

## Echocardiography updates: from cardiac functional assessments to guiding procedures

This special issue of *Cardiovascular Diagnosis and Therapy* focuses on updates in echocardiography. In the current era of multimodality cardiovascular imaging, familiarizing ourselves with the strengths and limitations of each modality and the applicability/utility of each in various disease conditions can help maximize the benefits obtained from the limited healthcare resources that are available.

A predominant clinical application of echocardiography relates to the assessment of diastolic function. In the current special issue, Popovic *et al.* have outlined the pathophysiology of diastolic dysfunction and the role and limitations of echocardiographic assessment in determining left ventricular diastolic dysfunction. Diastolic dysfunction remains the primary characteristic of diabetic cardiomyopathy (Negishi). Furthermore, Gan *et al.* have summarized the assessment of left atrial function using myocardial strain analysis and further discuss a possible imaging biomarker for prognosis.

Right heart evaluation and three-dimensional echocardiography are emerging as topics of interest with respect to current echocardiographic applications. Although a modified Bernoulli equation allows estimation of pressure gradients between cardiac chambers, the accuracy of right atrial pressure estimation has been limited to semi-quantitative assessment. A novel ultrasonographic method to more accurately estimate the right atrial pressure has been presented (Seo *et al.*). Significant progress has been made with respect to right ventricular functional assessment (Wu *et al.*) utilizing both, two- and three-dimensional assessments. Three-dimensional echocardiography enables three-dimensional assessment of left ventricular strain—Muraru *et al.* have summarized its benefits and limitations in detail.

To conclude, this issue also describes several specific procedures and disease conditions. Significant and continuous progress has been made in the field of structural heart disease, where echocardiography is known to play a key role. This issue discusses an updated summary regarding echocardiographic assessments performed in cases of transcatheter aortic valve replacement (TAVR) (Onishi *et al.*) and in cases of MitraClip placement (Cavalcante *et al.*). Additionally, echocardiographic assessment of Kawasaki disease and Takotsubo cardiomyopathy has been updated by Noto *et al.* and Izumo *et al.*, respectively.

These articles will help readers to appreciate a wide variety of current updates in the field of echocardiography. I hope this special issue will interest readers and contribute to a better understanding for utilization of knowledge to improve patients' outcomes.

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