

Editor's Page

The Future of Echocardiography

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In the past decade, we have all witnessed the rise of several new cardiac imaging modalities. Echocardiography was born more than fifty years ago and still has many advantages in clinical practice. It is inexpensive and readily available in the office or at the bedside. The technique continues to play a crucial role in clinical decision making for the management of heart failure, valve disease and arrhythmias. It has become an integral part of modern cardiology and has also benefited from the technological revolution. New modalities and their new applications will bolster the future of echocardiography while reinforcing its position in cardiac imaging.

Beyond its established role as a non-invasive diagnostic tool, echocardiography plays a vital role in the prediction and prevention of age-related cardiovascular outcomes. It is widely known that the magnitude of age-related public health problems, such as atrial fibrillation and heart failure, is enormous and is expected to increase in the future. Echocardiography is safe and effective for the early detection of sub-clinical abnormalities, assisting in the prediction of the clinical risk of cardiovascular events. So far, little is known regarding the impact of left atrial work and diastolic dysfunction on outcomes, and further studies that can provide greater understanding of the cost-effectiveness of population screening are needed.

From a historical point of view, it is worth noting that fifty years ago few physicians would use M-mode to “see” the heart. After intensive efforts, it became

possible to evaluate the characteristics of certain cardiac structures, such as the pericardium, left ventricular size and function, and valvular and congenital anomalies.

However, the diagnostic utility and clinical use of echocardiography took a major leap forward about thirty years ago, with the advent of instruments for real-time tomographic two-dimensional echocardiography. Doppler techniques and transoesophageal echocardiography were the first evolution of echocardiography in cardiac imaging. Moreover, new methods have recently been involved in cardiac imaging and have played a crucial role. Strain, strain rate, speckle tracking, contrast echocardiography, three-dimensional imaging, have led echocardiography to a new revolution and a new path in the twenty-first century. As a result, parameters estimated by echocardiography are now integrated into guidelines as components of clinical decision making in the management of heart failure, valve disease and arrhythmias.

In my opinion, the future of echocardiography will be the hand-held machine, quantification, three-dimensional and contrast imaging. The revolution in computing has improved processing power and enabled device miniaturisation. In addition, echocardiography, combined with other non-invasive imaging techniques, has a pivotal role in patient management. We hope that each imaging modality will have its clinical utility and cost-effectiveness based on specific advantages and disadvantages, as depicted by clinical trials.