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Sommario/riassunto

Looking at "Horse in Motion", the iconic photograph by E. Muybridge, it is almost possible to hear the horse galloping. The pounding sound of the hoofs hitting the ground -like a drum- can also echo the rythmic beating of the human heart. That sound, that visceral rhythm, reminds us of the link between motion and performance: the perfectly executed stride of the horse, the incredible coordination of multiscale phenomena behind a heart beat. Furthermore, the decomposed sequence in Muybridge's photograph has become a well-known example of breaking motion into its components over time, and as such is reminiscent of those images that are routinely acquired in clinical practice, where the heart appears dilating and shirnking in a sequence of snapshots. The investigation of this motion and its subtleties is essential for refining our understanding of cardiac function, and the appreciation of how and when this motion is no longer perfectly executed can lead us to understand functional impairments and provide insight into the unfolding of pathology. In the presence of congenital heart disease (CHD), cardiac mechanics are altered: from single ventricle physiology to conduction abnormalities to different cardiomyopathies, it is important to both capture and interpret biomechanical changes that occur in the presence of a congenital defect. This special issue in Frontiers in Pediatrics, now an e-book, focuses on 'Ventricular mechanics in congenital heart disease' and looks at current knowledge of phenomena such as

systolic/diastolic dysfuction and current methods (chiefly in cardiovascular magnetic resonance imaging and echocardiography) to evaluate cardiac function in the presence of CHD, and then presents a series of original studies that employ both medical imaging and computational modelling techniques to study specific CHD scenarios.