Ambulatory Electrocardiographic (AECG) Monitoring

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➲ Instructions for Use

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Coverage Rationale

Overview

Ambulatory electrocardiographic (AECG) diagnostic procedures provide a record of the heart rhythm during daily activities. AECG can often identify the existence and determine the frequency of clinically significant rhythm disturbances and waveform abnormalities that are missed on a standard electrocardiogram (ECG).

AECG continues to advance at a rapid pace and incorporates various monitoring devices and indications for use. These devices range from Holter monitors, event recorders/monitors, patch recorders, external loop recorders, mobile cardiovascular telemetry, mobile cardiovascular outpatient telemetry, and insertable cardiac monitor/implantable loop recorders. They are differentiated by capabilities and the varying technical components among devices, such as intermittent/continuous recording, patient/rhythm activated recording, number of leads, time frames of use, and whether the rhythm is interpreted in real time (attended surveillance) or if it is transferred from the device and interpreted at a later time.

CMS National Coverage Determinations (NCDs)

A National Coverage Determination (NCD) exists for electrocardiographic services. For coverage guidelines, refer to the NCD for Electrocardiographic Services (20.15).

CMS Local Coverage Determinations (LCDs) and Articles

Local Coverage Determinations (LCDs)/Local Coverage Articles (LCAs) exist and compliance with these policies is required where applicable. For specific LCDs/LCAs, refer to the table for Ambulatory Electrocardiographic (AECG) Monitoring.

For coverage guidelines for states/territories with no LCDs/LCAs, for uses of event monitors, Holter monitors, outpatient cardiac telemetry, and patch recorders not specifically addressed by the NCD for Electrocardiographic Services (20.15), refer to the rationale below:

- AECG monitoring, when performed with a device that has FDA clearance, will be considered reasonable and necessary in any of the following situations:
  - A standard 12-lead electrocardiograph (ECG), complete cardiac history, and cardiac exam has not satisfactorily explained the patient's cardiac complaints and AECG testing will provide diagnostic information that will assist in developing a treatment plan or changing a treatment plan for patients that are at risk for cardiac arrythmias

- For patients experiencing unexplained syncope (lightheadedness), near syncope, vertigo (dizziness), chest pain, palpitations, and/or dyspnea (shortness of breath)
- For patients experiencing nocturnal arrhythmias
- To assess documented or suspected bradycardia
- To assess the average heart rate and adequacy of rate control in a patient with atrial fibrillation
- To evaluate patient response to initiation, revision, or discontinuation of arrhythmic drug therapy
- To detect arrhythmias post ablation procedures
- To evaluate prognosis following Acute Coronary Syndrome
- Pre/post implantable cardiac defibrillator reprogramming
- To assess for Silent Myocardial Ischemia in a patient with known or suspected coronary heart disease.
- To assess for asymptomatic ventricular premature beats or non-sustained ventricular tachycardia in patients with hypertrophic cardiomyopathy, arrhythmogenic right ventricular cardiomyopathy, long QT syndrome, dilated or restrictive cardiomyopathy, congenital heart disease, or Brugada syndrome
- To evaluate for occult atrial fibrillation (A-Fib) as a potential cause of cardio-embolism in patients with cryptogenic stroke

Note: A 24-48 hour monitor is most appropriate for patients with daily or near daily symptoms. Otherwise, providers should order the most appropriate type of AECG for the patient based on their evaluation of the patient, the patient's symptoms, and the devices' labeled indications.

- The following are considered not reasonable and necessary:
  - Devices that do not have FDA clearance
  - Any 24-Hour Monitoring Station that does not meet the definition in the Definitions section

For coverage guidelines for implantable loop recorders, refer to the UnitedHealthcare Commercial Medical Policy titled Implantable Loop Recorders and Wearable Heart Rhythm Monitors for clinical coverage guidance.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service; however, language may be included in the listing below to indicate if a code is non-covered. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CPT Code	Description
Event Monitor	
93268	External patient and, when performed, auto activated electrocardiographic rhythm derived event recording with symptom-related memory loop with remote download capability up to 30 days, 24-hour attended monitoring; includes transmission, review and interpretation by a physician or other qualified health care professional
93270	External patient and, when performed, auto activated electrocardiographic rhythm derived event recording with symptom-related memory loop with remote download capability up to 30 days, 24-hour attended monitoring; recording (includes connection, recording, and disconnection)
93271	External patient and, when performed, auto activated electrocardiographic rhythm derived event recording with symptom-related memory loop with remote download capability up to 30 days, 24-hour attended monitoring; transmission and analysis
93272	External patient and, when performed, auto activated electrocardiographic rhythm derived event recording with symptom-related memory loop with remote download capability up to 30 days, 24-hour attended monitoring; review and interpretation by a physician or other qualified health care professional
Holter Monitor	
93224	External electrocardiographic recording up to 48 hours by continuous rhythm recording and storage; includes recording, scanning analysis with report, review and interpretation by a physician or other qualified health care professional

CPT Code	Description
Holter Monitor	
93225	External electrocardiographic recording up to 48 hours by continuous rhythm recording and storage; recording (includes connection, recording, and disconnection)
93226	External electrocardiographic recording up to 48 hours by continuous rhythm recording and storage; scanning analysis with report
93227	External electrocardiographic recording up to 48 hours by continuous rhythm recording and storage; review and interpretation by a physician or other qualified health care professional
Implantable Loop Recorder	
33285	Insertion, subcutaneous cardiac rhythm monitor, including programming
Outpatient Cardiac Telemetry	
93228	External mobile cardiovascular telemetry with electrocardiographic recording, concurrent computerized real time data analysis and greater than 24 hours of accessible ECG data storage (retrievable with query) with ECG triggered and patient selected events transmitted to a remote attended surveillance center for up to 30 days; review and interpretation with report by a physician or other qualified health care professional
93229	External mobile cardiovascular telemetry with electrocardiographic recording, concurrent computerized real time data analysis and greater than 24 hours of accessible ECG data storage (retrievable with query) with ECG triggered and patient selected events transmitted to a remote attended surveillance center for up to 30 days; technical support for connection and patient instructions for use, attended surveillance, analysis and transmission of daily and emergent data reports as prescribed by a physician or other qualified health care professional
Patch Recorder	
93241	External electrocardiographic recording for more than 48 hours up to 7 days by continuous rhythm recording and storage; includes recording, scanning analysis with report, review and interpretation
93242	External electrocardiographic recording for more than 48 hours up to 7 days by continuous rhythm recording and storage; recording (includes connection and initial recording)
93243	External electrocardiographic recording for more than 48 hours up to 7 days by continuous rhythm recording and storage; scanning analysis with report
93244	External electrocardiographic recording for more than 48 hours up to 7 days by continuous rhythm recording and storage; review and interpretation
93245	External electrocardiographic recording for more than 7 days up to 15 days by continuous rhythm recording and storage; includes recording, scanning analysis with report, review and interpretation
93246	External electrocardiographic recording for more than 7 days up to 15 days by continuous rhythm recording and storage; recording (includes connection and initial recording)
93247	External electrocardiographic recording for more than 7 days up to 15 days by continuous rhythm recording and storage; scanning analysis with report
93248	External electrocardiographic recording for more than 7 days up to 15 days by continuous rhythm recording and storage; review and interpretation
0937T	External electrocardiographic recording for greater than 15 days up to 30 days by continuous rhythm recording and storage; including recording, scanning analysis with report, review and interpretation by a physician or other qualified health care professional (Effective 01/01/2025)
0938T	External electrocardiographic recording for greater than 15 days up to 30 days by continuous rhythm recording and storage; recording (including connection and initial recording) (Effective 01/01/2025)
0939T	External electrocardiographic recording for greater than 15 days up to 30 days by continuous rhythm recording and storage; scanning analysis with report (Effective 01/01/2025)
0940T	External electrocardiographic recording for greater than 15 days up to 30 days by continuous rhythm recording and storage; review and interpretation by a physician or other qualified health care professional (Effective 01/01/2025)

