learn, play, and worship. Provide access to safe and affordable physical activity opportunities.</p> <p>Enhance existing parks, recreation, fitness, and sports infrastructure. Build capacity to disseminate policy and environmental interventions that promote physical activity.</p> <p>Use existing professional, amateur, and college athletics and sports infrastructures to enhance to enhance physical activity opportunities in communities.</p> <p>Increase funding and resources for high-need areas in parks, recreation, fitness, and sports.</p> <p>Improve and monitor physical activity levels. Gauge program effectiveness in parks, recreation, fitness, and sports settings. Base information on geographic population representation, not just merely numbers served.</p> <p>Coordinate advocacy to integrate physical activity opportunities into open spaces and outdoor recreation areas. Maintain and enhance environmental functions and values.</p>
Land use and community design	<p>Identify new partners and strengthen existing partnerships to adopt approaches that support bicycling, walking, and active community environments.</p> <p>Improve community planning processes to integrate and prioritize opportunities to increase bicycling, walking, and other physical activity–related outcomes.</p> <p>Implement policy approaches that target and prioritize resources to increase walking, bicycling, and other physical activity.</p> <p>Increase accountability of government agencies to increase walking and bicycling with established annual targets and performance measures.</p> <p>Improve infrastructure access to and site location of schools, recreational facilities, and public transportation to increase walking and bicycling.</p> <p>Increase the awareness, knowledge, and skills of professionals, elected officials, and citizen advocates who will implement approaches to support active community environments.</p>
Health care	<p>Make physical activity a vital sign for healthcare providers to assess and discuss with patients/clients.</p> <p>Include physical activity education in the training of all healthcare professionals.</p> <p>Advocate at the local, state and institutional levels for policies and programs that promote physical activity.</p>
Public health	<p>Develop and maintain an ethnically and culturally diverse public health workforce of both sexes with competence and expertise in physical activity and health.</p> <p>Disseminate tools and resources to promote physical activity, including resources that address the burden of disease resulting from inactivity, implementation of evidence-based interventions, and funding opportunities for physical activity initiatives.</p> <p>Expand the monitoring of policy and environmental determinants of physical activity and the levels of physical activity in communities, and monitor the implementation of public health approaches to promote active lifestyles.</p>
Mass media	<p>Enact federal legislation to support a sustained physical activity mass media campaign.</p> <p>Encourage public health agencies to form partnerships with other agencies across the 8 sectors to combine resources around common themes in promoting physical activity.</p>



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AHA volunteers are critical in helping to educate policy and decision makers about the importance of active transportation policy to facilitate the Safe Routes to School and Complete Streets programs, comprehensive worksite wellness programs, shared use of school facilities for recreation and other physical activity opportunities, and more frequent quality physical education and physical activity in our nation’s schools. Other critical initiatives that support the NPAP and are congruent with

AHA advocacy priorities are transforming the built environment of communities to facilitate active living; advocating for physical activity standards in early childcare programs; promulgating insurance coverage for obesity screening; and diagnosing and treating sedentary lifestyle-mediated unhealthy conditions that include physical activity counseling and behavior change.

To continue the important work guided by the NPAP, the AHA, with its 22.5 million volunteers across the country,

should continue to prioritize lifestyle modification in all prevention efforts and to ensure that physical activity and physical fitness objectives are inserted into the state and federal policy landscapes. AHA members can lend a voice in grassroots advocacy efforts, testify before policy makers, promote AHA programming efforts, integrate physical activity assessment into the healthcare environment, and serve as role models themselves. Indeed, it is critical to the nation's health that they do so.

AHA Commitment

While working to mobilize its extensive volunteer and member network to implement the NPAP, the AHA is also incorporating the NPAP's goals within its policy and advocacy priorities, programming efforts, science/research, and coalition building, as well as promoting them internally within the organization and to external partners.

