JACC: CARDIOONCOLOGY VOL. 6, NO. 6, 2024

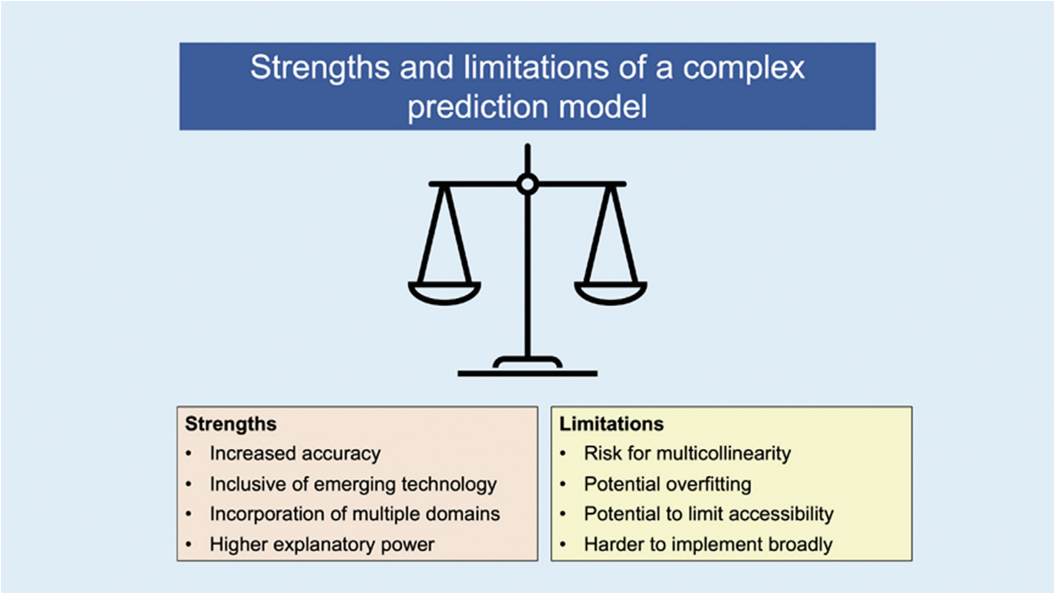
REPLY: Enhancing Life's Essential 8 for Cardiovascular Risk Assessment in Breast Cancer Survivors

We appreciate the insight suggested by Dr Gao and colleagues, to include additional data points to enhance the Life's Essential 8 model accuracy.[1] A key strength of Life's Essential 8 is its focus on domains that are both easily captured and modifiable, offering potential avenues for lifestyle intervention. In real-world practice, we must weigh the potential benefits of a more comprehensive model, which may include advanced data from wearables and inflammatory biomarkers, against the practicalities of implementation in diverse clinical settings using patient-derived measures. Although adding data points may theoretically enhance accuracy, the inclusion of variables that are not universally accessible could limit the model's applicability. For example, biomarkers studied by Ky et al,[2-3] such as high sensitivity C-reactive protein, interleukin-6, and galectin-3, offer profound insights into cardiovascular risk but are not routinely measured in the clinical setting. Additionally, incorporating additional variables must be balanced against the risks of overfitting and multicollinearity to avoid the loss of generalizability and reliability.

The future of cardiovascular care will undoubtedly be shaped by the integration of wearable technology to provide continuous, granular health data. However, key challenges remain. First, wearable data are not yet readily available in clinical cohorts. Second, various platforms capture data differently, and there is currently no universal standard for integration across health care systems. Third, adherence to continuous device usage is often suboptimal.[4] Fourth, the sheer volume of data generated requires careful filtering to distinguish actionable insights from noise. Fifth, protection of health data against misuse and privacy breaches is a concern. Finally, disparities may grow for vulnerable individuals in lower socioeconomic strata or elderly individuals, who may lack the technological proficiency or the means to afford these technologies.

In terms of external validity, we acknowledge the need to consider populations beyond the United States. This underscores the challenge of universally implementing wearables or advanced cardiovascular

FIGURE 1 Strengths and Limitations of a Complex Prediction Model



For prediction models, the comprehensiveness and complexity of the variables should be balanced against the availability of the variables and ability to widely implement the model.

ISSN 2666-0873 https://doi.org/10.1016/j.jaccao.2024.10.003

testing in resource-constrained regions. In these settings, adaptable models not overly reliant on cost-intensive resources may be more practical.

In conclusion, including more data points theoretically may improve model accuracy, but the practical realities of clinical practice necessitate a balance between complexity and usability (**Figure 1**). We should develop and validate tools that are not only effective but also can be readily implemented across diverse health care settings. As technology advances, we anticipate and support greater integration of wearables and biomarkers in transforming our practice. However, further research is needed to inform how best to incorporate emerging technologies without compromising accessibility.

Elena Wadden, MD
Alexi Vasbinder, PhD, RN
Michael S. Simon, MD
Kerryn Reding, PhD, MPH, RN
*__Richard K. Cheng, MD, MS__

*University of Washington
1959 NE Pacific Street
Health Sciences Building
Suite #A506D, Box 356422
Seattle, Washington 98195, USA
E-mail: rkcheng@uw.edu

The authors have reported that they have no relationships relevant to the contents of this paper to disclose.
The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

REFERENCES

1. Wadden E, Vasbinder A, Yogeswaran V, et al. Life's Essential 8 and incident cardiovascular disease in U.S. women with breast cancer. *JACC CardioOncology*. 2024;6(5):746–757. https://doi.org/10.1016/j.jaccao.2024.07.008

2. Narayan V, Thompson EW, Demissei B, Ho JE, Januzzi JL, Ky B. Mechanistic biomarkers informative of both cancer and cardiovascular disease: JACC state-of-the-art review. *J Am Coll Cardiol*. 2020;75(21):2726–2737. https://doi.org/10.1016/J.JACC.2020.03.067

3. Ky B, Putt M, Sawaya H, et al. Early increases in multiple biomarkers predict subsequent cardiotoxicity in patients with breast cancer treated with doxorubicin, taxanes, and trastuzumab. *J Am Coll Cardiol*. 2014;63(8):809–816. https://doi.org/10.1016/J.JACC.2013.10.061

4. Dhingra LS, Aminorroaya A, Oikonomou EK, et al. Use of wearable devices in individuals with or at risk for cardiovascular disease in the US, 2019 to 2020. *JAMA Netw Open*. 2023;6(6):e2316634. https://doi.org/10.1001/JAMANETWORKOPEN.2023.16634