HCPCS Code	Description
Implantable Loop Recorder	
E0616	Implantable cardiac event recorder with memory, activator, and programmer

Diagnosis Code	Description
For CPT Codes 93224, 93225, 93226, and 93227	
G45.0	Vertebro-basilar artery syndrome
G45.1	Carotid artery syndrome (hemispheric)
G45.2	Multiple and bilateral precerebral artery syndromes
G45.3	Amaurosis fugax
G45.4	Transient global amnesia
G45.8	Other transient cerebral ischemic attacks and related syndromes
G45.9	Transient cerebral ischemic attack, unspecified
G90.01	Carotid sinus syncope
I20.0	Unstable angina
I20.1	Angina pectoris with documented spasm
I20.81	Angina pectoris with coronary microvascular dysfunction
I20.89	Other forms of angina pectoris
I21.01	ST elevation (STEMI) myocardial infarction involving left main coronary artery
I21.02	ST elevation (STEMI) myocardial infarction involving left anterior descending coronary artery
I21.09	ST elevation (STEMI) myocardial infarction involving other coronary artery of anterior wall
I21.11	ST elevation (STEMI) myocardial infarction involving right coronary artery
I21.19	ST elevation (STEMI) myocardial infarction involving other coronary artery of inferior wall
I21.21	ST elevation (STEMI) myocardial infarction involving left circumflex coronary artery
I21.29	ST elevation (STEMI) myocardial infarction involving other sites
I21.4	Non-ST elevation (NSTEMI) myocardial infarction
I21.9	Acute myocardial infarction, unspecified
I21.A1	Myocardial infarction type 2
I21.A9	Other myocardial infarction type
I21.B	Myocardial infarction with coronary microvascular dysfunction
I22.0	Subsequent ST elevation (STEMI) myocardial infarction of anterior wall
I22.1	Subsequent ST elevation (STEMI) myocardial infarction of inferior wall
I22.2	Subsequent non-ST elevation (NSTEMI) myocardial infarction
I22.8	Subsequent ST elevation (STEMI) myocardial infarction of other sites
I23.7	Postinfarction angina
I24.0	Acute coronary thrombosis not resulting in myocardial infarction
I24.1	Dressler's syndrome
I24.81	Acute coronary microvascular dysfunction
I24.89	Other forms of acute ischemic heart disease
I25.10	Atherosclerotic heart disease of native coronary artery without angina pectoris
I25.110	Atherosclerotic heart disease of native coronary artery with unstable angina pectoris
I25.111	Atherosclerotic heart disease of native coronary artery with angina pectoris with documented spasm
I25.112	Atherosclerotic heart disease of native coronary artery with refractory angina pectoris
I25.118	Atherosclerotic heart disease of native coronary artery with other forms of angina pectoris
I25.2	Old myocardial infarction
I25.3	Aneurysm of heart
I25.41	Coronary artery aneurysm

Diagnosis Code	Description
For CPT Codes 93224, 93225, 93226, and 93227	
I25.5	Ischemic cardiomyopathy
I25.6	Silent myocardial ischemia
I25.700	Atherosclerosis of coronary artery bypass graft(s), unspecified, with unstable angina pectoris
I25.701	Atherosclerosis of coronary artery bypass graft(s), unspecified, with angina pectoris with documented spasm
I25.702	Atherosclerosis of coronary artery bypass graft(s), unspecified, with refractory angina pectoris
I25.708	Atherosclerosis of coronary artery bypass graft(s), unspecified, with other forms of angina pectoris
I25.710	Atherosclerosis of autologous vein coronary artery bypass graft(s) with unstable angina pectoris
I25.711	Atherosclerosis of autologous vein coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.712	Atherosclerosis of autologous vein coronary artery bypass graft(s) with refractory angina pectoris
I25.718	Atherosclerosis of autologous vein coronary artery bypass graft(s) with other forms of angina pectoris
I25.720	Atherosclerosis of autologous artery coronary artery bypass graft(s) with unstable angina pectoris
I25.721	Atherosclerosis of autologous artery coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.722	Atherosclerosis of autologous artery coronary artery bypass graft(s) with refractory angina pectoris
I25.728	Atherosclerosis of autologous artery coronary artery bypass graft(s) with other forms of angina pectoris
I25.730	Atherosclerosis of non-autologous biological coronary artery bypass graft(s) with unstable angina pectoris
I25.731	Atherosclerosis of non-autologous biological coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.732	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with refractory angina pectoris
I25.738	Atherosclerosis of non-autologous biological coronary artery bypass graft(s) with other forms of angina pectoris
I25.750	Atherosclerosis of native coronary artery of transplanted heart with unstable angina
I25.751	Atherosclerosis of native coronary artery of transplanted heart with angina pectoris with documented spasm
I25.752	Atherosclerosis of native coronary artery of transplanted heart with refractory angina pectoris
I25.758	Atherosclerosis of native coronary artery of transplanted heart with other forms of angina pectoris
I25.760	Atherosclerosis of bypass graft of coronary artery of transplanted heart with unstable angina
I25.761	Atherosclerosis of bypass graft of coronary artery of transplanted heart with angina pectoris with documented spasm
I25.762	Atherosclerosis of bypass graft of coronary artery of transplanted heart with refractory angina pectoris
I25.768	Atherosclerosis of bypass graft of coronary artery of transplanted heart with other forms of angina pectoris
I25.790	Atherosclerosis of other coronary artery bypass graft(s) with unstable angina pectoris
I25.791	Atherosclerosis of other coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.792	Atherosclerosis of other coronary artery bypass graft(s) with refractory angina pectoris
I25.798	Atherosclerosis of other coronary artery bypass graft(s) with other forms of angina pectoris
I25.810	Atherosclerosis of coronary artery bypass graft(s) without angina pectoris
I25.811	Atherosclerosis of native coronary artery of transplanted heart without angina pectoris
I25.812	Atherosclerosis of bypass graft of coronary artery of transplanted heart without angina pectoris

