

In a Heart Beat

A PUBLICATION FROM CARDIOVASCULAR IMAGING CONSULTANTS AT CENTER FOR DIAGNOSTIC IMAGING

Question & Answer

Q: I feel pretty comfortable ordering stress echo evaluations, but I'm not sure when I should be ordering regular echo tests.



Dr. Elizabeth Klodas

A: There are a multitude approved indications for ordering a regular echocardiogram, but the key to deciding whether a resting echo might be useful is if the results of the imaging study will impact care.

Resting Echocardiogram

When should I consider it for my patients?

-Elizabeth Klodas, M.D., F.A.C.C.

There are several common clinical situations where an echo should be strongly considered. These include symptoms of palpitations, shortness of breath, the presence of hypertension, signs or symptoms of heart failure, or the finding of a heart murmur.

A patient who presents with **palpitations** may have a prognosis ranging from extremely favorable to grave, depending upon the underlying rhythm disturbance and cardiac structure/function. The regular echo is extremely useful in all patients with palpitations because a normal echocardiogram automatically places the patient in an extremely favorable group, at low risk for untoward cardiac events. Even the presence of significant ventricular ectopy is associated with a good outcome if the echo is normal. Patients with left ventricular dysfunction or significant valvular disease will have a significantly worse prognosis (further defined by the underlying rhythm disturbance).

Shortness of breath can result from multiple etiologies. For patients in whom the probability of underlying significant coronary disease is low, a resting echo should be ordered to evaluate for cardiac causes of dyspnea. Left ventricular dysfunction, significant valvular disease, or diastolic filling abnormalities can all result in symptoms of breathlessness. For patients in whom underlying coronary disease is suspected, a stress echocardiogram will provide the comprehensive evaluation needed to ascertain the presence of a cardiac etiology. In those patients undergoing a stress nuclear evaluation for dyspnea, a regular echocardiogram should also be ordered because it will add valuable data to the work-up.

Patients with **hypertension** benefit from echocardiographic imaging as an evaluation of adequacy of overall hypertensive control, especially in the setting of borderline BP values. Left ventricular hypertrophy, left atrial enlargement and left ventricular diastolic dysfunction (alone or in combination) all point to an increased hypertensive burden and the need to review the aggressiveness of antihypertensive therapy. Hypertension is the leading reversible cause of heart failure. Early detection and correction of increased hypertensive burden would be expected to improve outcomes.

Patients with signs and symptoms of **heart failure** may have systolic dysfunction, diastolic dysfunction, significant valvular disease, or any combination of the above. Each of these can be defined by a resting echo study. Discerning the primary process(es) underlying heart failure is invaluable in determining the best course of therapy and follow-up.

All patients with a heart murmur should undergo echocardiographic evaluation to determine if their murmur represents valvular disease that requires the institution of SBE prophylaxis and/or closer follow-up.

If you have any further questions about the use of this exam, please feel free to contact me at 952.543.6525 or e-mail me at eklodas@cdirad.com.



Cardiovascular Imaging Consultants at
CENTER FOR DIAGNOSTIC IMAGING

5775 Wayzata Blvd, Suite 190
Minneapolis, MN 55416
tel 952.543.6525

ICD-9 Code	Description of Recognized Indications for Transthoracic Echocardiogram Studies
	SYMPTOMS/COMMON CLINICAL PROBLEMS
362.34	Amaurosis fugax
	Angina - decubitus
413.9	Angina - other and unspecified
413.1	Angina - Prinzmetal's
784.3	Aphasia
786.03	Apnea - excluding sleep apnea
427.5	Cardiac Arrest
V47.2	Cardiorespiratory problem, other
429.9	Cardiovascular disease - unspecified
786.59	Chest pain - other (pressure, tightness, discomfort)
786.52	Chest pain - painful respiration
786.51	Chest pain - precordial
786.50	Chest pain - unspecified
428.0	Congestive heart failure
782.5	Cyanosis
276.51	Dehydration
786.09	Dyspnea
782.3	Edema
V58.11	Encounter for antineoplastic chemotherapy
V58.12	Encounter for antineoplastic immunotherapy
780.6	Fever
276.6	Fluid retention
428.1	Heart failure - left sided
428.9	Heart failure - unspecified
786.3	Hemoptysis
362.33	Hollenhorst plaque
	Hypovolemia
994.6	Motion sickness
786.02	Orthopnea
785.1	Palpitations
V72.81	Preoperative cardiovascular examination
V72.83	Preoperative examination, other
786.00	Respiratory abnormality, unspecified
362.32	Retinal arterial branch occlusion
362.31	Retinal artery occlusion, central
362.33	Retinal artery occlusion, partial
436	Seizure, stroke, other acute but ill-defined cerebrovascular events
786.05	Shortness of breath
780.2	Syncope
435.9	TIA
435.8	Transient cerebral ischemia, other
411.1	Unstable angina
276.50	Volume depletion
	ABNORMAL FINDINGS
794.31	Abnormal ECG
790.7	Bacteremia
429.3	Cardiomegaly
786.04	Cheyne-Stokes breathing
712.87	Dextrocardia
	Heart sounds - abnormal (eg. Friction rub, abnormal cardiac dullness)
786.01	Hyperventilation
458.0	Hypotension - orthostatic
458.8	Hypotension - other

