

Improving cardiovascular health today to prevent heart failure tomorrow: the importance of a holistic approach

Cristina Madaudo^{1,2}, Daniel Bromage^{1,3}, Giuseppina Novo²,
and Antonio Cannata^{1,3*} 

¹Department of Cardiovascular Sciences, British Heart Foundation Centre of Research Excellence, School of Cardiovascular Medicine, Faculty of Life Sciences and Medicine, King's College London, The James Black Centre, 125 Coldharbour Lane, London SE5 9NU, UK; ²Department of Health Promotion, Mother and Child Care, Internal Medicine and Medical Specialties, Cardiology Unit, University of Palermo, University Hospital P. Giaccone, Palermo, Italy; and ³Cardiology Department, King's College Hospital NHS Foundation Trust, London, UK

Online publish-ahead-of-print 22 January 2024

This editorial refers to 'Life's Essential 8 and heart failure among patients with chronic kidney disease: the Kailuan Cohort Study', by Z. Huo et al., <https://doi.org/10.1093/eurjpc/zwad398>.

'It is tough to make predictions, especially about the future.' Niels Bohr

Cardiovascular diseases are the leading cause of morbidity and mortality worldwide.¹ Contemporary management and pharmacological and device treatments can significantly improve the prognosis of patients with a range of cardiovascular diseases. However, the burden of cardiovascular disease, and especially heart failure (HF), continues to grow.¹ To date, treatment for HF costs ~2% of the global healthcare budget and is expected to rise.¹ Therefore, finding reliable ways to identify patients at risk of developing HF is necessary to allow preventive strategies to be implemented.

Several risk scores have been proposed and validated to identify patients at a higher risk of developing cardiovascular diseases. These scores, such as the SCORE2 (Systematic COronary Risk Evaluation, age 40–69 years) and SCORE2-OP (SCORE2-Older Persons, age 70–89 years), estimate the 10-year risk of cardiovascular disease in healthy subjects based on sex, age, systolic blood pressure, non-HDL cholesterol, and smoking status.² The Life's Essential 8 (LE8) model, a simple metric ranging from 0 to 100 points, is a relatively novel approach to estimating cardiovascular health.³ It is based on the Life's Simple 7 (LS7) score and includes information on diet, physical activity, nicotine exposure, sleep health, body mass index, lipids, glycaemia, and blood pressure (Figure 1). It complements conventional cardiovascular risk factors with variables reflecting cardiometabolic health, as well as less commonly used variables such as poor sleep quality. This score estimates the prevalence of eight cardiovascular risk factors and increases the ability to predict cardiovascular health.

Chronic kidney disease (CKD) and HF are closely related. Both conditions share common risk factors, such as diabetes and hypertension.^{4,5} Chronic kidney disease can promote the development and progression of HF as well as limiting the optimization of guideline directed medical therapy for HF. Similarly, HF and its treatment can

result in CKD.⁶ In this issue of the journal, Huo et al.⁷ report the relationship between the LE8 model and the risk of HF in 16 190 Chinese patients with CKD from the Kailuan study. This study found a strong inverse association between the LE8 cardiovascular health score and the risk of HF among patients with CKD. In this study, incidence rates for HF were substantially lower among patients with CKD and a higher LE8 score compared to those with a lower LE8 score.⁷ Cigarette smoking, blood glucose, blood lipids, and altered blood pressure values were significantly associated with the risk of HF, supporting a pathophysiological role for cardiometabolic health. Conversely, sleep factors had no impact on the risk of HF.

Interestingly, the study population was relatively young, with a mean age of 56 years, and free from cardiovascular disease at enrolment. The findings were more pronounced in younger patients aged ≤65 years compared to older individuals.⁷ This highlights the importance of diligent cardiovascular prevention earlier in life, given the potential to reduce the risk of HF and change the trajectory of the disease.

For patients with CKD, only a few studies have investigated the role of general cardiovascular health and the incidence of adverse events. Most studies used the LS7 score and were mostly inconclusive.^{8,9} The updated LE8 risk score appears to discriminate people with better cardiovascular health, who may not need intensive follow-up, and patients with worse cardiovascular health who might benefit from intensive follow-up or therapeutic intervention.