Diagnosis Code	Description
For CPT Codes 93224, 93225, 93226, and 93227	
I25.82	Chronic total occlusion of coronary artery
I25.83	Coronary atherosclerosis due to lipid rich plaque
I25.84	Coronary atherosclerosis due to calcified coronary lesion
I25.85	Chronic coronary microvascular dysfunction
I25.89	Other forms of chronic ischemic heart disease
I42.0	Dilated cardiomyopathy
I42.1	Obstructive hypertrophic cardiomyopathy
I42.2	Other hypertrophic cardiomyopathy
I42.3	Endomyocardial (eosinophilic) disease
I42.4	Endocardial fibroelastosis
I42.5	Other restrictive cardiomyopathy
I42.6	Alcoholic cardiomyopathy
I42.7	Cardiomyopathy due to drug and external agent
I42.8	Other cardiomyopathies
I43	Cardiomyopathy in diseases classified elsewhere
I44.0	Atrioventricular block, first degree
I44.1	Atrioventricular block, second degree
I44.2	Atrioventricular block, complete
I44.39	Other atrioventricular block
I44.4	Left anterior fascicular block
I44.5	Left posterior fascicular block
I44.69	Other fascicular block
I44.7	Left bundle-branch block, unspecified
I45.0	Right fascicular block
I45.19	Other right bundle-branch block
I45.2	Bifascicular block
I45.3	Trifascicular block
I45.4	Nonspecific intraventricular block
I45.5	Other specified heart block
I45.6	Pre-excitation syndrome
I45.81	Long QT syndrome
I45.89	Other specified conduction disorders
I46.2	Cardiac arrest due to underlying cardiac condition
I46.8	Cardiac arrest due to other underlying condition
I47.0	Re-entry ventricular arrhythmia
I47.10	Supraventricular tachycardia, unspecified
I47.11	Inappropriate sinus tachycardia, so stated
I47.19	Other supraventricular tachycardia
I47.20	Ventricular tachycardia, unspecified
I47.21	Torsades de pointes
I47.29	Other ventricular tachycardia
I47.9	Paroxysmal tachycardia, unspecified
I48.0	Paroxysmal atrial fibrillation
I48.11	Longstanding persistent atrial fibrillation

Diagnosis Code	Description
For CPT Codes 93224, 93225, 93226, and 93227	
I48.19	Other persistent atrial fibrillation
I48.20	Chronic atrial fibrillation, unspecified
I48.21	Permanent atrial fibrillation
I48.3	Typical atrial flutter
I48.4	Atypical atrial flutter
I48.91	Unspecified atrial fibrillation
I48.92	Unspecified atrial flutter
I49.01	Ventricular fibrillation
I49.02	Ventricular flutter
I49.1	Atrial premature depolarization
I49.2	Junctional premature depolarization
I49.3	Ventricular premature depolarization
I49.49	Other premature depolarization
I49.5	Sick sinus syndrome
I49.8	Other specified cardiac arrhythmias
I5A	Non-ischemic myocardial injury (non-traumatic)
I63.10	Cerebral infarction due to embolism of unspecified precerebral artery
I63.111	Cerebral infarction due to embolism of right vertebral artery
I63.112	Cerebral infarction due to embolism of left vertebral artery
I63.113	Cerebral infarction due to embolism of bilateral vertebral arteries
I63.119	Cerebral infarction due to embolism of unspecified vertebral artery
I63.12	Cerebral infarction due to embolism of basilar artery
I63.131	Cerebral infarction due to embolism of right carotid artery
I63.132	Cerebral infarction due to embolism of left carotid artery
I63.133	Cerebral infarction due to embolism of bilateral carotid arteries
I63.139	Cerebral infarction due to embolism of unspecified carotid artery
I63.19	Cerebral infarction due to embolism of other precerebral artery
I63.40	Cerebral infarction due to embolism of unspecified cerebral artery
I63.411	Cerebral infarction due to embolism of right middle cerebral artery
I63.412	Cerebral infarction due to embolism of left middle cerebral artery
I63.413	Cerebral infarction due to embolism of bilateral middle cerebral arteries
I63.419	Cerebral infarction due to embolism of unspecified middle cerebral artery
I63.421	Cerebral infarction due to embolism of right anterior cerebral artery
I63.422	Cerebral infarction due to embolism of left anterior cerebral artery
I63.423	Cerebral infarction due to embolism of bilateral anterior cerebral arteries
I63.429	Cerebral infarction due to embolism of unspecified anterior cerebral artery
I63.431	Cerebral infarction due to embolism of right posterior cerebral artery
I63.432	Cerebral infarction due to embolism of left posterior cerebral artery
I63.433	Cerebral infarction due to embolism of bilateral posterior cerebral arteries
I63.439	Cerebral infarction due to embolism of unspecified posterior cerebral artery
I63.441	Cerebral infarction due to embolism of right cerebellar artery
I63.442	Cerebral infarction due to embolism of left cerebellar artery
I63.443	Cerebral infarction due to embolism of bilateral cerebellar arteries
I63.449	Cerebral infarction due to embolism of unspecified cerebellar artery

Diagnosis Code	Description
For CPT Codes 93224, 93225, 93226, and 93227	
I63.49	Cerebral infarction due to embolism of other cerebral artery
I63.9	Cerebral infarction, unspecified
I97.120	Postprocedural cardiac arrest following cardiac surgery
I97.121	Postprocedural cardiac arrest following other surgery
I97.190	Other postprocedural cardiac functional disturbances following cardiac surgery
I97.191	Other postprocedural cardiac functional disturbances following other surgery
Q20.3	Discordant ventriculoarterial connection
Q20.5	Discordant atrioventricular connection
Q20.8	Other congenital malformations of cardiac chambers and connections
Q20.9	Congenital malformation of cardiac chambers and connections, unspecified
Q21.11	Secundum atrial septal defect
Q21.12	Patent foramen ovale
Q21.13	Coronary sinus atrial septal defect
Q21.21	Partial atrioventricular septal defect
Q21.22	Transitional atrioventricular septal defect
Q21.23	Complete atrioventricular septal defect
Q21.3	Tetralogy of Fallot
Q24.6	Congenital heart block
R00.0	Tachycardia, unspecified
R00.1	Bradycardia, unspecified
R00.2	Palpitations
R00.8	Other abnormalities of heart beat
R06.00	Dyspnea, unspecified
R06.01	Orthopnea
R06.02	Shortness of breath
R06.03	Acute respiratory distress
R06.09	Other forms of dyspnea
R06.2	Wheezing
R06.3	Periodic breathing
R06.4	Hyperventilation
R06.81	Apnea, not elsewhere classified
R06.82	Tachypnea, not elsewhere classified
R06.83	Snoring
R06.89	Other abnormalities of breathing
R07.1	Chest pain on breathing
R07.2	Precordial pain
R07.82	Intercostal pain
R07.89	Other chest pain
R07.9	Chest pain, unspecified
R10.13	Epigastric pain
R29.5	Transient paralysis
R40.4	Transient alteration of awareness
R42	Dizziness and giddiness
R55	Syncope and collapse

