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Healthy Lifestyle and Risk of Heart Failure: An Ounce of Prevention Well Worth the Effort

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Despite the well-publicized decline in incidence of coronary heart disease and stroke in the US over the past half century, prevalence and incidence of heart failure (HF) have not experienced a parallel decline. Approximately 5.5 million Americans currently have chronic HF, which represents the most common reason for hospitalization among Medicare recipients. (1) Annual heath care costs for HF are estimated at $40 billion. Although major advances in medical and device therapy have modestly improved survival for the subset of HF patients with reduced left ventricular ejection fraction (LVEF), five year survival remains lower than many cancers. From a public health perspective, therefore, the primary prevention of HF is of tremendous importance to reduce the medical and societal costs of this disorder.

Several epidemiological studies in the last decade have demonstrated an association between lifestyle variables and HF risk in the general population. In these studies, a healthy lifestyle, defined by maintaining regular physical activity, a healthy dietary pattern, a normal body mass index (BMI), and not smoking resulted in 45–81% reductions in HF incidence.(2–4) Furthermore these studies have shown a graded reduction in HF risk in parallel to the number of healthy lifestyle practices followed.

With this background, the study by Larsson et al in this issue of *Circulation: Heart Failure* provides additional strong epidemiological evidence of a consistent and graded relationship between a healthy lifestyle and a lower risk of HF in two large Swedish cohorts over a 13 year follow-up. (5) In 33,966 men from the Cohort of Swedish men and 30,713 women from the Swedish Mammography Cohort, a detailed questionnaire administered in 1997 assessed smoking habits, physical activity patterns, diet and BMI. A healthy lifestyle was defined as not smoking, performing at least 150 minutes/week of walking, bicycling, and other exercise, adherence to a Mediterranean diet, and maintaining a BMI of 18.5–24.9 kg/m^2.

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Incident HF was ascertained by linkage of participants with the Swedish National Patient Register and Swedish National Cause of Death Register. After adjustment for key demographic and clinical variables, a strong graded inverse relationship was found between the number of healthy lifestyle variables and HF incidence. Compared with individuals with no healthy lifestyle variables, men reporting following all four variables experienced a 62% lower HF risk and women a 72% lower risk. Removing potential intermediates from the model (history of diabetes, hypertension, hypercholesterolemia, and atrial fibrillation) and excluding HF cases that developed within the first two years had minimal effect on the risk of HF. Although each of the four lifestyle variables was associated with a significantly lower risk of HF, smoking was the variable most strongly associated with HF risk. It is noteworthy that the large reductions in HF risk associated with a healthy lifestyle occurred in a population that was generally physically active, with a high quality diet and low prevalence of obesity.

Strengths of the study include the large sample of well-characterized men and women followed for 13 years and tracked for development of fatal and non-fatal HF by the Swedish National Registers. The strong graded relationship between the number of healthy lifestyle variables and the incidence of HF provides additional evidence that this relationship is likely causal. Limitations that must be recognized include the reliance on self-report for all 4 lifestyle variables assessed and absence of data regarding HF etiology or whether accompanied by reduced or preserved LVEF. One might anticipate that the reduction in HF incidence was primarily that from an ischemic etiology. In addition, no information was available on changes in blood pressure, lipids, glycemia, or smoking status during follow-up. As with all epidemiological studies, the possibility of residual confounding exists.

A substantial literature has described the beneficial effects of a healthy lifestyle on cardiovascular (CV) disease incidence and its antecedent risk factors. In the Nurses' Health Study, daily vigorous exercise, BMI <25, and high adherence to a DASH diet was associated with a 54% lower risk of hypertension compared to lack of these characteristics. (6) Incidence of type 2 diabetes (7) and atrial fibrillation (8) are lower in populations adhering to a healthy lifestyle. Such favorable lifestyle habits are also associated with reductions in incidence of myocardial infarction (9) and stroke (10). In the same Swedish male cohort studied by Larsson et al (5) in this issue of the journal, the four lifestyle variables previously described plus moderate alcohol intake were associated with 86% lower risk of myocardial infarction compared to having none of these habits. (9) Even cognitive performance appears to be better maintained in older adults who adhere to a healthy lifestyle and control their blood pressure, cholesterol, and glucose; a relationship was found between the number of favorable lifestyle variables and smaller declines in executive function and episodic memory. (11)

