National Imaging Associates, Inc.*	
Clinical guideline **TRANSESOPHAGEAL (TEE) ECHO**	**Original Date: October 2009**
CPT codes: 93312, 93313, 93314, 93315, 93316, 93317, 93318, +93320, +93321, +93325	**Last Revised Date: March 2021**
Guideline Number: NIA_CG_066	**Implementation Date: January 2022**

GENERAL INFORMATION

It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. All prior relevant imaging results, and the reason that alternative imaging cannot be performed must be included in the documentation submitted

INDICATIONS FOR TRANSESOPHAGEAL ECHOCARDIOGRAPHY (TEE)

General Criteria

(Doherty, 2017; Flachskampf, 2014; Hahn, 2013; Lancelotti, 2013; Ogbara, 2011)

- TEE may be performed after a nondiagnostic transthoracic echocardiogram (TTE) due to inadequate visualization of relevant structures, or if there is a high likelihood of a nondiagnostic TTE

Aortic Pathology

- Suspected acute aortic pathology, such as aortic dissection (Bhave, 2018; Doherty, 2017)
- Dilated aortic sinuses or ascending aorta on TTE
- Evaluation of aortic sinuses, sinotubular junction, or ascending aorta in patients with bicuspid aortic valve when morphology cannot be assessed by TTE, and other imaging including CT or MRI have not been done

Valvular Disease

(Doherty, 2017; Nishimura, 2014)

- Discordance between clinical assessment and TTE assessment of the severity of mitral regurgitation (MR)

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- Evaluation of mitral stenosis, when there is a discrepancy between clinical signs or symptoms, and TTE is inadequate
- Discordance between clinical assessment and TTE assessment of the severity of aortic regurgitation (AR)
- Evaluation of native or prosthetic valves with clinical signs or symptoms suggesting valve dysfunction, when TTE is inadequate
- Re-evaluation of known prosthetic valve dysfunction when it would change management or guide therapy, (and TTE is inadequate)

Infective Endocarditis
(Doherty, 2017; Douglas, 2011; Saric, 2016)

- Suspected infective endocarditis (IE) of native valve, prosthetic valve, or endocardial lead with positive blood culture or new murmur
- Moderate to high pretest probability of IE (i.e.~~,~~ staph bacteremia, fungemia, prosthetic heart valve, or intracardiac device) when TTE is negative
- Re-evaluation of IE in a patient with a change in clinical status or cardiac examination (e.g.~~,~~ new murmur, embolism, persistent fever, heart failure (HF), abscess, or atrioventricular block)
- Re-evaluation of IE if the patient is at high risk for progression/complications or when the findings would alter therapy, when TTE is inadequate

Cardiac Mass or Source of Emboli

- Initial evaluation of patient to exclude cardiac origin of TIA or ischemic stroke (Doherty, 2017~~8~~)
- Evaluation of cardiac mass, suspected tumor, or thrombus (Doherty, 2017; Saric, 2016)
- Re-evaluation of prior TEE finding for interval change (e.g.~~,~~ resolution of thrombus after anticoagulation), when the findings would change therapy

Atrial Fibrillation/Flutter
(Doherty, 2017~~9~~)

- Evaluation for clinical decision-making regarding anticoagulation, cardioversion, and/or radiofrequency ablation

TAVR (Transcatheter Aortic Valve Replacement/Repair)
(Doherty, 2017; Otto, 2017)

- Pre-procedural assessment of annular size and shape, number of cusps, and degree of calcification, when computed tomography (CT) or CMR cannot be performed
- Post~~-~~-procedural assessment of degree of aortic regurgitation (including valvular and paravalvular) with suspicion of valve dysfunction, if TTE is inadequate

Patent Foramen Ovale or Atrial Septal Defect
(Doherty, 2017~~9~~; Sachdeva, 2020)

- Evaluation for anatomy, potential cardiac source of emboli, and suitability for percutaneous device closure
- Evaluation post device closure with clinical concern for infection, malposition, embolization, or persistent shunt

Left Atrial Appendage Occlusion
(Doherty, 2017~~9~~)