Diagnosis Code	Description
For CPT Codes 93224, 93225, 93226, and 93227	
Z79.85	Long-term (current) use of injectable non-insulin antidiabetic drugs
Z79.891	Long term (current) use of opiate analgesic
Z79.899	Other long term (current) drug therapy
Z86.73	Personal history of transient ischemic attack (TIA), and cerebral infarction without residual deficits
Z86.74	Personal history of sudden cardiac arrest
For CPT Codes 93228, 93229, 93268, 93270, 93271, and 93272	
G45.0	Vertebro-basilar artery syndrome
G45.1	Carotid artery syndrome (hemispheric)
G45.2	Multiple and bilateral precerebral artery syndromes
G45.3	Amaurosis fugax
G45.4	Transient global amnesia
G45.8	Other transient cerebral ischemic attacks and related syndromes
G45.9	Transient cerebral ischemic attack, unspecified
G90.01	Carotid sinus syncope
I20.0	Unstable angina
I20.1	Angina pectoris with documented spasm
I20.81	Angina pectoris with coronary microvascular dysfunction
I20.89	Other forms of angina pectoris
I21.01	ST elevation (STEMI) myocardial infarction involving left main coronary artery
I21.02	ST elevation (STEMI) myocardial infarction involving left anterior descending coronary artery
I21.09	ST elevation (STEMI) myocardial infarction involving other coronary artery of anterior wall
I21.11	ST elevation (STEMI) myocardial infarction involving right coronary artery
I21.19	ST elevation (STEMI) myocardial infarction involving other coronary artery of inferior wall
I21.21	ST elevation (STEMI) myocardial infarction involving left circumflex coronary artery
I21.29	ST elevation (STEMI) myocardial infarction involving other sites
I21.4	Non-ST elevation (NSTEMI) myocardial infarction
I21.9	Acute myocardial infarction, unspecified
I21.A1	Myocardial infarction type 2
I21.A9	Other myocardial infarction type
I21.B	Myocardial infarction with coronary microvascular dysfunction
I22.0	Subsequent ST elevation (STEMI) myocardial infarction of anterior wall
I22.1	Subsequent ST elevation (STEMI) myocardial infarction of inferior wall
I22.2	Subsequent non-ST elevation (NSTEMI) myocardial infarction
I22.8	Subsequent ST elevation (STEMI) myocardial infarction of other sites
I23.7	Postinfarction angina
I24.0	Acute coronary thrombosis not resulting in myocardial infarction
I24.1	Dressler's syndrome
I24.81	Acute coronary microvascular dysfunction
I24.89	Other forms of acute ischemic heart disease
I25.10	Atherosclerotic heart disease of native coronary artery without angina pectoris
I25.110	Atherosclerotic heart disease of native coronary artery with unstable angina pectoris
I25.111	Atherosclerotic heart disease of native coronary artery with angina pectoris with documented spasm
I25.112	Atherosclerotic heart disease of native coronary artery with refractory angina pectoris
I25.118	Atherosclerotic heart disease of native coronary artery with other forms of angina pectoris

Diagnosis Code	Description
For CPT Codes 93228, 93229, 93268, 93270, 93271, and 93272	
I25.2	Old myocardial infarction
I25.3	Aneurysm of heart
I25.41	Coronary artery aneurysm
I25.5	Ischemic cardiomyopathy
I25.6	Silent myocardial ischemia
I25.700	Atherosclerosis of coronary artery bypass graft(s), unspecified, with unstable angina pectoris
I25.701	Atherosclerosis of coronary artery bypass graft(s), unspecified, with angina pectoris with documented spasm
I25.702	Atherosclerosis of coronary artery bypass graft(s), unspecified, with refractory angina pectoris
I25.708	Atherosclerosis of coronary artery bypass graft(s), unspecified, with other forms of angina pectoris
I25.710	Atherosclerosis of autologous vein coronary artery bypass graft(s) with unstable angina pectoris
I25.711	Atherosclerosis of autologous vein coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.712	Atherosclerosis of autologous vein coronary artery bypass graft(s) with refractory angina pectoris
I25.718	Atherosclerosis of autologous vein coronary artery bypass graft(s) with other forms of angina pectoris
I25.720	Atherosclerosis of autologous artery coronary artery bypass graft(s) with unstable angina pectoris
I25.721	Atherosclerosis of autologous artery coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.722	Atherosclerosis of autologous artery coronary artery bypass graft(s) with refractory angina pectoris
I25.728	Atherosclerosis of autologous artery coronary artery bypass graft(s) with other forms of angina pectoris
I25.730	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with unstable angina pectoris
I25.731	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.732	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with refractory angina pectoris
I25.738	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with other forms of angina pectoris
I25.750	Atherosclerosis of native coronary artery of transplanted heart with unstable angina
I25.751	Atherosclerosis of native coronary artery of transplanted heart with angina pectoris with documented spasm
I25.752	Atherosclerosis of native coronary artery of transplanted heart with refractory angina pectoris
I25.758	Atherosclerosis of native coronary artery of transplanted heart with other forms of angina pectoris
I25.760	Atherosclerosis of bypass graft of coronary artery of transplanted heart with unstable angina
I25.761	Atherosclerosis of bypass graft of coronary artery of transplanted heart with angina pectoris with documented spasm
I25.762	Atherosclerosis of bypass graft of coronary artery of transplanted heart with refractory angina pectoris
I25.768	Atherosclerosis of bypass graft of coronary artery of transplanted heart with other forms of angina pectoris
I25.790	Atherosclerosis of other coronary artery bypass graft(s) with unstable angina pectoris
I25.791	Atherosclerosis of other coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.792	Atherosclerosis of other coronary artery bypass graft(s) with refractory angina pectoris
I25.798	Atherosclerosis of other coronary artery bypass graft(s) with other forms of angina pectoris

