

# Response to the letter concerning the article: “Association between carotid-femoral pulse wave velocity and overall cardiovascular risk score assessed by the SCORE system in urban Polish population”

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Mateusz Podolec<sup>1, 2, 3\*</sup>, Aleksander Siniarski<sup>2, 3\*</sup>, Andrzej Pająk<sup>4</sup>, Paweł Rostoff<sup>2, 3</sup>, Grzegorz Gajos<sup>2, 3</sup>,  
Jadwiga Nessler<sup>2, 3</sup>, Maria Olszowska<sup>3, 5</sup>, Michał Nowakowski<sup>1</sup>, Krystyna Szafraniec<sup>4</sup>, Grzegorz Kopec<sup>3, 5</sup>

<sup>1</sup>Department of Medical Education, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland

<sup>2</sup>Department of Coronary Artery Disease and Heart Failure, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland

<sup>3</sup>John Paul II Hospital, Krakow, Poland

<sup>4</sup>Department of Epidemiology and Population Studies, Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College, Krakow, Poland

<sup>5</sup>Department of Cardiac and Vascular Disease, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland

\*Both authors contributed equally to the study.

We are most grateful to Dr. Floria et al. for showing such an avid interest in our work [1].

As we stated in the abstract and the introduction of the manuscript, the Systemic COronary Risk Estimation (SCORE) model is recommended for the assessment of cardiovascular disease (CVD) death risk in individuals free of CVD, therefore we agree with your comment on it. The link between the SCORE result (assessment of total cardiovascular risk factor estimation) and carotid-femoral pulse wave velocity (CFPWV) is not well documented and indirectly estimates how the latter affects the 10-year risk of death (fatal atherosclerotic event) due to CVDs. Moreover, the aim of our study was to determine the association between CFPWV and SCORE result, and to describe the distribution of CFPWV in the adult, urban Polish population. As mentioned in the manuscript [1], our study participants were citizens of Krakow, Poland (n = 1008) who were free of CVD at the time of enrolment. Afterwards, they were visited at home to complete a structured questionnaire and then invited to a clinic for a physical examination and a profound medical interview to evaluate the comorbidities and medications. As suspected, some of them were diagnosed with CVD after the initial analysis. As stated in the current European Society of Cardiology (ESC) guidelines, total cardio-

vascular risk estimation (SCORE) is recommended for people over 40 years of age, unless they are categorised as high- or very-high-risk based on documented CVD, type 2 diabetes, kidney disease, or a highly elevated single risk factor [2]. In our study, the analysis of SCORE was performed after exclusion of patients with established coronary artery disease or type 2 diabetes. As you have correctly noticed, approximately 60% of subjects with moderate SCORE results have CVD [3]. We agree that more frequent follow-up in these patients is important in the context of avoiding a possibly fatal cardiovascular event.

We are familiar with the 2016 European guidelines on CVD prevention in clinical practice, which currently do not recommend the use of pulse wave velocity (PWV) in routine clinical practice [2]. However, in the same guidelines the authors state that aortic stiffness expressed as PWV is a strong predictor of future cardiovascular events and all-cause mortality [2, 4]. Moreover, our study was started before the new 2016 ESC guidelines were published; therefore, the inclusion criteria and recommendations were based on the previous ESC guidelines. Hence, in our opinion, it seems that in some cases it is worth using CFPWV, at least in the higher-risk population, to assess future cardiovascular events. Moreover, as you correctly noticed, we found a significant positive as-

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#### Address for correspondence:

Mateusz Podolec, MD, PhD, Department of Coronary Artery Disease and Heart Failure, Faculty of Medicine, Jagiellonian University Medical College, ul. Prawdnicza 80, 31-202 Kraków, Poland, tel: +48 12 614 22 18, fax: +48 12 433 43 76, e-mail: podolecmateusz@gmail.com

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sociation between high cardiovascular risk (SCORE > 5%) and high CFPWV. Nevertheless, we agree that identifying new instruments for detecting subclinical organ damage and cardiovascular risk is still desirable.

Finally, as you mentioned, by calculating a cut-off value of CFPWV we wanted to differentiate the high-risk Polish population (SCORE  $\geq$  5%). In our study SCORE  $\geq$  5% independently predicted high CFPWV (in 4.9 years of follow-up), and CFPWV > 11.7 m/s was most valid in relation with high CVD risk. Our result is in line with the 2016 ESC guidelines demonstrating a conservative estimate of significant alterations of aortic function in middle-aged hypertensive patients — 12 m/s [2]; however, hypertension-mediated organ damage can be suspected in patients with CFPWV exceeding 10 m/s [5].

In conclusion, we agree that SCORE risk assessment should be performed in apparently healthy populations. However, despite an in-depth initial clinical evaluation, recognising the condition of “the apparent health” is a challenge. Future studies should focus on the subclinical manifestations of CVD, particularly in asymptomatic individuals.

**Conflict of interest:** none declared

## References

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