Although this study is among the first to investigate the association between the LE8 score and the risk of HF among patients with CKD, an important limitation is the application of a risk score derived and validated from a specific population with a different cardiometabolic profile than the one analysed in this manuscript. Further studies are therefore necessary to ascertain the generalizability and to investigate potential sex differences, which may play an important prognostic role in patients with HF.¹⁰

The results presented in this manuscript highlight the importance of adopting LE8 among patients with CKD to prevent HF, emphasizing the critical role of cardiovascular health management in reducing heart

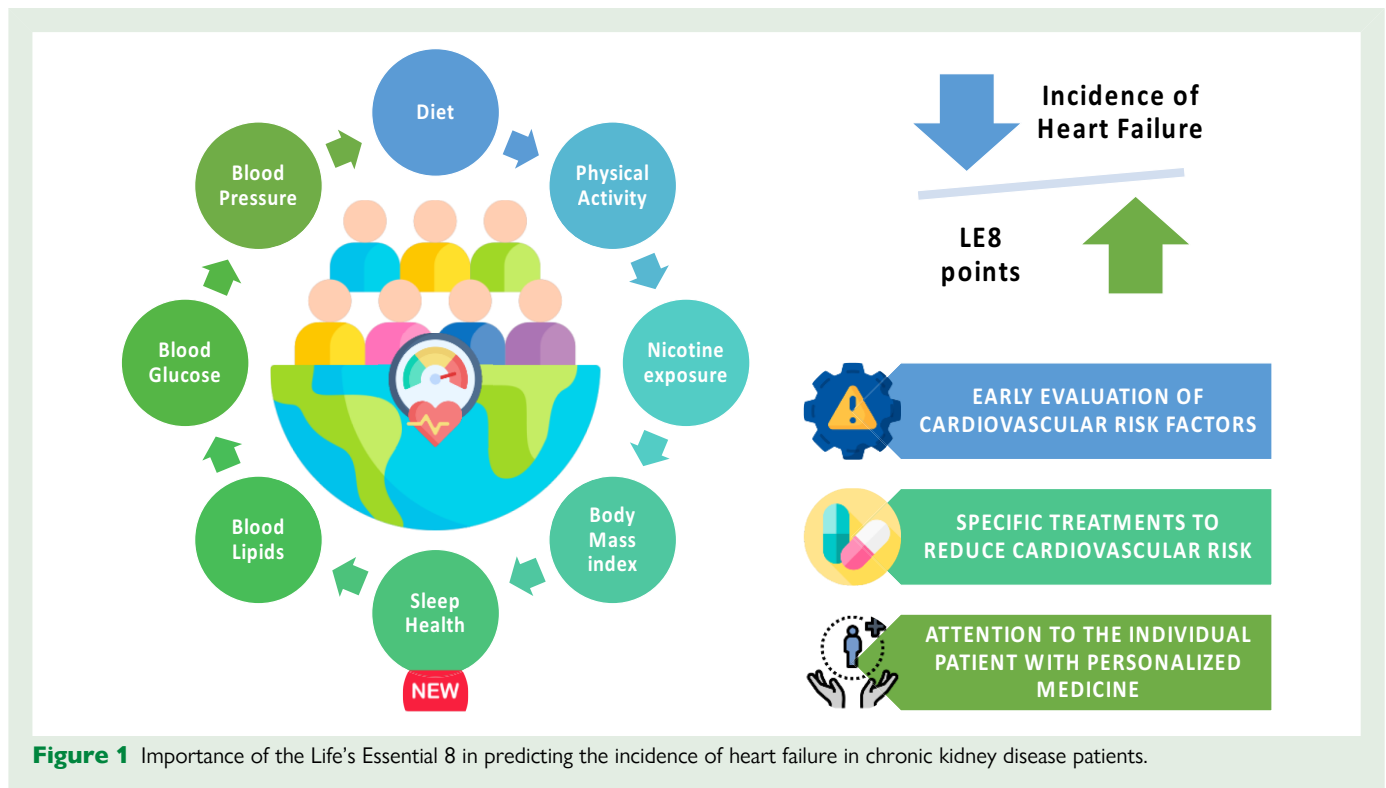


Figure 1 Importance of the Life's Essential 8 in predicting the incidence of heart failure in chronic kidney disease patients.

failure risks in this population. Although LE8 may not accurately classify the different populations like the SCORE, LE8 does not forget young patients in an increasingly at-risk society. Abstaining from cigarette smoking and maintaining good blood pressure, glucose, and cholesterol levels are the right rules for a lower incidence of HF in patients with CKD.