Diagnosis Code	Description
For CPT Codes 93228, 93229, 93268, 93270, 93271, and 93272	
I25.810	Atherosclerosis of coronary artery bypass graft(s) without angina pectoris
I25.811	Atherosclerosis of native coronary artery of transplanted heart without angina pectoris
I25.812	Atherosclerosis of bypass graft of coronary artery of transplanted heart without angina pectoris
I25.82	Chronic total occlusion of coronary artery
I25.83	Coronary atherosclerosis due to lipid rich plaque
I25.84	Coronary atherosclerosis due to calcified coronary lesion
I25.85	Chronic coronary microvascular dysfunction
I25.89	Other forms of chronic ischemic heart disease
I42.0	Dilated cardiomyopathy
I42.1	Obstructive hypertrophic cardiomyopathy
I42.2	Other hypertrophic cardiomyopathy
I42.3	Endomyocardial (eosinophilic) disease
I42.4	Endocardial fibroelastosis
I42.5	Other restrictive cardiomyopathy
I42.6	Alcoholic cardiomyopathy
I42.7	Cardiomyopathy due to drug and external agent
I42.8	Other cardiomyopathies
I43	Cardiomyopathy in diseases classified elsewhere
I44.0	Atrioventricular block, first degree
I44.1	Atrioventricular block, second degree
I44.2	Atrioventricular block, complete
I44.30	Unspecified atrioventricular block
I44.39	Other atrioventricular block
I44.4	Left anterior fascicular block
I44.5	Left posterior fascicular block
I44.69	Other fascicular block
I44.7	Left bundle-branch block, unspecified
I45.0	Right fascicular block
I45.19	Other right bundle-branch block
I45.2	Bifascicular block
I45.3	Trifascicular block
I45.4	Nonspecific intraventricular block
I45.5	Other specified heart block
I45.6	Pre-excitation syndrome
I45.81	Long QT syndrome
I45.89	Other specified conduction disorders
I46.2	Cardiac arrest due to underlying cardiac condition
I46.8	Cardiac arrest due to other underlying condition
I46.9	Cardiac arrest, cause unspecified
I47.0	Re-entry ventricular arrhythmia
I47.10	Supraventricular tachycardia, unspecified
I47.11	Inappropriate sinus tachycardia, so stated
I47.19	Other supraventricular tachycardia
I47.20	Ventricular tachycardia, unspecified

Diagnosis Code	Description
For CPT Codes 93228, 93229, 93268, 93270, 93271, and 93272	
I47.21	Torsades de pointes
I47.29	Other ventricular tachycardia
I47.9	Paroxysmal tachycardia, unspecified
I48.0	Paroxysmal atrial fibrillation
I48.11	Longstanding persistent atrial fibrillation
I48.19	Other persistent atrial fibrillation
I48.20	Chronic atrial fibrillation, unspecified
I48.21	Permanent atrial fibrillation
I48.3	Typical atrial flutter
I48.4	Atypical atrial flutter
I48.91	Unspecified atrial fibrillation
I48.92	Unspecified atrial flutter
I49.01	Ventricular fibrillation
I49.02	Ventricular flutter
I49.1	Atrial premature depolarization
I49.2	Junctional premature depolarization
I49.3	Ventricular premature depolarization
I49.40	Unspecified premature depolarization
I49.49	Other premature depolarization
I49.5	Sick sinus syndrome
I49.8	Other specified cardiac arrhythmias
I5A	Non-ischemic myocardial injury (non-traumatic)
I63.10	Cerebral infarction due to embolism of unspecified precerebral artery
I63.111	Cerebral infarction due to embolism of right vertebral artery
I63.112	Cerebral infarction due to embolism of left vertebral artery
I63.113	Cerebral infarction due to embolism of bilateral vertebral arteries
I63.119	Cerebral infarction due to embolism of unspecified vertebral artery
I63.12	Cerebral infarction due to embolism of basilar artery
I63.131	Cerebral infarction due to embolism of right carotid artery
I63.132	Cerebral infarction due to embolism of left carotid artery
I63.133	Cerebral infarction due to embolism of bilateral carotid arteries
I63.139	Cerebral infarction due to embolism of unspecified carotid artery
I63.19	Cerebral infarction due to embolism of other precerebral artery
I63.40	Cerebral infarction due to embolism of unspecified cerebral artery
I63.411	Cerebral infarction due to embolism of right middle cerebral artery
I63.412	Cerebral infarction due to embolism of left middle cerebral artery
I63.413	Cerebral infarction due to embolism of bilateral middle cerebral arteries
I63.419	Cerebral infarction due to embolism of unspecified middle cerebral artery
I63.421	Cerebral infarction due to embolism of right anterior cerebral artery
I63.422	Cerebral infarction due to embolism of left anterior cerebral artery
I63.423	Cerebral infarction due to embolism of bilateral anterior cerebral arteries
I63.429	Cerebral infarction due to embolism of unspecified anterior cerebral artery
I63.431	Cerebral infarction due to embolism of right posterior cerebral artery
I63.432	Cerebral infarction due to embolism of left posterior cerebral artery

Diagnosis Code	Description
For CPT Codes 93228, 93229, 93268, 93270, 93271, and 93272	
I63.433	Cerebral infarction due to embolism of bilateral posterior cerebral arteries
I63.439	Cerebral infarction due to embolism of unspecified posterior cerebral artery
I63.441	Cerebral infarction due to embolism of right cerebellar artery
I63.442	Cerebral infarction due to embolism of left cerebellar artery
I63.443	Cerebral infarction due to embolism of bilateral cerebellar arteries
I63.449	Cerebral infarction due to embolism of unspecified cerebellar artery
I63.49	Cerebral infarction due to embolism of other cerebral artery
I63.89	Other cerebral infarction
I63.9	Cerebral infarction, unspecified
I67.841	Reversible cerebrovascular vasoconstriction syndrome
I67.848	Other cerebrovascular vasospasm and vasoconstriction
I67.850	Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy
I67.858	Other hereditary cerebrovascular disease
I97.120	Postprocedural cardiac arrest following cardiac surgery
I97.121	Postprocedural cardiac arrest following other surgery
I97.190	Other postprocedural cardiac functional disturbances following cardiac surgery
I97.191	Other postprocedural cardiac functional disturbances following other surgery
Q20.3	Discordant ventriculoarterial connection
Q20.5	Discordant atrioventricular connection
Q20.8	Other congenital malformations of cardiac chambers and connections
Q20.9	Congenital malformation of cardiac chambers and connections, unspecified
Q21.11	Secundum atrial septal defect
Q21.12	Patent foramen ovale
Q21.13	Coronary sinus atrial septal defect
Q21.21	Partial atrioventricular septal defect
Q21.22	Transitional atrioventricular septal defect
Q21.23	Complete atrioventricular septal defect
Q21.3	Tetralogy of Fallot
Q24.6	Congenital heart block
R00.0	Tachycardia, unspecified
R00.1	Bradycardia, unspecified
R00.2	Palpitations
R00.8	Other abnormalities of heart beat
R06.00	Dyspnea, unspecified
R06.01	Orthopnea
R06.02	Shortness of breath
R06.03	Acute respiratory distress
R06.09	Other forms of dyspnea
R06.1	Stridor
R06.2	Wheezing
R06.3	Periodic breathing
R06.4	Hyperventilation
R06.81	Apnea, not elsewhere classified
R06.82	Tachypnea, not elsewhere classified

