Hypertension Research, 41 (3). pp. 176-182. ISSN 0916-9636

DOI: http://dx.doi.org/10.1038/s41440-017-0005-1
EPrint URI: http://eprints.glos.ac.uk/id/eprint/4828

Disclaimer
The University of Gloucestershire has obtained warranties from all depositors as to their title in the material deposited and as to their right to deposit such material.

The University of Gloucestershire makes no representation or warranties of commercial utility, title, or fitness for a particular purpose or any other warranty, express or implied in respect of any material deposited.

The University of Gloucestershire makes no representation that the use of the materials will not infringe any patent, copyright, trademark or other property or proprietary rights.

The University of Gloucestershire accepts no liability for any infringement of intellectual property rights in any material deposited but will remove such material from public view pending investigation in the event of an allegation of any such infringement.
Cardiovascular autonomic nervous system function can be assessed by using an orthostatic challenge to induce arterial wave reflection. While arterial reflection is typically estimated using central augmentation index, a superior estimation can be obtained using pulse wave separation analysis to estimate the aortic backward pressure wave (Pb). However, to be of value in a clinical or research setting, an assessment tool must be precise (reliable). Therefore, this study sought to determine the measurement precision of Pb responses to a modified tilt-table test. Twenty healthy adults (26.4 y (SD 5.2), 24.7 kg/m² (SD 3.8), 55% Female) were tested on three different mornings in a fasted state, separated by a maximum of seven days. Pressure waveforms were recorded on the left arm, and aortic waveforms were generated using a generalized transfer function. Subsequently, a physiologic flow waveform was assumed to separate the aortic pressure wave into its forward and timing-independent backward (Pb) components. The criterion intra-class correlation coefficient of >0.75 was exceeded at baseline (0.79), following 5 min tilt (0.75), and following 5 min recovery from tilt (0.75). The standard error of measurement was 7%. These findings indicate that, in a healthy cohort, the Pb response to an orthostatic challenge can be assessed with acceptable precision. The next step is to determine the sensitivity (validity) of this technique in identifying cardiovascular autonomic dysfunction in patient groups.