

## **Non Invasive Diagnosis**

### **Evaluation of Endothelial Function through Pulse Wave Velocity**

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#### **Background**

Endothelial dysfunction occurs early in the development of atherosclerosis and constitutes the pathophysiologic basis of this condition and of cardiovascular disease (CVD). Ultrasound is useful to study endothelial function through the assessment of flow-mediated dilation (FMD). Endothelial function may also be evaluated by the change in pulse wave velocity (PWV) with results that are similar to those obtained by other methods according to the Moens-Korteweg equation.

#### **Objectives**

To evaluate endothelial function through the changes in the carotid-radial PWV before and after inducing ischemia at the level of the brachial artery.

#### **Material and Methods**

Carotid-radial PWV was determined in 24 hypertensive patients (160 women, 63.6±12.3 years and 88 men, 63.1±11.6 years) and in 56 controls (38 women, 63.1±12.6 years and 18 men, 56.1±13.7 years). A reduction in PWV <5% was considered a normal endothelial response. Patients with abnormal response received 5 mg of sublingual isosorbide dinitrate to evaluate endothelium-independent vasodilation for validation of the method.

#### **Results**

An average reduction by 9.3% was recorded in healthy subjects compared to a reduction by 1.5% in hypertensive patients ( $p < 0.0005$ ). The reduction in PWV after the administration of sublingual isosorbide dinitrate was even greater compared to normal subjects (18.2%) ( $p < 0.0001$ ).

#### **Conclusions**

The measurement of carotid-radial PWV before and after inducing ischemia is a reliable method to evaluate endothelial function.