This analysis and the use of LE8 may encourage a change in paradigm from risk factors to 'health factors'. The concept of improving cardiovascular health earlier in life may lead to a reduced incidence of overt cardiovascular disease at a later stage. Encouraging a healthy lifestyle in early adulthood may significantly impact health and healthcare utilization later in life, as well as the global burden of cardiovascular conditions. Including risk scores and models such as the LE8 in daily practice, especially in primary care, may help the prevention of heart HF, particularly among patients with CKD.

In the era of artificial intelligence (AI), we can expect an ever-expanding range of factors that are associated with incident cardiovascular disease. For example, genetic background and eating habits can influence cardiovascular health and may become more readily available for use in risk models with AI technologies. Perhaps, it is time to move from the paradigm of population-oriented medicine towards 'accurate medicine', a holistic approach that brings us closer to identify and correct the factors influencing cardiovascular health. Improving cardiovascular health can significantly reduce the risk of HF, especially in high-risk groups and younger adults, highlighting the public health importance of early prevention.

Conflict of interest: None declared.

References

1. World Health Organization. WHO reveals leading causes of death and disability worldwide: 2000–2019. www.who.int/news/item/09-12-2020-who-reveals-leading-causes-of-death-and-disability-worldwide-2000-2019 (9 December 2020).
2. Visseren FLJ, Mach F, Smulders YM, Carballo D, Koskinas KC, Böck M, et al. 2021 ESC guidelines on cardiovascular disease prevention in clinical practice: developed by the task force for cardiovascular disease prevention in clinical practice with representatives of the European Society of Cardiology and 12 medical societies with the special contribution of the European Association of Preventive Cardiology (EAPC). *Eur Heart J* 2021; **42**:3227–3337.
3. Lloyd-Jones DM, Allen NB, Anderson CAM, Black T, Brewer LC, Foraker RE, et al. Life's essential 8: updating and enhancing the American Heart Association's construct of cardiovascular health: a presidential advisory from the American Heart Association. *Circulation* 2022; **146**:e18–e43.
4. Jankowski J, Floege J, Fiser D, Böhm M, Marx N. Cardiovascular disease in chronic kidney disease: pathophysiological insights and therapeutic options. *Circulation* 2021; **143**: 1157–1172.
5. Scheffold JC, Filippatos G, Hasenfuss G, Anker SD, von Haehling S. Heart failure and kidney dysfunction: epidemiology, mechanisms and management. *Nat Rev Nephrol* 2016; **12**: 610–623.
6. Rangaswami J, Bhalla V, Blair JEA, Chang TI, Costa S, Lentine KL, et al. Cardiorenal syndrome: classification, pathophysiology, diagnosis, and treatment strategies: a scientific statement from the American Heart Association. *Circulation* 2019; **139**: e840–e878.
7. Huo Z, Huang Z, Feng J, Li J, Chen S, Wang G, et al. Life's Essential 8 and heart failure among patients with chronic kidney disease: the Kailuan Cohort Study. *Eur J Prev Cardiol* 2024; **31**:824–831.
8. Ricardo AC, Anderson CA, Yang W, Zhang X, Fischer MJ, Dember LM, et al. Healthy lifestyle and risk of kidney disease progression, atherosclerotic events, and death in CKD: findings from the Chronic Renal Insufficiency Cohort (CRIC) study. *Am J Kidney Dis* 2015; **65**:412–424.
9. Muntner P, Judd SE, Gao L, Gutiérrez OM, Rizk DV, McClellan W, et al. Cardiovascular risk factors in CKD associate with both ESRD and mortality. *J Am Soc Nephrol* 2013; **24**: 1159–1165.
10. Cannatà A, Fabris E, Merlo M, Artico J, Gentile P, Pio Loco C, et al. Sex differences in the long-term prognosis of dilated cardiomyopathy. *Can J Cardiol* 2020; **36**:37–44.