The AHA is a member of the National Coalition to Promote Physical Activity, which has been involved in implementing the plan. The National Coalition to Promote Physical Activity focuses on federal physical activity policy. The National Coalition to Promote Physical Activity helped NPAP establish the 8 societal sector teams under the priority areas of the plan noted above. These sector teams bring together national organizations, researchers, practitioners, and others working to share contemporary developments and best practices to cultivate resources, collaboration, and momentum for policy change at the federal level. As part of this implementation effort, AHA is involved in several ways: coleading the business and industry sector with the American Council on Exercise and the International Health, Racquet, and Sportsclub Association; participating in some of the other sector groups as an advisor or strategy leader; and supporting the overall priorities of each of the sectors.

In the healthcare sector, led by the American Medical Association and American College of Sports Medicine, the current emphasis is on making physical activity a vital sign for healthcare providers to discuss and assess with patients. At least 1 of the major electronic medical record companies will

incorporate physical activity tracking fields in its software, which will include a standardized measure for physical activity for adults and promote selecting physical activity assessment as a Healthcare Effectiveness Data Information Set measure.

Finally, it will be critical that experts within AHA leadership advocate for regular revision and update of the Physical Activity Guidelines for Americans, essential for maintaining the global leadership of the United States in physical activity research and translation. Integrated throughout AHA's policy work is an emphasis on reducing health disparities in high-risk population subsets, including those in lower socioeconomic strata. The AHA should continue to partner with other organizations to amplify efforts around implementation of the NPAP, mobilizing grassroots reach to create awareness, engagement, and motivation within the American public for active living in accordance with the Physical Activity Guidelines for Americans.

Conclusions

Physical inactivity is a primary contributor to cardiovascular disease and overall morbidity and mortality in the United States and throughout the world. It is recognized by the AHA as a major threat to cardiovascular health and a target for our 2020 Impact Goals. Through the NPAP, the AHA has partnered with other similarly minded foundations and organizations, both public and private, to address the health needs of all Americans, to heighten attention to this issue, and to promote increased physical activity and structured exercise in our daily lives through targeted initiatives (Table 3). However, this effort will not be accomplished by organizations but through the efforts of individuals acting locally, regionally, and nationally through both professional and personal efforts. We call on all members of the AHA to review the NPAP (www.physicalactivityplan.org) and to seek out opportunities to further the goals of and objectives outlined herein.

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*Modest.

†Significant.

