Among the new diagnostic methods in cardiology, echocardiography is certainly the most informative. The field has grown so rapidly in recent years that it is almost impossible to keep up with the new technical developments and their application in patient care. The principle of the method is based upon the detection of echoes produced by a beam of short ultrasound pulses transmitted into the heart. Ultrasound is harmless at the energy levels used. The examination can thus readily and repeatedly be used without untoward effects to the patient making it the ideal method for serial analysis and follow-up studies.

It is important to appreciate some distinct differences between echocardiography and X-ray imaging for a better understanding of its specific applications. With ultrasound local changes in acoustic impedance along the sound beam pathway are registered. X-ray techniques register cumulated attenuation of energy along the pathway so that cardiac structures are superimposed in depth and seen as shadows. As a result, the specific details of intracardiac anatomy and pathology such as the attachment and morphology of the atrioventricular valves, the interventricular septum, mass lesions, etc. are better documented with ultrasound that with X-ray techniques.

Since its introduction in 1954 by Edler and Hertz\textsuperscript{1} to the mid 1970's, M-mode echocardiography has been exclusively used and its clinical value and limitations are well established.\textsuperscript{2,3}

The ultrasound beam is aimed manually at selected cardiac structures and a "diagram" showing how the position of these structures change during the cardiac cycle is obtained (time-motion...
display of B-mode or intensity-modulated echoes). The high sampling rate (1,000 transmit-receive cycles/sec) permits recording of rapidly occurring events (e.g. valve opening, closure and fluttering) and facilitates measurement of cardiac dimensions and the analysis of time relationships with other physiological parameters (e.g. simultaneously recorded pulse and pressure tracings). The method however, does not provide information on the spatial relationships of different cardiac structures to each other. This can be accomplished by rapidly and automatically moving the ultrasound beam through a section of the heart to create a "tomographic image" yielding instantaneous structure information and thus cardiac anatomy in motion (Fig. 1).

![Fig. 1. Diagram illustrating the relationship between the two-dimensional and the M-mode echocardiogram.](image)

The spatially oriented display of two-dimensional echocardiography allows information to be appreciated and utilized which is meaningless in the absence of such a spatial reference. This allows a multitude of cardiac cross-sections to be imaged from several chest wall transducer positions (parasternal, apical, subcostal and suprasternal) providing a wealth of diagnostic information. Recently, the American Society of Echocardiography (ASE) has published recommendations for nomenclature and image orientation standards. Such standards obviously are needed to make studies from different laboratories comparable. Building up a two-dimensional image requires time limiting the frame rate which is