458.9	Hypotension - unspecified
786.7	Lung sounds - abnormal (rubs, abnormal percussion) - excludes wheezing
785.2	Murmur
785.51	Shock, cardiogenic
785.59	Shock, septic
785.50	Shock, unspecified
785.0	Situs inversus
785.0	Tachycardia - unspecified
786.06	Tachypnea
786.07	Wheezing
	CORONARY ARTERY DISEASE
427.71	Acquired ventricular septal defect (post MI)
410.1	Acute myocardial infarction - anterior wall
410.4	Acute myocardial infarction - inferior wall
410.2	Acute myocardial infarction - inferolateral wall
410.3	Acute myocardial infarction - inferoposterior wall
410.5	Acute myocardial infarction - lateral wall
410.8	Acute myocardial infarction - other specified sites (papillary muscle, septum)
410.6	Acute myocardial infarction - true posterior wall
410.9	Acute myocardial infarction - unspecified site
410.0	Acute myocardial infarction - anterolateral wall
414.10	Aneurysm of ventricular wall
429.2	Atherosclerotic cardiovascular disease
414.11	Coronary artery aneurysm
414.02	Coronary artery disease of autologous biological bypass graft, chronic
414.04	Coronary artery disease of internal mammary bypass graft
414.01	Coronary artery disease of native coronary artery, chronic
414.03	Coronary artery disease of nonautologous biological bypass graft, chronic
414.05	Coronary artery disease of unspecified type of bypass graft
414.00	Coronary artery disease of unspecified type of vessel or bypass graft, chronic
414.90	Coronary AV fistula
411.81	Coronary occlusion without infarction
429.79	LV thrombus post MI
412	Myocardial infarction - old
429.81	Papillary muscle disorders
411.0	Postmyocardial infarction syndrome (Dressler's syndrome)
429.6	Rupture of papillary muscle
429.5	Ruptured chordae tendinae
410.7	Subendocardial infarction
411.89	Subendocardial ischemia
	CARDIOMYOPATHY
425.5	Cardiomyopathy - alcoholic
425.3	Cardiomyopathy - endocardial fibroelastosis
425.0	Cardiomyopathy - endomyocardial fibrosis
425.1	Cardiomyopathy - hypertrophic obstructive
425.7	Cardiomyopathy - nutritional/metabolic (amyloid, thyrotoxicosis, beriberi, etc.)
425.4	Cardiomyopathy - primary (congestive, familial, hypertrophic, idiopathic, restrictive, etc.)
425.8	Cardiomyopathy - secondary due to muscular dystrophies or sarcoid
425.9	Cardiomyopathy - secondary, unspecified
429.89	Carditis
429.1	Myocardial degeneration
422.90	Myocarditis - acute due to influenza or tuberculosis
422.91	Myocarditis - acute unspecified
422.91	Myocarditis - idiopathic (giant cell, granulomatous, etc.)
422.99	Myocarditis - other
422.92	Myocarditis - septic

