

ORIGINAL RESEARCH ARTICLE

Examining the relationship between Life’s Essential 8 and atherosclerotic cardiovascular disease among Adults in the United States: Insights from the National Health and Nutrition Examination Surveys (2017-2020)

Supplementary file

Table S1. Definition and scoring methodology for the Life’s Essential 8 (LE8) score, designed for individuals aged 20 years and older

Domain	LE8 metric	Measurement method	Quantifying the LE8 metric (≥ 20 years of age)	
Health behaviors	Sleep	<i>Measurement:</i> Self-reported average hours slept per night. <i>Example tool for measurement:</i> “On average, how many hours of sleep do you typically get per night?”	Mean hours of sleep per night (x)	
			Points	Mean duration of sleep (h)
			100	7 ≤ x < 9
			90	9 ≤ x < 10
			70	6 ≤ x < 7
	40	5 ≤ x < 6; ≥ 10		
	20	4 ≤ x < 5		
	0	< 4		
	Dietary intake	<i>Measurement:</i> Assessed using HEI-2015; dietary intake data from two 24-h dietary recalls were converted to the USDA food pattern equivalents to compute HEI-2015 scores	Percentiles of HEI-2015	
			Points	Percentile
			100	≥ 64.8 th
			80	60 th – 64.8 th
			60	56.11 th – 60 th
	40	49.48 th – 56.11 th		
	20	42.60 th – 49.48 th		
0	< 42.16 th			
Exposure to nicotine	<i>Measurement:</i> Self-reported cigarette or non-cigarette tobacco product use was assessed. <i>Example tool for measurement:</i> NHANES-SMQ	Utilization of combustible tobacco products or non-cigarette tobacco product use, as well as exposure to secondhand smoke		
		Points	Status	
		100	Never smoked	
		75	Former smoker, quit ≥ 5 years	
		50	Former smoker, quit ≥ 1 and < 5 years	
25	Former smoker, quit < 1 year; currently using inhaled NDS			
0	Current smoker			
Physical activity (PA)	<i>Measurement:</i> Self-reported minutes of moderate or vigorous PA per week <i>Example tool for measurement:</i> NHANES PAQ-K questionnaire	Duration (min) of moderate (or greater) intensity activity per week		
		Points	Duration (min)	
		100	≥ 150	
		90	120–149	

(Cont’d...)

Table S1. (Continued)

Domain	LE8 metric	Measurement method	Quantifying the LE8 metric (≥ 20 years of age)	
			80	90–119
			60	60–89
			40	30–59
			20	1–29
			0	0
Health factors	BMI	<i>Measurement:</i> Body weight (kg) divided by height squared (m^2) <i>Example tool for measurement:</i> Objective measurements of height and weight	Body weight (kg) divided by height squared (m^2)	
			Points	BMI (kg/m^2)
			100	< 25
			75	25.0–30.0
			50	30.0–35.0
			25	35.0–40.0
			0	≥ 40.0
	Total blood cholesterol	<i>Measurement:</i> Non-HDL cholesterol <i>Example tools for measurement:</i> Fasting or non-fasting blood sample	Enzymatically measured total cholesterol minus HDL cholesterol (mg/dL)	
			Points	Non-HDL cholesterol (mg/dL)
			100	< 130
			60	130–159
			40	160–189
			20	190–219
			0	≥ 220
	BP	<i>Measurement:</i> Appropriately measured SBP and DBP <i>Example tools for measurement:</i> Appropriately sized BP cuff	Appropriately measured SBP and DBP (mm Hg)	
Points			BP (mm Hg)	
100			SBP <120; DBP <80 (optimal)	
75			SBP: 120–129; DBP <80 (elevated)	
50			SBP: 130–139 or DBP: 80–89 (stage 1 hypertension)	
25			SBP: 140–159 or DBP: 90–99	
		0	SBP ≥ 160 or DBP ≥ 100	
Blood glucose	<i>Measurement:</i> FBG or casual HbA1c <i>Example tools for measurement:</i> Fasting (FBG or HbA1c) or non-fasting (HbA1c) blood sample	FBG (mg/dL) or HbA1c (%)		
		Points	Status (FBG [mg/dL]/HbA1c [%])	
		100	No history of diabetes and FBG <100 (or HbA1c <5.7)	
		60	No diabetes and FBG: 100–125 (or HbA1c: 5.7–6.4) (prediabetes)	
		40	Diabetes with HbA1c <7.0	
		30	Diabetes with HbA1c: 7.0–7.9	
		20	Diabetes with HbA1c: 8.0–8.9	
		10	Diabetes with HbA1c: 9.0–9.9	
		0	Diabetes with HbA1c ≥ 10.0	

Note: The contents of this table have been adapted from the original source.¹

Abbreviations: BMI: Body mass index; BP: Blood pressure; DASH: Dietary Approaches to Stop Hypertension; DBP: Diastolic blood pressure; FBG: Fasting blood glucose; HbA1c: Hemoglobin A1c; HDL: High-density lipoprotein; HEI: Healthy Eating Index; MEPA: Mediterranean Eating Pattern for Americans; NDS: Nicotine-delivery systems; NHANES: National Health and Nutrition Examination Survey; PA: Physical activity; PAQ-K: Physical Activity Questionnaire K; SBP: Systolic blood pressure; SMQ: Smoking assessment; USDA: United States Department of Agriculture.

Table S2. The 13 dietary components and scoring criteria of the Healthy Eating Index (HEI)-2015

Intake	Component	Max score	Standard for maximum score	Standard for minimum score of zero
Adequate	Total fruits ^a	5	≥0.8 cup equiv. per 1,000 kcal	No fruits
	Whole fruits ^b	5	≥0.4 cup equiv. per 1,000 kcal	No whole fruits
	Total vegetables ^c	5	≥1.1 cup equiv. per 1,000 kcal	No vegetables
	Greens and beans ^c	5	≥0.2 cup equiv. per 1,000 kcal	No greens and beans
	Whole grains	10	≥1.5 oz equiv. per 1,000 kcal	No whole grains
	Dairy ^d	10	≥1.3 cup equiv. per 1,000 kcal	No dairy
	Total protein foods ^e	5	≥2.5 oz equiv. per 1,000 kcal	No protein foods
	Seafood and plant proteins ^e	5	≥0.8 oz equiv. per 1,000 kcal	No seafood or plant proteins
	Fatty acids ^f	10	(PUFAs+MUFAs)/SFAs ≥2.5	(PUFAs+MUFAs)/SFAs ≤1.2
Moderate	Refined grains	10	≤1.8 oz equiv. per 1,000 kcal	≥4.3 oz equiv. per 1,000 kcal
	Sodium	10	≤1.1 g per 1,000 kcal	≥2.0 g per 1,000 kcal
	Added sugars	10	≤6.5% of energy	≥26% of energy
	Saturated fats	10	≤8% of energy	≥16% of energy

Notes: Scores are allocated proportionally based on intakes ranging between the minimum and maximum thresholds; ^aincludes 100% fruit juice;

^bcomprises all forms, except juice; ^ccomprises legumes (peas and beans); ^dcomprises all milk products, such as yogurt, cheese, fluid milk, and fortified soy beverages; ^ecomprises seeds, nuts, seafood, soy products (other than beverages), and legumes (peas and beans); ^fratio of poly - & monounsaturated fatty acids (PUFAs and MUFAs) to saturated fatty acids (SFAs); adding the maximum number of achievable points totaled to 100 points.

Reference

1. Lloyd-Jones DM, Hong Y, Labarthe D, *et al.* 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.
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