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References

1. *Physical Activity Guidelines Advisory Committee Report: 2008*. Washington, DC: US Department of Health and Human Services, Physical Activity Guidelines Advisory Committee; 2008.
2. Pate RR, O'Neill JR, Lobelo F. The evolving definition of "sedentary." *Exerc Sport Sci Rev*. 2008;36:173–178. doi: 10.1097/JES.0b013e3181877d1a.
3. Cart LRSM for Sedentary Behaviour Research Network. Letter to the editor: standardized use of the terms "sedentary" and "sedentary behaviours." *Appl Physiol Nutr Metab*. 2012;37:540–542. doi: 10.1139/h2012-024.
4. Kohl HW 3rd, Craig CL, Lambert EV, Inoue S, Alkandari JR, Leetongin G, Kahlmeier S; Lancet Physical Activity Series Working Group. The pandemic of physical inactivity: global action for public health. *Lancet*. 2012;380:294–305. doi: 10.1016/S0140-6736(12)60898-8.
5. Booth FW, Lees SJ. Fundamental questions about genes, inactivity, and chronic diseases. *Physiol Genomics*. 2007;28:146–157. doi: 10.1152/physiolgenomics.00174.2006.
6. Lees SJ, Booth FW. Physical inactivity is a disease. In: Simopoulos AP, ed. *Nutrition and Fitness: Mental Health, Aging, and the Implementation of a Healthy Diet and Physical Activity Lifestyle*. Basel, Switzerland: Karger; 2005.
7. Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT; Lancet Physical Activity Series Working Group. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *Lancet*. 2012;380:219–229. doi: 10.1016/S0140-6736(12)61031-9.
8. Booth FW, Gordon SE, Carlson CJ, Hamilton MT. Waging war on modern chronic diseases: primary prevention through exercise biology. *J Appl Physiol* (1985). 2000;88:774–787.
9. US Department of Health and Human Services. *Physical Activity and Health: A Report of the Surgeon General*. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion; 1996.
10. Manson JE, Greenland P, LaCroix AZ, Stefanick ML, Mouton CP, Oberman A, Perri MG, Sheps DS, Pettinger MB, Siscovick DS. Walking compared with vigorous exercise for the prevention of cardiovascular events in women. *N Engl J Med*. 2002;347:716–725. doi: 10.1056/NEJMoa021067.
11. Bey L, Hamilton MT. Suppression of skeletal muscle lipoprotein lipase activity during physical inactivity: a molecular reason to maintain daily low-intensity activity. *J Physiol*. 2003;551(pt 2):673–682. doi: 10.1113/jphysiol.2003.045591.
12. Pahkala K, Heinonen OJ, Lagström H, Hakala P, Simell O, Viikari JS, Rönnemaa T, Hernelahti M, Sillanmäki L, Raitakari OT. Vascular endothelial function and leisure-time physical activity in adolescents. *Circulation*. 2008;118:2353–2359. doi: 10.1161/CIRCULATIONAHA.108.791988.
13. Church TS, Thomas DM, Tudor-Locke C, Katzmarzyk PT, Earnest CP, Rodarte RQ, Martin CK, Blair SN, Bouchard C. Trends over 5 decades in U.S. occupation-related physical activity and their associations with obesity. *PLoS One*. 2011;6:e19657. doi: 10.1371/journal.pone.0019657.
14. Centers for Disease Control and Prevention (CDC). Trends in leisure-time physical inactivity by age, sex, and race/ethnicity—United States, 1994–2004. *MMWR Morb Mortal Wkly Rep*. 2005;54:991–994.
15. Office of Disease Prevention and Health Promotion. 2008 Physical activity guidelines for Americans. <http://www.health.gov/paguidelines/guidelines>. Accessed December 14, 2014.
16. Lees SJ, Booth FW. Sedentary death syndrome. *Can J Appl Physiol*. 2004;29:447–460.
17. *Mortality and Burden of Disease Estimates for WHO Member States in 2004*. Geneva, Switzerland: World Health Organization; 2009.
18. Lee DC, Sui X, Ortega FB, Kim YS, Church TS, Winett RA, Ekelund U, Katzmarzyk PT, Blair SN. Comparisons of leisure-time physical activity and cardiorespiratory fitness as predictors of all-cause mortality in men and women. *Br J Sports Med*. 2011;45:504–510. doi: 10.1136/bjism.2009.066209.
19. Political declaration of the high-level meeting of the General Assembly on the prevention and control of non-communicable diseases. General Assembly of the United Nations, 66th Session; September 19–20, 2011; New York, NY. <http://www.un.org/en/ga/ncdmeeting2011/>. Accessed December 14, 2014.
20. Beaglehole R, Bonita R, Alleyne G, Horton R, Li L, Lincoln P, Mbanya JC, McKee M, Moodie R, Nishtar S, Piot P, Reddy KS, Stuckler D; Lancet NCD Action Group. UN High-Level Meeting on Non-Communicable Diseases: addressing four questions. *Lancet*. 2011;378:449–455. doi: 10.1016/S0140-6736(11)60879-9.
21. Bauman AE, Reis RS, Sallis JF, Wells JC, Loos RJ, Martin BW; Lancet Physical Activity Series Working Group. Correlates of physical activity: why are some people physically active and others not? *Lancet*. 2012;380:258–271. doi: 10.1016/S0140-6736(12)60735-1.
22. US Department of Transportation Federal Highway Administration. 2009 National household travel survey. <http://nhts.orl.gov/2009/pub/stt.pdf>. Accessed December 14, 2014.
23. Reeves MJ, Rafferty AP. Healthy lifestyle characteristics among adults in the United States, 2000. *Arch Intern Med*. 2005;165:854–857. doi: 10.1001/archinte.165.8.854.
24. Simpson ME, Serdula M, Galuska DA, Gillespie C, Donehoo R, Macera C, Mack K. Walking trends among U.S. adults: the Behavioral Risk Factor Surveillance System, 1987–2000. *Am J Prev Med*. 2003;25:95–100.
25. Rafferty AP, Reeves MJ, McGee HB, Pivarnik JM. Physical activity patterns among walkers and compliance with public health recommendations. *Med Sci Sports Exerc*. 2002;34:1255–1261.
26. Franklin BA, Brinks J, Sternburgh L. Move more, sit less: a first-line, public health preventive strategy? *Prev Cardiol*. 2010;13:203–208. doi: 10.1111/j.1751-7141.2010.00075.x.
27. American College of Sports Medicine. Charting and changing the policy landscape: promoting physical activity and reversing inactivity through policy solutions. 2006.
28. Pate RR, Pratt M, Blair SN, Haskell WL, Macera CA, Bouchard C, Buchner D, Ettinger W, Heath GW, King AC, Kriska A, Leon AS, Marcus BH, Morris J, Paffenbarger RS Jr, Patrick K, Pollock ML, Rippe JM, Sallis J, Wilmore JH. Physical activity and public health: a recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. *JAMA*. 1995;273:402–407.
29. Haskell WL, Blair SN, Hill JO. Physical activity: health outcomes and importance for public health policy. *Prev Med*. 2009;49:280–282. doi: 10.1016/j.ypmed.2009.05.002.
30. Pate RR. A national physical activity plan for the United States. *J Phys Act Health*. 2009;6(suppl 2):S157–S158.
31. Moyer VA; U.S. Preventive Services Task Force. Screening for and management of obesity in adults: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2012;157:373–378. doi: 10.7326/0003-4819-157-5-201209040-00475.
32. Lin JS, O'Connor E, Whitlock EP, Beil TL. Behavioral counseling to promote physical activity and a healthful diet to