422.93	Myocarditis - toxic
130.3	Myocarditis - toxoplasmosis related
429.0	Myocarditis - unspecified
425.2	Obscure cardiomyopathy of Africa (Becker's disease)
674.53	Peripartum cardiomyopathy, antepartum
674.54	Peripartum cardiomyopathy, postpartum
4	Puerperium complication
	RHYTHM/CONDUCTION ABNORMALITIES
427.31	Atrial fibrillation
427.32	Atrial flutter
426.10	Atrioventricular block, unspecified
426.53	Bilateral bundle branch block, other
426.50	Bundle branch block, unspecified
427.90	Cardiac dysrhythmia, unspecified
426.90	Conduction disorder, unspecified
427.89	Ectopic/nodal atrial rhythm
426.11	First degree AV block
426.6	Heart block, other
426.2	Left anterior or posterior fascicular block
426.3	Left bundle branch block
426.82	Long QT syndrome
426.81	Lown-Ganong-Levine syndrome
426.12	Mobitz II second degree AV block
426.83	Other specified conduction disorders
427.0	Paroxysmal supraventricular tachycardia
427.2	Paroxysmal tachycardia, unspecified
427.1	Paroxysmal ventricular tachycardia
427.69	Premature beats, other
31	Premature beats, supraventricular
30	Premature beats, unspecified
426.52	Right bundle branch block and left anterior fascicular block
426.51	Right bundle branch block and left posterior fascicular block
426.13	Second degree AV block, other
427.81	Sinus node dysfunction, severe (sick sinus syndrome; severe persistent sinus bradycardia)
426.54	Trifascicular block
427.41	Ventricular fibrillation
427.42	Ventricular flutter
427.89	Wandering atrial pacemaker
426.7	Wolff Parkinson White syndrome
	VALVULAR DISEASE
395.0	Aortic stenosis - rheumatic
395.9	Aortic valve disease unspecified - rheumatic
395.1	Aortic valve regurgitation - rheumatic
424.1	Aortic valve stenosis or regurgitation (except rheumatic or if with mitral disease)
395.2	Aortic valve stenosis with regurgitation - rheumatic
746.4	Bicuspid aortic valve
394.9	Mitral valve diseases - other and unspecified
424.0	Mitral valve prolapse
424.0	Mitral valve regurgitation (except rheumatic, or in combination with aortic valve disease)
394.1	Mitral valve regurgitation (rheumatic)
396.3	Mitral valve regurgitation and aortic valve regurgitation (regardless of underlying etiology)
2	Mitral valve regurgitation and aortic valve stenosis (regardless of underlying etiology)
0	Mitral valve stenosis
396.1	Mitral valve stenosis and aortic valve regurgitation (regardless of underlying etiology)
394.2	Mitral valve stenosis with regurgitation
396.0	Mitral valve stenosis and aortic valve stenosis (regardless of underlying etiology)

396.8	Mixed mitral and aortic valve disease with multiple stenosis/regurgitation involvement
996.71	Prosthetic biological heart valve dysfunction
996.02	Prosthetic mechanical heart valve dysfunction
V43.3	Prosthetic valve - mechanical
V42.2	Prosthetic valve - tissue
397.1	Pulmonary valve disease - rheumatic
	Pulmonary valve stenosis or regurgitation (except rheumatic)
397.9	Rheumatic diseases of endocardium, valve unspecified
746.81	Subaortic stenosis
397.0	Tricuspid and/or pulmonic valve disease (rheumatic)
424.2	Tricuspid valve stenosis or regurgitation (except rheumatic)
	CONGENITAL HEART DISEASE
747.29	Aorta congenital aneurysm
747.20	Aorta congenital anomaly, unspecified
747.22	Aorta congenital atresia/stenosis
747.21	Aortic arch congenital anomalies
746.4	Aortic valve congenital insufficiency
746.3	Aortic valve congenital stenosis (not supraaortic or subaortic)
745.61	Atrial septal defect - ostium primum
745.5	Atrial septal defect - ostium secundum
746.4	Bicuspid aortic valve
746.89	Cardiac vein atresia/hypoplasia
746.89	Cardiomegaly, congenital
747.10	Coarctation of aorta
745.0	Common truncus
745.3	Common ventricle
746.9	Congenital anomaly of the heart, unspecified
745.7	Cor biloculare (absence of atrial and ventricular septa)
745.72	Cor triatriatum
745.35	Coronary artery congenital anomaly (anomalous origin, congenital absence, etc.)
745.12	Corrected transposition of great vessels
746.87	Dextrocardia
745.11	Double outlet right ventricle
746.2	Ebstein's anomaly
745.4	Eisenmenger's syndrome
745.69	Endocardial cushion defect - absent atrial septum, AV canal VSD, common AV canal, common atrial septal defect
745.8	Endocardial cushion defect, other
745.60	Endocardial cushion defect, unspecified
745.9	Endocardial cushion defect, unspecified defect of septal closure
747.40	Great vein anomaly, unspecified
746.86	Heart block, congenital, complete or incomplete AV block
746.7	Hypoplastic left heart syndrome
747.11	Interruption of aortic arch
746.89	Left ventricular diverticulum, congenital
746.6	Mitral valve congenital insufficiency
746.5	Mitral valve congenital stenosis (including parachute deformity)
424.0	Mitral valve prolapse
747.42	Partial anomalous pulmonary venous connection
747.0	Patent ductus arteriosus
746.89	Pericardial defect, congenital
747.49	Persistent left superior vena cava
747.49	Persistent posterior cardinal vein
747.3	Pulmonary artery congenital anomalies
747.01	Pulmonary valve atresia
747.00	Pulmonary valve congenital anomaly, unspecified
746.02	Pulmonary valve stenosis, congenital
746.09	Pulmonary valve insufficiency, congenital
747.49	Scimitar syndrome