- Evaluation for anatomy, potential cardiac source of emboli, and suitability for percutaneous occlusion device placement
- Surveillance at 45 days or FDA guidance/guidelines for follow-up to assess device stability and device leak, and exclude migration, displacement, or erosion

Percutaneous Mitral Valve Repair
(Doherty, 2017)

- Determination of patient eligibility for percutaneous mitral valve procedures
- Pre-procedural evaluation for percutaneous mitral valve procedures may be performed in addition to CT imaging (Wunderlich, 2018)
- To exclude the presence of intracardiac mass, thrombus, or vegetation prior to (within 3 days of) the procedure

Hypertrophic Cardiomyopathy

(Ommen, 2020)

- **When TTE is inconclusive in planning for myectomy, to exclude subaortic membrane or mitral regurgitation, or to assess need for septal ablation**

Adult Congenital Heart Disease
(Sachdeva, 2020; Stout, 2018)

- Imaging with provocative maneuvers (Valsalva, cough) to assess for the presence of right-to-left cardiac shunt
- Evaluation prior to planned repair of the following lesions when TTE, CMR, or CT are not adequate:
    - Isolated secundum atrial septal defect
    - Sinus venosus defect and/or partial anomalous pulmonary venous connection
    - Congenital mitral stenosis or mitral regurgitation
    - Subvalvular aortic stenosis
    - Transposition of the Great Arteries
- Evaluation postoperative or post catheter-based repair due to change in clinical status and/or new concerning signs or symptoms when TTE, CMR, or CT are not adequate

Ventricular Assist Devices
(Doherty, 2017~~9~~; Stainback, 2015)

- Preoperative evaluation of suitability for ventricular assist device (VAD)

- Re-evaluation for VAD-related complication or suspected infection

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BACKGROUND

Transesophageal echocardiography (TEE) enables cardiac ultrasound imaging from within the esophagus, which provides a window for enhanced quality images as well as additional views, beyond that acquired by standard transthoracic echocardiography (TTE).

Abbreviations

AR	aortic regurgitation
CMR	cardiac magnetic resonance
CT(A)	computed tomography (angiography)
IE	infective endocarditis
MR	mitral regurgitation
MRI	magnetic resonance imaging
TEE	transesophageal echocardiography
TTE	transthoracic echocardiography
VAD	ventricular assist device

POLICY HISTORY

Date	Summary
March 2021	• **Added indication and reference for hypertrophic cardiomyopathy**
March 2020	• **Added general information section as Introduction which outlines requirements for documentation of pertinent office notes by a licensed clinician, and inclusion of laboratory testing and relevant imaging results for case review.** • **Added specific indication for initial evaluation of patient to exclude cardiac origin of TIA or ischemic stroke** • **Updated indications for Congenital Heart Disease to include the following:** ○ **Evaluation prior to planned repair of the following lesions when TTE, CMR, or CT are not adequate:** ▪ **Isolated secundum atrial septal defect** ▪ **Sinus venosus defect and/or partial anomalous pulmonary venous connection** ▪ **Congenital mitral stenosis or mitral regurgitation**

	▪ Subvalvular aortic stenosis ▪ Transposition of the Great Arteries ○ Evaluation postoperative or post catheter-based repair due to change in clinical status and/or new concerning signs or symptoms when TTE, CMR, or CT are not adequate • Updated and added new references
July 2019	• For ventricular assist devices added indication for re-evaluation for VAD-related complication or suspected infection • Aortic Pathology section rewritten as follows: ○ Suspected acute aortic pathology such as aortic dissection (Bhave 2018, Doherty 2019) ○ Dilated aortic sinuses or ascending aorta on transthoracic echocardiogram (TTE) ○ Evaluation of aortic sinuses, sinotubular junction, or ascending aorta in patients with bicuspid aortic valve when morphology cannot be assessed by TTE, and other imaging including CT or MRI have not been done • Added infective endocarditis indication for moderate to high pretest probability of IE (i.e. staph bacteremia, fungemia, prosthetic heart valve, or intracardiac device) when TTE is negative • For cardiac mass or source of emboli added indication for re-evaluation of prior TEE finding for interval change (e.g., resolution of thrombus after anticoagulation) when the findings would change therapy • Added indications for Patent Foramen Ovale or Atrial Septal Defect as follows: ○ Evaluation for anatomy, potential cardiac source of emboli, and suitability for percutaneous device closure ○ Evaluation post device closure with clinical concern for infection, malposition, embolization, or persistent shunt • Added indications for Left Atrial Appendage Occlusion as follows: ○ Evaluation for anatomy, potential cardiac source of emboli, and suitability for percutaneous occlusion device placement ○ Surveillance at 45 days or FDA guidance/guidelines for follow-up to assess device stability and device leak, and exclude migration, displacement, or erosion

