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A New Metric for Promoting Cardiovascular Health: Life's Essential 8

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In 2010, the American Heart Association (AHA) expanded its focus from illness to wellness and issued a definition of cardiovascular health (CVH) with the goal of promoting improvements on both an individual and population level.[1] This initial definition of CVH was based on seven potentially modifiable health factors and behaviors that, when optimal, were associated with greater cardiovascular disease (CVD)-free survival, longevity, and higher quality of life. Deemed "Life's Simple Seven" (LS7) the seven components of CVH included indicators of diet quality, participation in physical activity (PA), cigarette smoking, measures of body mass index (BMI), total cholesterol, fasting blood glucose, and blood pressure (BP) levels. Based on accepted clinical thresholds for children and adults, each metric was classified as poor (0), intermediate (1), or ideal (2). An overall summary score indicated the CVH status of the unit of assessment (individuals or populations) that could range from 0 (all metrics at poor levels), to 14 (all 7 metrics at ideal levels). [1]

Since publication of that 2010 AHA statement, substantial research has focused on assessing and quantifying CVH across the life course of individuals and diverse populations, nationally and globally. Taken together, the evidence generated from clinical and population-based studies has advanced the science of life course CVH and supported the importance of both primordial and primary prevention. Most recently, an AHA Presidential Advisory updated and enhanced the construct of CVH to reflect evidence generated in the past decade as well methodological limitations noted in LS7. [2] Labeled "Life's Essential Eight" (LS8), the seven components of CVH were retained with some modifications (described below). Sleep health was added based on emerging evidence regarding its importance in promoting CVH across the life course and foundational factors for CVH including social determinants of health and psychological well-being were emphasized as important contexts for CVH. [2]

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Updated Definitions and Assessment of CVH Metrics

Life's Essential Eight (LE8) includes the eight components of CVH: healthy diet, participation in physical activity, avoidance of nicotine, healthy sleep, healthy weight and healthy levels of blood lipids, blood glucose and blood pressure.[2] Several of the original seven metrics have been redefined based on available evidence and clinical guidelines as well as emergence of better measurement tools:

Diet:

The LE8 writing group supported the goal of pursuing the Dietary Approaches to Stop Hypertension (DASH) and Mediterranean-style eating patterns as being most consistent with optimal CVH. In so doing it was recognized that there is no one such eating pattern and limited tools for assessing alignment with these eating patterns. The DASH-style pattern is more easily assessed at the population level; a rapid dietary assessment tool, modified Mediterranean Eating Pattern for Americans (MEPA) is recommended for assessment at the individual level. The Healthy Eating Index (HEI) was suggested as a means for aligning and linking these assessments when needed.[3] Important to emphasize is that this new approach to assessing diet in both clinical and research settings is focused on individuals' eating patterns and intake of whole food, rather than nutrients. Recommended approaches for scoring of the diet metric are included in Supplementary Materials.[4]

Nicotine exposure:

Reflecting both adult and childhood use of inhaled nicotine-delivery systems (vaping devices, e-cigarettes) and implications for long-term health, these have been added to the LE8 metric. Secondhand smoke exposure, known to have adverse effects on cardiovascular and overall health, has also been added. [5]

Blood lipids:

Because it can be measured in the non-fasting state and reliably calculated in individuals, non-high density lipoprotein cholesterol (non-HDL-C) is recommended as metric instead of total cholesterol (TC). Additional rationale in support of non-HDL-C is evidence demonstrating associations of other atherogenic lipoprotein fractions, not captured in measuring TC, and adverse cardiovascular outcome across the life course.

Blood glucose:

Included in this metric is measurement of hemoglobin A1c for individuals with or without diabetes; among individuals with diabetes, hemoglobin A1C is a better indicator of glycemic control than blood glucose levels.

Sleep Health:

With the endorsement of sleep as a component of cardiovascular health, the LE8 writing group recommended systematic assessment and inclusion of sleep duration as current method for capturing sleep health.

