

## Number of blood pressure measurements needed to estimate long-term visit-to-visit systolic blood pressure variability for predicting cardiovascular risk: a 10-year retrospective cohort study in a primary care clinic in Malaysia

### ABSTRACT

**Objective:** To determine the reproducibility of visit-to-visit blood pressure variability (BPV) in clinical practice. We also determined the minimum number of blood pressure (BP) measurements needed to estimate long-term visit-to-visit BPV for predicting 10-year cardiovascular (CV) risk. **Design:** Retrospective study **Setting:** A primary care clinic in a university hospital in Malaysia. **Participants:** Random sampling of 1403 patients aged 30 years and above without any CV event at baseline. **Outcomes measures:** The effect of the number of BP measurement for calculation of long-term visit-to-visit BPV in predicting 10-year CV risk. CV events were defined as fatal and non-fatal coronary heart disease, fatal and non-fatal stroke, heart failure and peripheral vascular disease. **Results:** The mean 10-year SD of systolic blood pressure (SBP) for this cohort was  $13.8 \pm 3.5$  mm Hg. The intraclass correlation coefficient (ICC) for the SD of SBP based on the first eight and second eight measurements was 0.38 ( $p < 0.001$ ). In a primary care setting, visit-to-visit BPV (SD of SBP calculated from 20 BP measurements) was significantly associated with CV events (adjusted OR 1.07, 95% CI 1.02 to 1.13,  $p = 0.009$ ). Using SD of SBP from 20 measurement as reference, SD of SBP from 6 measurements (median time 1.75 years) has high reliability (ICC 0.74,  $p < 0.001$ ), with a mean difference of 0.6 mm Hg. Hence, a minimum of six BP measurements is needed for reliably estimating intraindividual BPV for CV outcome prediction. **Conclusion:** Long-term visit-to-visit BPV is reproducible in clinical practice. We suggest a minimum of six BP measurements for calculation of intraindividual visit-to-visit BPV. The number and duration of BP readings to derive BPV should be taken into consideration in predicting long-term CV risk.

**Keyword:** Inverted organic solar cell; Local spectral irradiance; J-V characteristic curve; Power conversion efficiency; Standard AM 1.5 G spectrum; P3HT:PC<sub>61</sub>BM