

The American Society of Echocardiography (ASE) is an organization of professionals committed to excellence in cardiovascular ultrasound and its application to patient care. The ASE sets forth this document concerning the scope of practice and appropriate standards for training and maintenance of competence in adult transesophageal echocardiography (TEE), an invasive cardiovascular ultrasound imaging modality of the heart and great vessels that provides important information in the management of patients with a wide variety of cardiovascular disease. This statement is based on quality standards that have been developed based on expert consensus. This document has been endorsed by the Society of Cardiovascular Anesthesiologists (SCA), and the American College of Cardiology (ACC), who have either independently or in concert with the ASE previously established training, competency, and practice standards for cardiovascular medicine and perioperative care.

The ASE, ACC and SCA training required to achieve competency in the independent performance and interpretation of TEE has been developed and published widely and used globally.¹⁻⁵ These documents describe the qualifications needed to ensure that the TEE examination is comprehensive, and provides an assessment of cardiac and vascular structure, function and hemodynamics that is matched to the clinical question. The current summary of scope of practice and competency for comprehensive adult TEE outside the perioperative setting are based on the principles contained within these documents and by the considerations below:

Medical Necessity: Like any procedure that poses potential harm and accrues health system cost, formal education on the indications for TEE must be part of a structured curriculum, and is an essential component of Level II training according to the ACC COCATS document on Training in Echocardiography.¹ This training requires knowledge of when TEE is likely to provide information that will complement clinical or other imaging data, and existing recommendations on appropriate use.

Safety: TEE is an invasive procedure with a small but measurable risk of physical injury. Hence formal and extensive training on the relative and absolute contraindications to performing TEE, how to safely insert and manipulate a TEE probe in patients with various levels of sedation, and how to recognize and appropriately manage complications of TEE is necessary.

Medical Knowledge: The scope of practice of TEE is tightly coupled with knowledge of both the technical components of a TEE examination and also the range of pathology that may be encountered. Competency benchmarks include: (1) knowledge of probe/sector manipulation for correctly identifying cardiac structures, (2) ability to recognize and compensate for artifacts, (3) ability to make appropriate adjustments of ultrasound settings that can affect qualitative and quantitative analysis, (4) comprehensive understanding of normal and abnormal cardiovascular pathology, (5) comprehensive knowledge of cardiovascular physiology and hemodynamics that are key to interpretation (e.g. effects of load, heart rate, rhythm/conduction disturbance, external cardiac constraint, chamber interdependence, cardiovascular medications), and (6) knowledge of state-of-the-art approaches to quantitative evaluation. This medical knowledge reduces patient risk by avoiding misinterpretation or incomplete evaluation which can lead to inappropriate decisions for medical care.

Clinical Integration and Patient Care: Results of diagnostic imaging information must be appropriately integrated into the clinical decision-making process, and there must be appropriate storage of images and data, and generation of an accurate report. For most TEEs, the diagnostic images are recorded for later review, at which time a full interpretation and report are generated. A unique feature of TEE performed during surgical or interventional procedures is that the diagnostic information must be reviewed and interpreted immediately, at the point of care, and this interpretation is relied upon to determine the success of the procedure. The training, background and experience to obtain the necessary information and render an accurate and clinically relevant interpretation requires a formal structured training experience and cannot be achieved in limited courses of basic views and pathology.

Based on the considerations above, the ASE endorses training requirements that have already been set forth by the ASE, ACC, and SCA; and which require a solid foundation in general cardiology or cardiovascular anesthesiology, and basic echocardiography. Level II training for cardiologists, which is defined therein, is required for independent performance and interpretation of a comprehensive adult diagnostic TEE. Requirements include completion of a cardiology fellowship, as well as specifically defined, testable competencies. A minimum of 6 months' training in echocardiography which includes hands-on training with personal performance of a *minimum* of 50 full TEE examinations (with 25 independent esophageal intubations) is required *in addition* to 300 transthoracic echocardiograms. The ASE also endorses that training should include an additional 50 TEEs where there is partial performance or bedside instruction of the technical components of TEE and interpretation. The ASE endorses the concept that the numerical benchmarks for TEE are contingent on accredited training in cardiovascular medicine, and the attendant didactic lectures and 6 months of training in the echocardiography laboratory. These experiences provide an exposure to wide array of cardiovascular physiology/pathophysiology, acquired and congenital cardiovascular disease, hemodynamics, anatomic variants, ultrasound methodology, and alternative approaches necessary for competency for comprehensive adult TEE. The ASE also endorses the notion that training be performed in an institution where exposure to a wide variety of pathology is provided and where a minimum of 500 TEEs are performed yearly. Any abbreviated TEE training for focused use must achieve similar high levels of training benchmarks that recommended by experts in the procedure and are matched to scope of practice.

For anesthesiologists performing perioperative TEE for diagnostic or monitoring indications, the SCA and ASA together with ASE have provided defined training requirements. Specific cognitive and technical skills, which are acquired in the course of formal anesthesiology training or practice experience, are similarly outlined in published documents.

Appropriate background and training is necessary to appropriately perform and interpret adult TEE. In addition, the performing clinician must have the training and perspective to interpret the study in the context of the clinical situation; and be licensed to address complications arising from an invasive procedure, which is a key standard for echocardiography laboratory accreditation. Only physicians who have completed training, demonstrate and maintain expertise in the use of TEE and interpretation of the studies, and are credentialed by their hospital specifically for TEE, should perform TEE.

References

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