Diagnosis Code	Description
For CPT Codes 93228, 93229, 93268, 93270, 93271, and 93272	
R06.83	Snoring
R06.89	Other abnormalities of breathing
R07.1	Chest pain on breathing
R07.2	Precordial pain
R07.82	Intercostal pain
R07.89	Other chest pain
R07.9	Chest pain, unspecified
R10.13	Epigastric pain
R29.5	Transient paralysis
R40.4	Transient alteration of awareness
R42	Dizziness and giddiness
R55	Syncope and collapse
T46.0x5A	Adverse effect of cardiac-stimulant glycosides and drugs of similar action, initial encounter
T46.0x5S	Adverse effect of cardiac-stimulant glycosides and drugs of similar action, sequela
T46.1x5A	Adverse effect of calcium-channel blockers, initial encounter
T46.1x5S	Adverse effect of calcium-channel blockers, sequela
T46.2x5A	Adverse effect of other antidysrhythmic drugs, initial encounter
T46.2x5S	Adverse effect of other antidysrhythmic drugs, sequela
T46.905A	Adverse effect of unspecified agents primarily affecting the cardiovascular system, initial encounter
T46.905S	Adverse effect of unspecified agents primarily affecting the cardiovascular system, sequela
T46.995A	Adverse effect of other agents primarily affecting the cardiovascular system, initial encounter
T46.995S	Adverse effect of other agents primarily affecting the cardiovascular system, sequela
Z79.85	Long-term (current) use of injectable non-insulin antidiabetic drugs
Z79.891	Long term (current) use of opiate analgesic
Z79.899	Other long term (current) drug therapy
Z86.73	Personal history of transient ischemic attack (TIA), and cerebral infarction without residual deficits
Z86.74	Personal history of sudden cardiac arrest
For CPT Codes 93241, 93242, 93243, 93244, 93245, 93246, 93247, and 93248	
G45.0	Vertebro-basilar artery syndrome
G45.1	Carotid artery syndrome (hemispheric)
G45.2	Multiple and bilateral precerebral artery syndromes
G45.3	Amaurosis fugax
G45.4	Transient global amnesia
G45.8	Other transient cerebral ischemic attacks and related syndromes
G45.9	Transient cerebral ischemic attack, unspecified
G90.01	Carotid sinus syncope
I20.0	Unstable angina
I20.1	Angina pectoris with documented spasm
I20.81	Angina pectoris with coronary microvascular dysfunction
I20.89	Other forms of angina pectoris
I21.01	ST elevation (STEMI) myocardial infarction involving left main coronary artery
I21.02	ST elevation (STEMI) myocardial infarction involving left anterior descending coronary artery
I21.09	ST elevation (STEMI) myocardial infarction involving other coronary artery of anterior wall
I21.11	ST elevation (STEMI) myocardial infarction involving right coronary artery

Diagnosis Code	Description
For CPT Codes 93241, 93242, 93243, 93244, 93245, 93246, 93247, and 93248	
I21.19	ST elevation (STEMI) myocardial infarction involving other coronary artery of inferior wall
I21.21	ST elevation (STEMI) myocardial infarction involving left circumflex coronary artery
I21.29	ST elevation (STEMI) myocardial infarction involving other sites
I21.4	Non-ST elevation (NSTEMI) myocardial infarction
I21.9	Acute myocardial infarction, unspecified
I21.A1	Myocardial infarction type 2
I21.A9	Other myocardial infarction type
I21.B	Myocardial infarction with coronary microvascular dysfunction
I22.0	Subsequent ST elevation (STEMI) myocardial infarction of anterior wall
I22.1	Subsequent ST elevation (STEMI) myocardial infarction of inferior wall
I22.2	Subsequent non-ST elevation (NSTEMI) myocardial infarction
I22.8	Subsequent ST elevation (STEMI) myocardial infarction of other sites
I23.7	Postinfarction angina
I24.0	Acute coronary thrombosis not resulting in myocardial infarction
I24.1	Dressler's syndrome
I24.81	Acute coronary microvascular dysfunction
I24.89	Other forms of acute ischemic heart disease
I25.10	Atherosclerotic heart disease of native coronary artery without angina pectoris
I25.110	Atherosclerotic heart disease of native coronary artery with unstable angina pectoris
I25.111	Atherosclerotic heart disease of native coronary artery with angina pectoris with documented spasm
I25.112	Atherosclerotic heart disease of native coronary artery with refractory angina pectoris
I25.118	Atherosclerotic heart disease of native coronary artery with other forms of angina pectoris
I25.2	Old myocardial infarction
I25.3	Aneurysm of heart
I25.41	Coronary artery aneurysm
I25.5	Ischemic cardiomyopathy
I25.6	Silent myocardial ischemia
I25.700	Atherosclerosis of coronary artery bypass graft(s), unspecified, with unstable angina pectoris
I25.701	Atherosclerosis of coronary artery bypass graft(s), unspecified, with angina pectoris with documented spasm
I25.702	Atherosclerosis of coronary artery bypass graft(s), unspecified, with refractory angina pectoris
I25.708	Atherosclerosis of coronary artery bypass graft(s), unspecified, with other forms of angina pectoris
I25.710	Atherosclerosis of autologous vein coronary artery bypass graft(s) with unstable angina pectoris
I25.711	Atherosclerosis of autologous vein coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.712	Atherosclerosis of autologous vein coronary artery bypass graft(s) with refractory angina pectoris
I25.718	Atherosclerosis of autologous vein coronary artery bypass graft(s) with other forms of angina pectoris
I25.720	Atherosclerosis of autologous artery coronary artery bypass graft(s) with unstable angina pectoris
I25.721	Atherosclerosis of autologous artery coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.722	Atherosclerosis of autologous artery coronary artery bypass graft(s) with refractory angina pectoris
I25.728	Atherosclerosis of autologous artery coronary artery bypass graft(s) with other forms of angina pectoris
I25.730	Atherosclerosis of non-autologous biological coronary artery bypass graft(s) with unstable angina pectoris

