

The US Physical Activity Guidelines Advisory Committee Report—Introduction

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The history of the human race is reflected in and shaped by the overall levels of physical activity in which we engage. The benefits of an active lifestyle for human survival throughout most of human history are self-evident. However, as advances in food supply and distribution, transportation, labor, and other important areas of human endeavor grew, the drive for efficiency and convenience supplanted the need to move. The resulting population-level decreases in work-, household-, and transport-related physical activity and increases in sedentary behavior during work and leisure time have contributed significantly to the major noncommunicable diseases representing today's major killers in the United States and globally (1).

A decade ago, the US government published the nation's first formal guidelines related to physical activity and health (2). This groundbreaking policy document was based on an in-depth systematic review and summarization of the available literature conducted independently by the 2008 Physical Activity Guidelines Advisory Committee, which was assembled by the US Department of Health and Human Services (USDHHS) for this purpose (3). The Advisory Committee report confirmed a range of health outcomes for which regular moderate-to-vigorous intensity physical activity plays an important mitigating or beneficial role.

Ten years later, the substantial growth in the scope, depth, and breadth of the physical activity and health literature

warranted a second formal US government-sponsored systematic review of this literature. In June of 2016, the 2018 Physical Activity Guidelines Advisory Committee was convened by the Office of Disease Prevention and Health Promotion of the USDHHS and charged with independently reviewing the scientific literature on physical activity and health. The Committee sought to build on and expand the findings described in the 2008 report (3). In addition, the Committee included two topics not addressed in the 2008 Report—sedentary behavior and interventions to promote regular physical activity. The current literature also allowed the Committee to examine several areas for which there was limited or no information in 2008. These areas included health effects in children younger than 6 yr; cognitive function across the lifespan; prevention of excessive weight gain; and the preventive health effects of physical activity among individuals with one or more existing chronic conditions.

The structured review process for the Physical Activity Guidelines for Americans 2018 Scientific Report was extensive. It involved 17 Committee members and additional scientific experts working on nine subcommittees and several working groups across a 2-yr period. All of these individuals volunteered their time throughout the scientific review and report development process. The analytic plan, inclusion and exclusion criteria, and specific search terms were developed jointly by the Committee and the staff of a company named ICF, a research firm under contract with the USDHHS. ICF performed all literature searches, following which the Committee reviewed the searches and selected the articles to be included in the Committee's deliberations. The Committee's final report was presented to the US Secretary of the Department of Health and Human Services in February of 2018. The report was used in the development of the 2018 Guidelines by USDHHS personnel independent of the Committee (4).

The articles in this special issue of MSSE are based on the research performed for the Committee's scientific report. The full methods for the rigorous evidence search and

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systematic review process are described in the 2018 Scientific Report document (5). For most topic areas, the evidence search process captured the relevant literature through 2016. Because of the size of the literature in many areas, most searches were limited to peer-reviewed, high-quality meta-analyses, systematic reviews, pooled analyses, and reports published in English. The articles contained in this issue represent the majority of topics described in the 2018 Scientific Report. In addition, for those topic areas for which the additional literature that became available between 2017 and March of 2018 was manageable in size, the original evidence searches and systematic review processes were applied so as to allow additional new literature to be included in the current articles in this issue.

The articles in this issue are organized into four sections. The first section focuses on new issues in evaluating dimensions of physical activity behavior affecting health (6–9). The 2018 *Physical Activity Guidelines Advisory Committee Scientific Report* addressed the following timely questions related to our understanding of the types and amounts of physical activity that influence health outcomes: are there simpler metrics than self-reported estimates of time spent in aerobic moderate-to-vigorous physical activity—such as step counts—for estimating the volume of health-promoting behavior? What, if any, is the value of light-intensity physical activity as represented by step counts? Do short episodes of activity—bouts less than 10-min duration—contribute to accumulated beneficial physical activity? How does high-intensity interval training fit into health recommendations? What are the relationships among sedentary behavior, physical activity and health? For instance, does the effect of moderate-to-vigorous physical activity on all-cause mortality vary by amount of sedentary behavior?

The second section focuses on physical activity and selected health outcomes, which were chosen based on their significance for the US population and the increasing size and robustness of the evidence base in these areas (10–13). Among the systematic reviews included in this section are the effects of physical activity on the brain and cognition; the state of the evidence on physical activity in cancer prevention and survivorship; the role of physical activity for prevention of weight gain in adults; and the current evidence on the effects of

moderate-to-vigorous physical activity on all-cause mortality, cardiovascular mortality and cardiovascular disease. While some of the reviews in this section represent an update and extension of the systematic evidence reviews informing the 2008 Physical Activity Guidelines (e.g., cancer, all-cause and cardiovascular mortality), others represent emerging areas not systematically reviewed in the 2008 *Physical Activity Guidelines Scientific Report* (e.g., brain and cognition, prevention of weight gain).

The third section focuses on physical activity considerations and health outcomes for selected populations and health conditions (14–18). Included in this section are children under 6 yr of age—a population for which there was too little scientific information for it to be included in the 2008 *Physical Activity Guidelines Advisory Committee Report* (3); women during pregnancy and the postpartum period; older adults, with a particular focus on physical function; the role of physical activity in the prevention, treatment, and control of hypertension; and physical activity-related effects on pain, function, quality of life, and disease progression in persons with osteoarthritis.

The final section presents highlights of the systematic review of the extensive evidence base in the physical activity promotion field—an area that was not included in the 2008 *Physical Activity Guidelines Advisory Committee Report* (19). Using a social ecological perspective, the range of efficacious and promising interventions for physical activity promotion and sedentary behavior reduction are described.

Taken together, the extensive amount of evidence reviewed across the articles in this issue demonstrates the impact of a regularly active lifestyle in the prevention and/or control of a vast array of areas affecting overall health, function, and well-being. This knowledge, now including the evidence-supported methods for promoting regular physical activity, represents a “clarion call” to health professionals, policy makers, community organizations, and scientists alike to work together in applying this information in promoting a more active—and in turn healthier and more vital—population.

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