

# Policy Statements

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## **Guidelines for the Use of Transesophageal Echocardiography (TEE) in the ED for Cardiac Arrest**

*Approved by the ACEP Board of Directors April 2017*

### **Health Courts**

*Revised by the ACEP Board of Directors April 2017*

*Reaffirmed by the ACEP Board of Directors April 2011*

*Originated as CR35 and approved as a policy statement by the ACEP Board of Directors October 2005*

### **Prior Authorization**

*Revised and approved by the ACEP Board of Directors April 2017, April 2010, and February 2003*

### **Civil Commitment**

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### **Physician Credentialing and Delineation of Clinical Privileges in Emergency Medicine**

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### **Optimizing the Treatment of Acute Pain in the Emergency Department**

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## **Guidelines for the Use of Transesophageal Echocardiography (TEE) in the ED for Cardiac Arrest**



[Ann Emerg Med. 2017;70:442-445.]

### **1. INTRODUCTION**

The American College of Emergency Physicians (ACEP) has developed these criteria to assist practitioners performing emergency ultrasound studies (EUS) of the

heart using transesophageal echocardiography (TEE) during cardiac arrest.

Ultrasound has been shown in cardiac arrest to accurately identify the presence or lack of intrinsic cardiac activity and in some cases the cause of arrest, including left ventricular failure, right ventricular failure, pulmonary embolism, pericardial tamponade, and hypovolemia. These findings can lead to lifesaving changes in management such as administration of intravenous fluids, blood products, vasopressors, or thrombolytics, or

performance of a pericardiocentesis. For these reasons, cardiac ultrasound is endorsed by ACEP policy. However, transthoracic echocardiography (TTE) has been shown to have significant limitations in critically ill patients, particularly those in cardiac arrest. TTE image acquisition is technically difficult due to ongoing cardiopulmonary resuscitation (CPR), air in the stomach from bag-valve-mask ventilation, and the presence of defibrillator pads. Furthermore, TTE imaging may prolong pulse checks and lead to reduced coronary perfusion pressure due to inadequate CPR. TEE allows the emergency physician to maintain the standard of an ultrasound-informed resuscitation in the scenario of cardiac arrest, where TTE is significantly limited.

## 2. OBJECTIVES/LIMITATIONS

- a. Objectives
  - i. Identification of presence/absence of cardiac activity
  - ii. Identification of cardiac rhythm
  - iii. Evaluation of left ventricular function
  - iv. Evaluation of right ventricular function
  - v. Identification of pericardial effusion/tamponade
- b. Contraindications
  - i. Esophageal injury or stricture
  - ii. Lack of a definitive airway
- c. Limitations
  - i. Cardiac EUS is a focused examination and does not evaluate all aspects of cardiac function. Some findings that may contribute to hemodynamic compromise but are generally considered outside of the scope of EUS include valvular pathology, diastolic dysfunction, septal defects, and intracardiac thrombus or mass.
  - ii. Examination of the heart may be technically limited by
    1. Inability to pass the TEE into the esophagus
    2. Presence of excessive air in the esophagus
    3. Excessive mitral annular calcification
- d. Pitfalls
  - i. When technical factors prevent an adequate examination, these limitations should be identified and documented. As usual in emergency practice, such limitations may mandate further evaluation by alternative methods, as clinically indicated.
  - ii. Images should be optimized to avoid foreshortening of the ventricles and to include the appropriate structures for each view.
  - iii. Pericardial effusions must be taken into clinical context because small effusions can cause tamponade if accumulated rapidly, whereas large

ones can be well tolerated if they accumulate slowly.

- iv. Clotted hemopericardium may be isoechoic with the myocardium, making it difficult to identify.
- v. Right ventricular failure is not specific to pulmonary embolism, and can be due to pulmonary hypertension or other etiologies such as right-sided myocardial infarction.
- vi. Pleural effusions can be mistaken for pericardial effusions. Multiple views should be used to corroborate findings.
- vii. Fat pads can be mistaken for pericardial effusions, but these are hypoechoic rather than anechoic and limited to the anterior and apical regions of the heart, not circumferential.