Diagnosis Code	Description
For CPT Codes 93241, 93242, 93243, 93244, 93245, 93246, 93247, and 93248	
I25.731	Atherosclerosis of non-autologous biological coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.732	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with refractory angina pectoris
I25.738	Atherosclerosis of non-autologous biological coronary artery bypass graft(s) with other forms of angina pectoris
I25.750	Atherosclerosis of native coronary artery of transplanted heart with unstable angina
I25.751	Atherosclerosis of native coronary artery of transplanted heart with angina pectoris with documented spasm
I25.752	Atherosclerosis of native coronary artery of transplanted heart with refractory angina pectoris
I25.758	Atherosclerosis of native coronary artery of transplanted heart with other forms of angina pectoris
I25.760	Atherosclerosis of bypass graft of coronary artery of transplanted heart with unstable angina
I25.761	Atherosclerosis of bypass graft of coronary artery of transplanted heart with angina pectoris with documented spasm
I25.762	Atherosclerosis of bypass graft of coronary artery of transplanted heart with refractory angina pectoris
I25.768	Atherosclerosis of bypass graft of coronary artery of transplanted heart with other forms of angina pectoris
I25.790	Atherosclerosis of other coronary artery bypass graft(s) with unstable angina pectoris
I25.791	Atherosclerosis of other coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.792	Atherosclerosis of other coronary artery bypass graft(s) with refractory angina pectoris
I25.798	Atherosclerosis of other coronary artery bypass graft(s) with other forms of angina pectoris
I25.810	Atherosclerosis of coronary artery bypass graft(s) without angina pectoris
I25.811	Atherosclerosis of native coronary artery of transplanted heart without angina pectoris
I25.812	Atherosclerosis of bypass graft of coronary artery of transplanted heart without angina pectoris
I25.82	Chronic total occlusion of coronary artery
I25.83	Coronary atherosclerosis due to lipid rich plaque
I25.84	Coronary atherosclerosis due to calcified coronary lesion
I25.85	Chronic coronary microvascular dysfunction
I25.89	Other forms of chronic ischemic heart disease
I42.0	Dilated cardiomyopathy
I42.1	Obstructive hypertrophic cardiomyopathy
I42.2	Other hypertrophic cardiomyopathy
I42.3	Endomyocardial (eosinophilic) disease
I42.4	Endocardial fibroelastosis
I42.5	Other restrictive cardiomyopathy
I42.6	Alcoholic cardiomyopathy
I42.7	Cardiomyopathy due to drug and external agent
I42.8	Other cardiomyopathies
I43	Cardiomyopathy in diseases classified elsewhere
I44.0	Atrioventricular block, first degree
I44.1	Atrioventricular block, second degree
I44.2	Atrioventricular block, complete
I44.30	Unspecified atrioventricular block
I44.39	Other atrioventricular block

Diagnosis Code	Description
For CPT Codes 93241, 93242, 93243, 93244, 93245, 93246, 93247, and 93248	
I44.4	Left anterior fascicular block
I44.5	Left posterior fascicular block
I44.69	Other fascicular block
I44.7	Left bundle-branch block, unspecified
I45.0	Right fascicular block
I45.19	Other right bundle-branch block
I45.2	Bifascicular block
I45.3	Trifascicular block
I45.4	Nonspecific intraventricular block
I45.5	Other specified heart block
I45.6	Pre-excitation syndrome
I45.81	Long QT syndrome
I45.89	Other specified conduction disorders
I46.2	Cardiac arrest due to underlying cardiac condition
I46.8	Cardiac arrest due to other underlying condition
I46.9	Cardiac arrest, cause unspecified
I47.0	Re-entry ventricular arrhythmia
I47.10	Supraventricular tachycardia, unspecified
I47.11	Inappropriate sinus tachycardia, so stated
I47.19	Other supraventricular tachycardia
I47.20	Ventricular tachycardia, unspecified
I47.21	Torsades de pointes
I47.29	Other ventricular tachycardia
I47.9	Paroxysmal tachycardia, unspecified
I48.0	Paroxysmal atrial fibrillation
I48.11	Longstanding persistent atrial fibrillation
I48.19	Other persistent atrial fibrillation
I48.20	Chronic atrial fibrillation, unspecified
I48.21	Permanent atrial fibrillation
I48.3	Typical atrial flutter
I48.4	Atypical atrial flutter
I48.91	Unspecified atrial fibrillation
I48.92	Unspecified atrial flutter
I49.01	Ventricular fibrillation
I49.02	Ventricular flutter
I49.1	Atrial premature depolarization
I49.2	Junctional premature depolarization
I49.3	Ventricular premature depolarization
I49.40	Unspecified premature depolarization
I49.49	Other premature depolarization
I49.5	Sick sinus syndrome
I49.8	Other specified cardiac arrhythmias
I5A	Non-ischemic myocardial injury (non-traumatic)

Diagnosis Code	Description
For CPT Codes 93241, 93242, 93243, 93244, 93245, 93246, 93247, and 93248	
I63.10	Cerebral infarction due to embolism of unspecified precerebral artery
I63.111	Cerebral infarction due to embolism of right vertebral artery
I63.112	Cerebral infarction due to embolism of left vertebral artery
I63.113	Cerebral infarction due to embolism of bilateral vertebral arteries
I63.119	Cerebral infarction due to embolism of unspecified vertebral artery
I63.12	Cerebral infarction due to embolism of basilar artery
I63.131	Cerebral infarction due to embolism of right carotid artery
I63.132	Cerebral infarction due to embolism of left carotid artery
I63.133	Cerebral infarction due to embolism of bilateral carotid arteries
I63.139	Cerebral infarction due to embolism of unspecified carotid artery
I63.19	Cerebral infarction due to embolism of other precerebral artery
I63.40	Cerebral infarction due to embolism of unspecified cerebral artery
I63.411	Cerebral infarction due to embolism of right middle cerebral artery
I63.412	Cerebral infarction due to embolism of left middle cerebral artery
I63.413	Cerebral infarction due to embolism of bilateral middle cerebral arteries
I63.419	Cerebral infarction due to embolism of unspecified middle cerebral artery
I63.421	Cerebral infarction due to embolism of right anterior cerebral artery
I63.422	Cerebral infarction due to embolism of left anterior cerebral artery
I63.423	Cerebral infarction due to embolism of bilateral anterior cerebral arteries
I63.429	Cerebral infarction due to embolism of unspecified anterior cerebral artery
I63.431	Cerebral infarction due to embolism of right posterior cerebral artery
I63.432	Cerebral infarction due to embolism of left posterior cerebral artery
I63.433	Cerebral infarction due to embolism of bilateral posterior cerebral arteries
I63.439	Cerebral infarction due to embolism of unspecified posterior cerebral artery
I63.441	Cerebral infarction due to embolism of right cerebellar artery
I63.442	Cerebral infarction due to embolism of left cerebellar artery
I63.443	Cerebral infarction due to embolism of bilateral cerebellar arteries
I63.449	Cerebral infarction due to embolism of unspecified cerebellar artery
I63.49	Cerebral infarction due to embolism of other cerebral artery
I63.89	Other cerebral infarction
I63.9	Cerebral infarction, unspecified
I67.841	Reversible cerebrovascular vasoconstriction syndrome
I67.848	Other cerebrovascular vasospasm and vasoconstriction
I97.120	Postprocedural cardiac arrest following cardiac surgery
I97.121	Postprocedural cardiac arrest following other surgery
I97.190	Other postprocedural cardiac functional disturbances following cardiac surgery
I97.191	Other postprocedural cardiac functional disturbances following other surgery
Q20.3	Discordant ventriculoarterial connection
Q20.5	Discordant atrioventricular connection
Q20.8	Other congenital malformations of cardiac chambers and connections
Q20.9	Congenital malformation of cardiac chambers and connections, unspecified
Q21.11	Secundum atrial septal defect
Q21.12	Patent foramen ovale
Q21.13	Coronary sinus atrial septal defect