	• Added indications for Adult Congenital Heart Disease as follows: ○ Imaging with provocative maneuvers (Valsalva, cough) to assess for the presence of right-to-left cardiac shunt ○ Evaluation when TTE, CMR, or CTA are not adequate in the setting of: ▪ Pulmonary venous connections with ASD ▪ Aortic imaging in Williams syndrome or patient suspected of having supravalvular stenosis ▪ Surgical planning for Ebstein's anomaly ▪ Evaluation of baffle leak after atrial switch repair for d-Transposition of the Great Arteries ▪ Removed section on "Frequency of Echo Studies"

~~July 26, 2019~~

- ~~For ventricular assist devices added indication for re-evaluation for VAD-related complication or suspected infection~~
- ~~Aortic Pathology section rewritten as follows:~~
  - ~~Suspected acute aortic pathology such as aortic dissection (Bhave 2018, Doherty 2019)~~
  - ~~Dilated aortic sinuses or ascending aorta on transthoracic echocardiogram (TTE)~~
  - ~~Evaluation of aortic sinuses, sinotubular junction, or ascending aorta in patients with bicuspid aortic valve when morphology cannot be assessed by TTE, and other imaging including CT or MRI have not been done~~
- ~~Added infective endocarditis indication for moderate to high pretest probability of IE (i.e. staph bacteremia, fungemia, prosthetic heart valve, or intracardiac device) when TTE is negative~~
- ~~For cardiac mass or source of emboli added indication for re-evaluation of prior TEE finding for interval change (e.g., resolution of thrombus after anticoagulation) when the findings would change therapy~~
- ~~Added indications for Patent Foramen Ovale or Atrial Septal Defect as follows:~~
  - ~~Evaluation for anatomy, potential cardiac source of emboli, and suitability for percutaneous device closure~~
  - ~~Evaluation post device closure with clinical concern for infection, malposition, embolization, or persistent shunt~~
- ~~Added indications for Left Atrial Appendage Occlusion as follows:~~
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  - ~~Surveillance at 45 days or FDA guidance/guidelines for follow-up to assess device stability and device leak, and exclude migration, displacement, or erosion~~
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- Evaluation when TTE, CMR, or CTA are not adequate in the setting of:
  - Pulmonary venous connections with ASD
  - Aortic imaging in Williams syndrome or patient suspected of having supravalvular stenosis
  - Surgical planning for Ebstein's anomaly
  - Evaluation of baffle leak after atrial switch repair for d-Transposition of the Great Arteries
  - Removed section on "Frequency of Echo Studies"

March 2020

- Added general information section as Introduction which outlines requirements for documentation of pertinent office notes by a licensed clinician, and inclusion of laboratory testing and relevant imaging results for case review.
- Added specific indication for initial evaluation of patient to exclude cardiac origin of TIA or ischemic stroke
- Updated indications for Congenital Heart Disease to include the following:
  - Evaluation prior to planned repair of the following lesions when TTE, CMR, or CT are not adequate:
    - Isolated secundum atrial septal defect
    - Sinus venosus defect and/or partial anomalous pulmonary venous connection
    - Congenital mitral stenosis or mitral regurgitation
    - Subvalvular aortic stenosis
    - Transposition of the Great Arteries
  - Evaluation postoperative or post catheter-based repair due to change in clinical status and/or new concerning signs or symptoms when TTE, CMR, or CT are not adequate
- Updated and added new references

March 2021:

- Added indication and reference for hypertrophic cardiomyopathy

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Reviewed / Approved by NIA Clinical Guideline Committee

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