



## RESEARCH TOPIC CLI34

### **Aortic stiffness: exploring the clinical impact of an emerging marker of cardiovascular disease**

#### **Research Area**

Surgical Area

#### **Clinical Unit name**

Vascular and endovascular surgery unit, Istituto Clinico Humanitas

#### **Supervisor**

Civilini

#### **Abstract**

Large arteries' elasticity confers them a cushioning function that buffers cardiac afterload and pulsatile flow at the microvascular level. Arterial stiffness, defined as the resistance of this "vascular cushion" to cardiac pumping deformation, varies with age, vascular diseases and their corresponding treatments. Its etiologic contributors, along with their reciprocal interaction, are still poorly understood [1-2]. Notably, aortic stiffness leads to hypertension, cardiac complications, and end-organ damage, impacting morbidity and mortality [1,3-5]. Current aortic stiffness measurement methods face practical constraints [4], spurring interdisciplinary research for cost-effective tools. Accurately quantifying aortic stiffness and comprehending its underlying causes and consequences are paramount for comprehensive patient care and tailored treatment approaches. Moreover, such insights can prove valuable in vascular pathologies diagnosis and follow-up. This study seeks economically sustainable, widely applicable aortic stiffness measurement methods and deeper understanding of its etiology and implications, advocating for collaborative, cross-disciplinary, efforts to enhance patient care, outcomes, and quality of life.

#### **Scientific references**

1. Chirinos JA, Segers P. Noninvasive evaluation of left ventricular afterload: part 2: arterial pressure-flow and pressure-volume relations in humans. *Hypertension* 2010;56:563–70
2. Van Bakel, T. M. J. et al. Cardiac remodelling following thoracic endovascular aortic repair for descending aortic aneurysms. *Eur J Cardiothorac Surg* 55, 1061 (2019).
3. Sethi, S., Rivera, O., Oliveros, R. & Chilton, R. Aortic stiffness: pathophysiology, clinical implications, and approach to treatment. *Integr Blood Press Control* 7, 29–34 (2014).
4. Chirinos, J. A., Segers, P., Hughes, T. & Townsend, R. Large-Artery Stiffness in Health and Disease: JACC State-of-the-Art Review. *J Am Coll Cardiol* 74, 1237–1263 (2019).



5. O'Rourke MF, Safar ME. Relationship between aortic stiffening and microvascular disease in brain and kidney: cause and logic of therapy. Hypertension 2005;46:200–4.

**Type of contract**

Position not supported by any scholarship or equivalent contract.