Given this consistently demonstrated benefit from adherence to a healthy lifestyle in multiple epidemiologic studies, with support for focused lifestyle interventions from clinical trials, the low overall adoption of these positive habits is disappointing. Recent data indicate that although smoking rates have declined to 17%, ~69% of Americans are obese or overweight, an ideal healthy diet score is found in only 1.5% of adults, and fewer than 50% meet the 2008 Physical Activity Guidelines benchmark of ≥150 minutes of moderate/

vigorous physical activity. (1) Thus, a major challenge to the physical, societal and economic well-being of the US population is to improve our lifestyles.

Major public health campaigns by government and private organizations have helped to publicize the importance of lifestyle variables in improving and maintaining CV health. For example, the 2020 Strategic Impact Goal of the American Heart Association includes improving the CV health of Americans by 20% by focusing on achieving 7 health metrics-"the simple seven". (12) These include regular physical activity, a healthy diet, maintaining a desirable weight, and smoking cessation (the same 4 variables studied by Larsson et al)(5) plus control of blood pressure, cholesterol and blood glucose. The US Preventive Services Task Force has published a Clinical Guideline on Behavioral Counseling to Promote a Healthy Diet and Physical Activity for Cardiovascular Disease Prevention in Adults with Cardiovascular Risk Factors. (13) A community-wide CV disease prevention program in rural Maine emphasizing lifestyle variables and control of traditional risk factors between 1970 and 2010 was accompanied by reduced smoking rates, improved control of hypertension and cholesterol and lower rates of hospitalization and mortality. (14)

Clinical studies have suggested that economic incentives are likely to improve adoption and adherence to healthy lifestyle behaviors. (15) The escalating costs of health insurance in the US could be mitigated by rewarding individuals who exercise regularly, adhere to a Mediterranean diet, control body weight, and do not smoke by lowering their premiums. On the provider side, pay for performance incentives should include financial rewards for practitioners who reduce obesity and smoking rates and increase physical activity in their practices. However, one obstacle to such progress is the lack of emphasis on healthy lifestyles in physician training. A recent survey of cardiology fellowship programs found that only 24% of programs met the Core CV Training Symposium guidelines with a dedicated month rotation in preventive cardiology (16). Although 71% of programs included exposure to cardiac rehabilitation and 37% in lipid management, instruction in weight management (7%), cardiac nutrition (6%) and smoking cessation (5%) were uncommon. Thus, greater incorporation of salutary lifestyle instruction into cardiology fellowship programs as well as in internal medicine, family practice, and other primary care residencies is needed to improve our relatively low rates of healthy behaviors.

References

1. Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, Das SR, de Ferranti S, Després J-P, Fullerton HJ, Howard VJ, Huffman MD, Isasi CR, Jiménez MC, Judd SE, Kissela BM, Lichtman JH, Lisabeth LD, Liu S, Mackey RH, Magid DJ, McGuire DK, Mohler ER III, Moy CS, Muntner P, Mussolino ME, Nasir K, Neumar RW, Nichol G, Palaniappan L, Pandey DK, Reeves MJ, Rodriguez CJ, Rosamond W, Sorlie PD, Stein J, Towfighi A, Turan TN, Virani SS, Woo D, Yeh RW, Turner MB, on behalf of the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics—2016 update: a report from the American Heart Association. Circulation. 2015; 132:000–000. DOI: 10.1161/CIR.0000000000000350
2. Wang Y, Tuomilehto J, Jousilahti P, Antikainen R, Mahonen M, Katzmarzyk PT, Hu G. Lifestyle factors in relation to heart failure among Finnish men and women. Circ Heart Fail. 2011; 4:607–612. [PubMed: 21914814]
3. Agha G, Loucks EB, Tinker LF, Waring ME, Michaud DS, Foraker RE, Li W, Martin LW, Greenland P, Manson JE, Eaton CB. Healthy lifestyle and decreasing risk of heart failure in women:

the Women's Health Initiative observational study. J Am Coll Cardiol. 2014; 64:1777–1785. [PubMed: 25443698]

