 Commentary on Viewpoint: Is left ventricular volume during diastasis the real equilibrium volume, and what is its relationship to diastolic suction?

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TO THE EDITOR: I read with interest the Viewpoint article by Zhang et al. (5). The authors advocated $dPLV / dVLV$ (ventricular pressure/ventricular volume) $<0$ as the necessary and sufficient condition for definition of diastolic suction. This definition guarantees that suction manifests only when ESV (end-systolic volume) $< V_{eq}$ [equilibrium volume (diastasis volume)] and naturally leads to the kinematics-based definition that after the recoil process has terminated, the chamber settles down to the left ventricular volume at diastasis (during this stage of ventricular filling, the pressures of the left atrium and ventricle are nearly equal) at the in vivo equilibrium volume. There are some different definitions of diastolic suction (1–5). In the first one, diastolic suction was described as the left ventricle decreasing its pressure despite its filling during early diastole (2). A second one proposed the capacity of the left ventricle to generate a subatmospheric pressure during early diastole as diastolic suction (1, 3). The last one defined diastolic suction as physiological diastolic intraventricular pressure gradient generated between the apex and the base during early diastole (1). To the second definition, in experimental canine models in which the left ventricle was withheld from filling by ESV clamping, the left ventricular pressure frequently fell below zero; the diastolic suction, which is a major determinant of early left ventricular filling, is caused by the storage of potential energy generated by preceding systolic contraction to below the $V_{eq}$ (4). My opinion is concordant with the authors and I also agreed with this description in the article.

REFERENCES