In assessing and quantifying each of the original metrics (LS7), responsiveness to interindividual variation and intraindividual change was evaluated. As such, each metric in LE8 has a new scoring algorithm ranging from 1 to 100 points resulting in a new composite cardiovascular health score that also varies from 0 to 100. Of note, childhood metrics were updated in LE8 to reflect current evidence-based pediatric guidelines as well as to extend to younger ages and provide better alignment with transitions to adulthood. Detailed in the Supplementary Materials are approaches to quantifying CVH in young children.[4]

The Foundational Context of Cardiovascular Health: Social Determinants of Health and Psychological Health and Well-Being

Social determinants of health (SDOH), the conditions in the environments in which people are born, live, learn, and work, affect health, quality of life, access and availability of health care across the life course. Viewed within a socio-ecological systems model, the LE8 writing group placed emphasis on five domains of SDOH: economic stability, neighborhood and built environment, education, social and community context, and health and health care. [2] Relatedly and more specifically, interacting factors highlighted by the LE8 group, provide important context for CVH including structures and systems (socioeconomic, cultural, and environmental conditions), community resources (education, agriculture, food production, employment, water and sanitation, healthcare and housing) institutions and organizations (where individuals learn, grow and develop, play and pray), interpersonal social and community networks and individual genetic and behavioral factors. As emphasized by the LE8 writing group, these foundational socio-ecological factors work through and alongside an individual's psychological health to provide the context for what is possible in improving or maintaining CVH. [2]

Psychological health and well-being have received significant research attention in recent years and merited a recent AHA scientific statement that addressed a range pf both positive (optimism, sense of purpose, happiness) as well as negative (stress, depression, anxiety) psychological health factors and their significant associations with CVH and CVD risk respectively. [6] Guided and informed by findings summarized in this statement, the LE8 writing group judged that psychological health and well-being form a critical context for CVH. [2] Of note, there are multiple direct and indirect pathways by which psychological health and well-being may influence CVH and CVD risk. Conceptualized as direct and indirect, these include physiological pathways (inflammatory response, glucose and lipid homeostasis, coagulation) related to chronic stress, indirect effects on health behaviors known to impact CVH and CVD risk and, changes in psychosocial resilience factors that promote or impair health or have the potential to buffer adverse effects of stressful experiences that emerge across the life course of individuals.[6] While viewed as a critically important context for CVH, given the multiple dimensions of psychological health and

well-being and lack of a composite indicator / measurement, the writing group judged this to be a foundational factor underlying all of the CVH metrics, rather than a distinct metric. [2]

Implementation of LE8 in Clinical Practice and In Diverse Populations and Settings: Challenges and Opportunities

With the goal of improving CVH on an individual and population level, the LE8 writing group offered recommendations for implementation applicable in clinical settings as well in diverse population settings. Recognizing the proliferation of health technologies, the potential for health systems, individuals and families to participate in the collection of CVH data was highlighted with a subtle “call to action” to existing health systems or the AHA to provide platforms designed to assist patients and respective healthcare teams in assessing CVH as well as tracking progress over time through online website or apps. [2] Once developed and implemented effectively, such platforms could also be used to aggregate CVH data for population health monitoring, risk prediction or for interventions designed to promote CVH by motivating behavior change among diverse populations. Of note, most CVH metrics are captured as fields in the electronic health record (EHR) and this mechanism (where available in health systems) could also be used to assess, monitor and intervene on CVH with individuals/patients across the life course.

The LE8 writing group offered recommendations for clinician-patient interaction focused on CVH. Suggestions emphasize basic principles of behavior change including motivational interviewing, also known as person- centered counseling, to assist patients identify metrics that would benefit from improvement and for which the patient expresses readiness to change and has the resources and supports to do so. [7] As emphasized in LE8, concerted efforts and tailored, culturally appropriate methods will be needed to direct individuals to resources for improving and maintaining CVH. In so doing, consideration of the important (aforementioned) foundational contexts of CVH; SDOH and the psychological well-being of patients from diverse populations is essential with aim of mitigating the negative impacts of SDOH and promoting positive social and psychological assets. [8–10] Relatedly, effective communication with patients in diverse settings regarding CVH requires attention to the SDOH with the goal of promoting CVH equity. The LE8 writing group also provides recommendation for promoting CVH in neighborhoods and communities, going beyond traditional settings and considering the sociocultural context of individuals and families. Indeed, and building on what is known about such community-based interventions, the writing group acknowledges that more research is needed to guide and inform effective implementation and CVH on an individual and population level.[2]

Cardiovascular nurses are well prepared and positioned in clinical and community-based settings to apply LE8 recommendations, advocate for effective implementation in healthcare systems and community-based organizations, and contribute to the knowledge base designed to promote optimal CVH for individuals across the life course and in diverse and marginalized populations. Relatedly, we must advocate for multilevel policies designed to mitigate the adverse SDOH and promote psychological health and well-being, the essential contexts of CVH.

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