## 3. QUALIFICATIONS AND RESPONSIBILITIES OF THE CLINICIAN PERFORMING THE EXAMINATION

Since 2001, clear and succinct ultrasound credentialing recommendations in emergency medicine have been specifically established by the ACEP Ultrasound Guidelines and recommend a benchmark minimum of 25 to 50 quality-reviewed scans per modality to demonstrate technical and interpretive ability. Conversely, for ultrasound-guided procedures, 10 quality-reviewed procedures with ultrasound guidance are recommended. Along the same lines, the guidelines recommend a similar pathway for “different techniques” (such as performing transvaginal ultrasound once competency with transabdominal ultrasound has been achieved). Just as with procedures, if performing a “different technique” for image acquisition, 10 quality-reviewed examinations using that technique are required to establish competency.

TEE credentialing is unique in this regard, such that image interpretation will have already been achieved through credentialing in TTE. In this respect, TEE credentialing is more a question of technical ability and image acquisition. TEE is highly dependent on hand-eye coordination and reliant on image acquisition, making proctoring and standardized direct observational tools ideal for this modality. For this reason, providers seeking credentialing in TEE of cardiac arrest applications should have completed training and met competency standards in TTE and:

- completed a minimum of 2 to 4 hours of TEE-specific continuing medical education or didactics;
- performed a minimum of 10 proctored TEE examinations (including probe insertion) on live patients and simulation models; and
- completed a standardized assessment by a credentialed TEE provider.

#### 4. SPECIFICATIONS FOR INDIVIDUAL EXAMINATIONS

- a. General: Images are obtained and interpreted in real time. Video clips should be recorded rather than still images. Particular attention should be paid to capturing clips during pulse checks in order to evaluate the underlying cardiac function.
- b. Technique
  - i. Real-time scanning technique.
    1. Overview. The goals of this imaging protocol are to limit the complexity of the examination and to maximize the efficiency of the examination and the information acquired. Each of the 3 TEE views has an analogous TTE view with which emergency physicians are already familiar.
    2. Details of technique. The transesophageal probe has 4 possible movements. Rotation can be performed by rotating the probe either clockwise or counterclockwise. The large wheel causes flexion of the probe either anteriorly (anteflexion) or posteriorly (retroflexion), whereas the small wheel causes flexion left or right. The multiplane is controlled by 2 smaller buttons on the TEE probe and adjusts the beam angle anywhere between 0 and 180 degrees. While in the midesophageal position, a multiplane of 0 or 180 degrees is parallel to the diaphragm, whereas 90 degrees is perpendicular to the diaphragm. Probe insertion should be performed cautiously, with care taken to avoid dental trauma and never forced to avoid injury to the oropharynx or esophagus. Neck flexion if possible may ease the passage of the probe if resistance is met.
      - a. The midesophageal 4-chamber view is the first most intuitive view to obtain. After the probe is advanced to the thoracic esophagus, the heart will come into view, and with the multiplane at 0 to 20 degrees, all 4 chambers can be visualized. This view is analogous to the familiar apical 4-chamber view in TTE and is defined by visualizing both the left and right ventricles and atria, as well as the tricuspid and mitral valves in the same plane. Some retroflexion of the probe is usually necessary to avoid foreshortening of the ventricles. This view is useful for evaluation of RV and LV systolic function, as well as size,