- prevent cardiovascular disease in adults: a systematic review for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2010;153:736–750. doi: 10.7326/0003-4819-153-11-201012070-00007.
33. Franklin BA, Vanhecke TE. Counseling patients to make cardioprotective lifestyle changes: strategies for success. *Prev Cardiol.* 2008;11:50–55.
 34. Lloyd-Jones DM, Hong Y, Labarthe D, Mozaffarian D, Appel LJ, Van Horn L, Greenlund K, Daniels S, Nichol G, Tomaselli GF, Arnett DK, Fonarow GC, Ho PM, Lauer MS, Masoudi FA, Robertson RM, Roger V, Schwamm LH, Sorlie P, Yancy CW, Rosamond WD; on behalf of the American Heart Association Strategic Planning Task Force and Statistics Committee. Defining and setting national goals for cardiovascular health promotion and disease reduction: the American Heart Association's Strategic Impact Goal through 2020 and beyond. *Circulation.* 2010;121:586–613. doi: 10.1161/CIRCULATIONAHA.109.192703.
 35. Trilk JL, Phillips EM. Incorporating “exercise is medicine” into the University of South Carolina School of Medicine Greenville and Greenville Health System. *Br J Sports Med.* 2014;48:165–167. doi: 10.1136/bjsports-2013-093157.
 36. Joy EL, Blair SN, McBride P, Sallis R. Physical activity counselling in sports medicine: a call to action. *Br J Sports Med.* 2013;47:49–53. doi: 10.1136/bjsports-2012-091620.
 37. Blair SN, Morris JN. Healthy hearts—and the universal benefits of being physically active: physical activity and health. *Ann Epidemiol.* 2009;19:253–256. doi: 10.1016/j.annepidem.2009.01.019.
 38. Mora S, Cook N, Buring JE, Ridker PM, Lee IM. Physical activity and reduced risk of cardiovascular events: potential mediating mechanisms. *Circulation.* 2007;116:2110–2118. doi: 10.1161/CIRCULATIONAHA.107.729939.

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