4. Del Gobbo LC, Kalantarian S, Imamura F, Lemaitre R, Siscovick DS, Psaty BM, Mozaffarian D. Contribution of major lifestyle risk factors for incident heart failure in older adults: The Cardiovascular Health Study. JACC Heart Fail. 2015; 3:520–528. [PubMed: 26160366]
5. Larsson SC, Tectomidis TG, Gigante B, Akesson A, Wolk A. Healthy lifestyle and risk of heart failure: Results from two prospective cohort studies. Circ Heart Fail. 2016; 9:e002855. [PubMed: 27072861]
6. Forman JP, Stampher MJ, Curhan GC. Diet and lifestyle risk factors associated with incident hypertension in women. JAMA. 2009; 302:401–411. [PubMed: 19622819]
7. Knowler WC1, Barrett-Connor E, Fowler SE, Hamman RF, Lachin JM, Walker EA, Nathan DM. Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med. 2002; 346:393–403. [PubMed: 11832527]
8. Menezes AR, Lavie CJ, DeSchutter A, Milani RV, O'Keefe J, DiNicolantonio JJ, Morin DP, Abi-Samra FM. Lifestyle modification in the prevention and treatment of atrial fibrillation. Prog Cardiovasc Dis. 2015; 58:117–125. [PubMed: 26184674]
9. Akesson A, Larsson SC, Discacciati A, Wolk A. Low-risk diet and lifestyle habits in the primary prevention of myocardial infarction in men. A population-based cohort study. J Am Coll Cardiol. 2014; 64:1299–1306. [PubMed: 25257629]
10. Kulshreshta K, Vaccarino V, Judd SE, Howard VI, McClellan WM, Muntner P, Hong Y, Safford MM, Goyal A, Cushman. Life's Simple 7 and risk of incident stroke: the reasons for geographic and racial differences in stroke study. Stroke. 2013; 44:1909–1914. [PubMed: 23743971]
11. Gardener H, Wright CB, Dong C, Cheung K, DeRossa J, Nannery M, Stern Y, Elkind MSV, Sacco RL. Ideal cardiovascular health and cognitive aging in the Northern Manhattan Study. J Am Heart Assoc. 2016; 5:e002731. [PubMed: 26984255]
12. Lloyd-Jones DM, Hong Y, Laberthe D, Mozaffarian D, Appel LKI, Van Horn L, Greenlund K, Daniels S, Nichol G, Tomaselli GF, Arnett DK, Fonarow GC, Ho PM, Lauer MS, Masoudi FA, Robertson RM, Roger GV, Schwam LH, Sorlie P, Yancy CW, Rosamond WD, 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. [PubMed: 20089546]
13. LeFevre M, on behalf of the U.S. Preventive Services Task Force. Behavioral counseling to promote a healthful diet and physical activity for cardiovascular disease prevention in adults with cardiovascular risk factors: U.S. Preventive Services Task Force Recommendation Statement. Ann Intern Med. 2014; 161:356–362. [PubMed: 25003392]
14. Record NB, Onion DK, Prior RE, Dixon DC, Record SS, Fowler BA, Cayer GR, Amos CI, Pearson TA. Community-wide cardiovascular disease prevention programs and health outcomes in a rural County, 1970–2010. JAMA. 2015; 313:147–155. [PubMed: 25585326]
15. Cowley J. Incentives for wellness: tackling issues of effectiveness, biology, scope, and cost shifting. J Policy Anal Manage. 2014; 32:826–832.
16. Pack QR, Keteyian SJ, McBride PE, Weaver WD, Kim HE. Current status of preventive cardiology training among United States cardiology fellowships and comparison to training guidelines. Am J Cardiol. 2012; 110:124–128. [PubMed: 22482864]