

## Relationship between Step Counts and Carotid Femoral Pulse Wave Velocity in Adults Treated For Hypertension and Diabetes

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**Objectives:** ‘Step counts’ captured by wearable physical activity tracking devices are associated with reductions in cardiovascular disease. However, in individuals on cardioprotective medications the impact of step counts may not be captured by the measurement of traditional cardiometabolic risk factors. To address this gap, we aimed to assess the relationship between pedometer-derived step counts and carotid-femoral pulse wave velocity (cfPWV), a summative measure of arterial health.

**Methods:** 369 adults (46% men, 60% White, mean age 59.6±11.2 years, BMI 31.3±4.5 kg/m<sup>2</sup>) with hypertension and/or type 2 diabetes were recruited in Montreal, Canada (2011-2015). Step counts (Yamax SW-701 pedometer), moderate-to-vigorous physical activity (MVPA) (ActiGraph GT3x+), arterial stiffness (applanation tonometry; SphygmoCor), and cardiometabolic risk factors including blood pressure, haemoglobin A1c, and lipids were assessed.

**Results:** Blood pressure was well controlled (mean 125/77±15/9 mmHg), low-density lipoprotein cholesterol (LDL-C) was close to target (mean 2.5±1.0 mmol/L), and A1c in diabetes was acceptable (mean 7.7±1.3%). Participants averaged 5,125±2,722 steps/day (low active) and mean cfPWV was 9.8±2.2 m/s. Step counts correlated with cfPWV, but not with any other cardiometabolic risk factors. A 1,000 step/day increment was associated with a 0.1m/s (95% CI -0.19, -0.02) decrement in cfPWV in a model adjusted for age, sex, BMI, ethnicity, immigration status, employment, education, diabetes, hypertension, medication classes, and MVPA.

**Conclusion:** In patients with hypertension and/or diabetes who were well-controlled on cardioprotective medications, cfPWV is responsive to step counts and may emerge as a useful health indicator to track the arterial health impact of physical activity strategies in clinical practice.