747.29	Sinus of valsalva aneurysm
759.3	Situs inversus
746.81	Subaortic stenosis
746.83	Subvalvular (infundibular) pulmonic stenosis
745.2	Tetralogy of Fallot
745.10	Transposition of great vessels (complete)
745.9	Transposition of pulmonary veins
746.1	Tricuspid valve congenital atresia/stenosis
747.41	Total anomalous pulmonary venous connection
746.84	Uhl's disease
747.49	Vena cava (superior or inferior) absence/congenital stenosis
745.4	Ventricular septal defect
	HYPERTENSION/PERIPHERAL VASCULAR DISEASE
441.3	Aneurysm of abdominal aorta, ruptured
441.4	Aneurysm of abdominal aorta, without mention of rupture
441.5	Aneurysm of aorta, site unspecified, ruptured
441.9	Aneurysm of aorta, site unspecified, without mention of rupture
441.1	Aneurysm of thoracic aorta, ruptured
441.2	Aneurysm of thoracic aorta, without mention of rupture
441.6	Aneurysm of thoracoabdominal aorta, ruptured
441.7	Aneurysm of thoracoabdominal aorta, without mention of rupture
441.02	Aortic dissection, abdominal
441.01	Aortic dissection, thoracic
441.03	Aortic dissection, thoracoabdominal
441.00	Aortic dissection, unspecified site
440.0	Atherosclerosis of aorta
440.20	Atherosclerosis of extremity arteries
440.9	Basilar artery syndrome
434.91	Cerebral artery occlusion with cerebral infarction, site unspecified
434.90	Cerebral artery occlusion without mention of cerebral infarction, site unspecified
434.11	Cerebral embolism with cerebral infarction
434.10	Cerebral embolism without mention of cerebral infarction
434.01	Cerebral thrombosis with cerebral infarction
434.00	Cerebral thrombosis without mention of cerebral infarction
440.40	Chronic total occlusion of artery of extremity
444.0	Embolism/thrombosis of abdominal aorta
444.81	Embolism/thrombosis of iliac artery
444.22	Embolism/thrombosis of lower extremity artery
444.90	Embolism/thrombosis of other/unspecified peripheral artery
444.1	Embolism/thrombosis of thoracic aorta
444.21	Embolism/thrombosis of upper extremity artery
362.33	Hollenhorst plaque
401.1	Hypertension - essential, benign
401.0	Hypertension - essential, malignant
401.9	Hypertension - essential, unspecified
404.11	Hypertensive heart and renal disease, benign, with congestive heart failure
404.13	Hypertensive heart and renal disease, benign, with congestive heart failure and renal failure
404.12	Hypertensive heart and renal disease, benign, with renal failure
404.10	Hypertensive heart and renal disease, benign, without mention of congestive heart failure or renal failure
404.01	Hypertensive heart and renal disease, malignant, with congestive heart failure
404.03	Hypertensive heart and renal disease, malignant, with congestive heart failure and renal failure
404.02	Hypertensive heart and renal disease, malignant, with renal failure
404.00	Hypertensive heart and renal disease, malignant, without mention of congestive heart failure or renal failure
404.91	Hypertensive heart and renal disease, unspecified, with congestive heart failure
404.93	Hypertensive heart and renal disease, unspecified, with congestive heart failure and renal failure
404.92	Hypertensive heart and renal disease, unspecified, with renal failure
404.90	Hypertensive heart and renal disease, unspecified, without mention of congestive heart failure or renal failure

