

EDITORIAL



JHH Young Investigator Award 2022: interview with the winner Matthew K. Armstrong

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Journal of Human Hypertension (2024) 38:543; <https://doi.org/10.1038/s41371-024-00918-1>

Could you tell us something about yourself and your unit?

I am a postdoctoral fellow specializing in cardiovascular physiology and epidemiology. I am particularly interested in the health impacts of high blood pressure and large artery dysfunction. One component of my research focuses on developing and refining computational methods for the assessment of large artery hemodynamics with the goal to predict cardiovascular risk earlier and more effectively.

Why did you undertake this research?

My previous research has underscored the detrimental health consequences associated with early-life exposure to cardiovascular risk factors, particularly elevated cholesterol levels. This current study shifts focus to blood pressure, specifically exploring the utility of novel pulse wave analysis techniques—termed pressure-only wave separation analysis—in a cohort of adolescents and young adults. The primary objective of this research was to assess the feasibility of these techniques and to elucidate the potential clinical insights they could offer. By employing these non-invasive methods, we hope to enhance early cardiovascular risk assessment and contribute to preventive health strategies in younger populations.

What did you learn from this research?

This research highlights the effectiveness of approximating aortic flow waveform shapes for deriving wave separation parameters, such as forward and backward pressure wave amplitudes. Our findings reveal that these parameters, especially the forward pressure wave, are significantly correlated with left ventricular mass index, an indicator of heart health. Notably, these associations were observed even without direct measurements of aortic flow. Consequently, our study illustrates the potential of non-invasive techniques to offer valuable insights into cardiovascular risk among adolescents—a group typically not subjected to extensive cardiovascular testing. This approach could enhance early detection and management of cardiovascular risks in younger populations.

Could you expand on the significance of your findings?

Our findings are significant as they propose a novel pulse wave analysis method to assess cardiovascular risk in adolescents.

This approach could be particularly valuable for identifying young individuals at elevated risk of developing cardiovascular diseases in the future, thereby facilitating timely lifestyle or therapeutic interventions. While substantial work remains to be done before these measurements can be integrated into clinical practice, they hold promise for the future, especially in specific high-risk clinical populations. In such cases, these measures could provide crucial physiological and clinical insights that may guide effective cardiovascular risk management strategies.

Can you tell us about any research you're currently undertaking that is related to the paper?

I am the principal investigator of a multidisciplinary pilot study, funded by a University of Iowa Adolescent and Young Adult Cancer Award, assessing vascular function among cancer survivors. This study applies the novel pulse wave analysis techniques discussed in our recent publication to evaluate vascular function in these young cancer survivors. The aim of this project is to improve the early detection of cardiovascular dysfunction in this vulnerable population, which could lead to better health outcomes and quality of life. We expect our study will help reinforce the potential clinical utility of these novel non-invasive pulse wave analysis techniques and emphasize our commitment to translational research and enhancing cardiovascular care in high-risk groups.

Matthew K. Armstrong¹✉

¹Department of Health and Human Physiology, University of Iowa, Iowa City, IA, USA. ✉email: matthew-k-armstrong@uiowa.edu

ADDITIONAL INFORMATION

Correspondence and requests for materials should be addressed to Matthew K. Armstrong.

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