- and is the preferred view during a pulse check to visualize the presence or absence of a perfusing rhythm.
- b. The midesophageal long-axis view is obtained by leaving the probe in the same location as the midesophageal 4-chamber, but increasing the multiplane to between 110 and 160 degrees. This view is analogous to the parasternal long-axis view because it is defined by visualizing the mitral and aortic valves in the same plane along with the left atrium, left ventricle, and the outflow tract of the right ventricle. This view is useful for evaluation of left ventricular systolic function, and during compressions helps evaluate compression adequacy and location, with quality compressions causing maximal compression of the LV and opening of the aortic valve.
- c. The transgastric short axis is obtained by first moving the multiplane back to 0 degrees and then advancing the probe into the stomach and anteflexing the probe so that the left ventricle and right ventricle are visualized in cross section. This view is analogous to the parasternal short-axis in TTE, with the difference being the location of the inferior wall closest to the probe in TEE rather than the anterior wall being closest to the probe as in TTE. This view is useful for providing additional information in regard to LV systolic function, evaluation of regional wall motion abnormalities that can suggest acute myocardial infarction, and the presence of septal flattening that can indicate increased right ventricular pressures.

#### 5. DOCUMENTATION

EUS of the heart should be obtained and interpreted by the treating physician and used to guide decisionmaking in real time. These findings should be documented in the medical record. Documentation should include the indication, description of the examination performed, and pertinent findings. Images should be stored as part of the medical record in accordance with facility policy requirements.

#### 6. EQUIPMENT SPECIFICATIONS

A phased-array TEE probe should be used with multiplane capability. Compatibility with the emergency department's existing point-of-care ultrasound equipment is important to ensure before purchase.

## 7. QUALITY CONTROL AND IMPROVEMENTS, SAFETY, INFECTION CONTROL, AND PATIENT EDUCATION

Because TEE probes come into contact with mucous membranes, a high level of disinfection is required after use. Policies and procedures related to quality, safety, infection control, and patient education should be developed in accordance with existing hospital policies for TEE probes.

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### Health Courts



[Ann Emerg Med. 2017;70:445.]

The American College of Emergency Physicians endorses the need for comprehensive litigation reform and supports the concept of health courts as an alternative to the current process.

Health courts use specialized adjudicators, use independent expert witnesses, and produce more predictable damage awards.

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### Prior Authorization



[Ann Emerg Med. 2017;70:445.]

The American College of Emergency Physicians (ACEP) affirms the principle that patients should receive prompt emergency care regardless of payment source or ability to pay.

ACEP asserts that previous authorization rules instituted by third-party payers must not pose a barrier to patients seeking access to timely emergency care. ACEP further asserts that insurance companies have an obligation to pay for necessary evaluation, stabilizing treatments, or appropriate transfer and that an insured patient should be granted the expectation of coverage when seeking emergency care.

Insurance coverage does not affect the obligation of the physician to perform a medical screening examination and provide necessary stabilizing treatment or appropriate transfer, or the financial obligation incurred for such evaluation and care.

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### Civil Commitment



[Ann Emerg Med. 2017;70:445.]

Emergency physicians are often called on to care for patients for whom involuntary commitment may be a consideration. Civil commitment, the term used to describe the only noncriminal process by which the law allows individuals to be detained and their freedom of movement restricted, is applied to persons who, because of psychiatric illness or another disease, pose a danger to themselves or others. The laws delineating and governing this process are state laws, but federal regulations and oversight may also apply.

Commitment involves an infringement of civil liberties and may create special concerns for emergency department personnel. When participating in commitment procedures, the emergency physician should consider the following:

- Aspects of the process of commitment, including relevant laws, regulations, institutional policies, documentation, and patient rights
- Performing an appropriate history and physical examination with appropriate, relevant ancillary diagnostic procedures, and with attention not only to the psychiatric evaluation but also to the possibility of other causative underlying medical problems
- The patient's right to confidentiality and privacy

The American College of Emergency Physicians (ACEP) supports the use of written department guidelines or policies addressing the commitment of emergency patients. ACEP further recognizes the importance of psychiatric and other mental health care professionals in the evaluation of patients who may be in need of commitment, and strongly supports access for patients to appropriate mental health consultation.

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