

## Impact of Blood Pressure Cuff Inflation Rates on Flow-Mediated Dilatation and Contralateral Arm Response

Hsin-Fu Lin, Mandeep Dhindsa, Takashi Tarumi, Steven Miles, Daniel Umpierre, and Hirofumi Tanaka

Department of Kinesiology and Health Education, University of Texas at Austin

Classification of First Author: Doctoral student

### Abstract

Flow-mediated dilatation (FMD) is widely used as an index of nitric oxide-mediated vasodilator function, yet its methodology has not been well established. Previous research indicates that rapid inflations of a blood pressure cuff evoke systemic vasoconstriction as it was observed on non-occluded contralateral arm. This would potentially contribute to the well-known variability of FMD readings and could complicate the emerging evidence that non-occluded contralateral arm responses during the FMD procedure is associated with the presence of coronary artery disease. **Purpose:** To test the hypotheses that fast inflation of a blood pressure cuff could reduce FMD values and influence contralateral vasodilatory states. **Method:** Thirty-three apparently healthy adults (18 males and 15 females,  $29 \pm 6$  years) were studied in two randomized FMD trials. The blood flow-occluding cuff was inflated fast ( $< 1$ s with a Hokanson rapid cuff inflation device) in one trial or slow (over a period of 10s) in the other during the FMD procedure. Arterial diameter, fingertip temperature, and infrared thermal images were obtained throughout each session. **Results:** FMD values were not different between the fast and slow cuff inflation trials ( $5.9 \pm 0.6\%$  vs.  $5.9 \pm 0.4\%$ ). There were no differences in fingertip temperature rebound between the trials ( $1.8 \pm 0.3$  vs.  $1.9 \pm 0.3^\circ\text{C}$ ). The infrared thermal imaging revealed greater reductions in hand and finger temperature as well as more variable responses in the contralateral arm when the cuff was inflated more rapidly. **Conclusion:** Rates to inflate a blood pressure cuff do not appear to affect FMD readings although a fast cuff occlusion would evoke greater neurovascular changes in the non-occluded contralateral arm.