405.11	Renovascular hypertension, benign
405.01	Renovascular hypertension, malignant
405.91	Renovascular hypertension, unsecified
362.32	Retinal arterial branch occlusion
362.31	Retinal artery occlusion, central
362.33	Retinal artery occlusion, partial
405.9	Secondary hypertension, benign
405.09	Secondary hypertension, malignant
405.99	Secondary hypertension, unsecified
435.2	Subclavian steal syndrome
459.2	Vein compression, vena cava syndrome
435.1	Vertebral artery syndrome
435.3	Vertebrobasilar artery syndrome
	PULMONARY DISORDERS
415.0	Acute cor pulmonale
518.82	Acute pumony insufficiency not elsewhere classified
417.1	Aneurysm of pulmonary artery (acquired)
518.5	ARDS, shock lung
417.0	Arteriovenous fistula of pulmonary vessels (acquired)
416.9	Cor pulmonale/Chronic pulmonary heart disease
417.8	Pulmonary arteritis/endarteritis
417.1	Pulmonary artery aneurysm, acquired
417.8	Pulmonary artery/vein rupture
417.8	Pulmonary artery/vein stricture
417.0	Pulmonary AV fistula, acquired
417.9	Pulmonary circulation, unspecified disease
518.4	Pulmonary edema - acute
415.19	Pulmonary embolus/infarction, acute
415.11	Pulmonary embolus/infarction, acute, iatrogenic
415.0	Pulmonary hypertension - primary
416.8	Pulmonary hypertension - secondary
518.7	Transfusion related acute lung injury (TRALI)
	INFECTIOUS DISORDERS
446.1	Acute febrile moncutaneous lymph node syndrome
518.6	Aspergillosis
790.7	Bacteremia
112.81	Candida endicarditis
999.31	Central venous catheter infection
86.0	Chagas' disease with heart involvement
74.22	Coxsackie endocarditis
74.20	Coxsackie heart disease, unspecified
74.23	Coxsackie myocarditis
74.21	Coxsackie pericarditis
421.9	Endocarditis - acute, unspecified
421.0	Endocarditis, bacterial - acute and subacute
421.1	Endocarditis, infective, due to typhoid, Q fever, or blastomycosis - acute or subacute
424.99	Endocarditis, specified cause, unspecified valve (except rheumatic)
424.90	Endocarditis, unspecified cause, unspecified valve
98.85	Gonococcal heart disease
115.03	Histoplasmosis capsulatum
115.13	Histoplasmosis duboisii
	HIV
V08	HIV asymptomatic
996.61	Infection of prosthetic heart valve, pacemaker/defibrillator components
999.39	Infection post transfusion, injection or vaccination
424.91	Libman-Sacks endocarditis (also code 710.0, lupus erythematosus)

88.81	Lyme disease
998.59	Post operative infection, other
390	Rheumatic fever - without mention of heart involvement (acute or subacute)
391.8	Rheumatic fever, acute, with other or multiple types of heart involvement
391.1	Rheumatic fever, acute, with rheumatic endocarditis
391.2	Rheumatic fever, acute, with rheumatic myocarditis
	Rheumatic fever, acute, with rheumatic pericarditis
391.9	Rheumatic fever, acute, with unspecified heart involvement
398.90	Rheumatic heart disease, unspecified
398.91	Rheumatic heart failure
398.0	Rheumatic myocarditis
393	Rheumatic pericarditis, chronic
38.9	Septicemia
996.51	Seroma, postoperative infected
392.0	Sydenham's chorea with heart involvement
392.9	Sydenham's chorea without mention of heart involvement
93.22	Syphilitic endocarditis, aortic valve
93.21	Syphilitic endocarditis, mitral valve
93.24	Syphilitic endocarditis, mitral valve
93.23	Syphilitic endocarditis, tricuspid valve
93.20	Syphilitic endocarditis, unspecified valve
424.91	Tuberculous endocarditis (also code 017.9, tuberculosis)
	SYSTEMIC DISEASES/ GENETIC DISORDERS
277.3	Amyloidosis
945.1	Angioneurotic edema
265.0	Beriberi
758.0	Down's syndrome
359.1	Duchenne muscular dystrophy
9	Dysmetabolic syndrome, unspecified
0	Friedrich's ataxia, spinocerebellar disease
271.0	Glycogen storage diseases
277.8	Hand-Shuller-Christian disease
282.6	Hemoglobin SS disease without crisis
359.1	Hereditary progressive muscular dystrophies
277.8	Histiocytosis X
359.3	Hypokalemic periodic paralysis
275.0	Iron metabolism disorders
758.7	Klinefelter's syndrome
416.1	Kyphoscoliosis - with heart/lung disease
759.82	Marfan syndrome
277.5	Mucopolysaccharidosis
359.2	Myotonic disorders
238.8	Neoplasm of other site
446.0	Polyarteritis nodosa
135	Sarcoidosis
710.0	Systemic lupus erythematosus
446.7	Takayasu's arteritis
359.4	Toxic myopathy
	COMPLICATIONS OF THERAPY
960.7	Chemotherapy - antineoplastic antibiotics poisoning
V67.51	Follow-up completed therapy with high risk medications
429.4	Functional disturbances following cardiac surgery
1	Poisoning by systemic agents - opium, heroin, methadone
	Radiation effects, unspecified
962.0	Steroids - adrenal cortical steroids poisoning

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