Diagnosis Code	Description
For CPT Codes 93241, 93242, 93243, 93244, 93245, 93246, 93247, and 93248	
Q21.21	Partial atrioventricular septal defect
Q21.22	Transitional atrioventricular septal defect
Q21.23	Complete atrioventricular septal defect
Q21.3	Tetralogy of Fallot
Q24.6	Congenital heart block
R00.0	Tachycardia, unspecified
R00.1	Bradycardia, unspecified
R00.2	Palpitations
R00.8	Other abnormalities of heart beat
R06.00	Dyspnea, unspecified
R06.01	Orthopnea
R06.02	Shortness of breath
R06.03	Acute respiratory distress
R06.09	Other forms of dyspnea
R06.2	Wheezing
R06.3	Periodic breathing
R06.4	Hyperventilation
R06.81	Apnea, not elsewhere classified
R06.82	Tachypnea, not elsewhere classified
R06.83	Snoring
R06.89	Other abnormalities of breathing
R07.1	Chest pain on breathing
R07.2	Precordial pain
R07.82	Intercostal pain
R07.89	Other chest pain
R07.9	Chest pain, unspecified
R10.13	Epigastric pain
R29.5	Transient paralysis
R40.4	Transient alteration of awareness
R42	Dizziness and giddiness
R55	Syncope and collapse
T46.0X5A	Adverse effect of cardiac-stimulant glycosides and drugs of similar action, initial encounter
T46.0X5S	Adverse effect of cardiac-stimulant glycosides and drugs of similar action, sequela
T46.1X5A	Adverse effect of calcium-channel blockers, initial encounter
T46.1X5S	Adverse effect of calcium-channel blockers, sequela
T46.2X5A	Adverse effect of other antidysrhythmic drugs, initial encounter
T46.2X5S	Adverse effect of other antidysrhythmic drugs, sequela
T46.905A	Adverse effect of unspecified agents primarily affecting the cardiovascular system, initial encounter
T46.905S	Adverse effect of unspecified agents primarily affecting the cardiovascular system, sequela
T46.995A	Adverse effect of other agents primarily affecting the cardiovascular system, initial encounter
T46.995S	Adverse effect of other agents primarily affecting the cardiovascular system, sequela
Z79.85	Long-term (current) use of injectable non-insulin antidiabetic drugs
Z79.891	Long term (current) use of opiate analgesic
Z79.899	Other long term (current) drug therapy

Diagnosis Code	Description
For CPT Codes 93241, 93242, 93243, 93244, 93245, 93246, 93247, and 93248	
Z86.73	Personal history of transient ischemic attack (TIA), and cerebral infarction without residual deficits
Z86.74	Personal history of sudden cardiac arrest
For CPT Codes 0937T, 0938T, 0939T, and 0940T	
G45.3	Amaurosis fugax
G45.8	Other transient cerebral ischemic attacks and related syndromes
G45.9	Transient cerebral ischemic attack, unspecified
G90.01	Carotid sinus syncope
I20.0	Unstable angina
I20.1	Angina pectoris with documented spasm
I20.81	Angina pectoris with coronary microvascular dysfunction
I20.89	Other forms of angina pectoris
I21.01	ST elevation (STEMI) myocardial infarction involving left main coronary artery
I21.02	ST elevation (STEMI) myocardial infarction involving left anterior descending coronary artery
I21.09	ST elevation (STEMI) myocardial infarction involving other coronary artery of anterior wall
I21.11	ST elevation (STEMI) myocardial infarction involving right coronary artery
I21.19	ST elevation (STEMI) myocardial infarction involving other coronary artery of inferior wall
I21.21	ST elevation (STEMI) myocardial infarction involving left circumflex coronary artery
I21.29	ST elevation (STEMI) myocardial infarction involving other sites
I21.4	Non-ST elevation (NSTEMI) myocardial infarction
I21.A1	Myocardial infarction type 2
I21.A9	Other myocardial infarction type
I21.B	Myocardial infarction with coronary microvascular dysfunction
I22.0	Subsequent ST elevation (STEMI) myocardial infarction of anterior wall
I22.1	Subsequent ST elevation (STEMI) myocardial infarction of inferior wall
I22.2	Subsequent non-ST elevation (NSTEMI) myocardial infarction
I22.8	Subsequent ST elevation (STEMI) myocardial infarction of other sites
I23.7	Postinfarction angina
I24.81	Acute coronary microvascular dysfunction
I24.89	Other forms of acute ischemic heart disease
I25.10	Atherosclerotic heart disease of native coronary artery without angina pectoris
I25.110	Atherosclerotic heart disease of native coronary artery with unstable angina pectoris
I25.111	Atherosclerotic heart disease of native coronary artery with angina pectoris with documented spasm
I25.112	Atherosclerotic heart disease of native coronary artery with refractory angina pectoris
I25.118	Atherosclerotic heart disease of native coronary artery with other forms of angina pectoris
I25.2	Old myocardial infarction
I25.3	Aneurysm of heart
I25.41	Coronary artery aneurysm
I25.5	Ischemic cardiomyopathy
I25.6	Silent myocardial ischemia
I25.710	Atherosclerosis of autologous vein coronary artery bypass graft(s) with unstable angina pectoris
I25.711	Atherosclerosis of autologous vein coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.712	Atherosclerosis of autologous vein coronary artery bypass graft(s) with refractory angina pectoris
I25.718	Atherosclerosis of autologous vein coronary artery bypass graft(s) with other forms of angina pectoris

Diagnosis Code	Description
For CPT Codes 0937T, 0938T, 0939T, and 0940T	
I25.720	Atherosclerosis of autologous artery coronary artery bypass graft(s) with unstable angina pectoris
I25.721	Atherosclerosis of autologous artery coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.722	Atherosclerosis of autologous artery coronary artery bypass graft(s) with refractory angina pectoris
I25.728	Atherosclerosis of autologous artery coronary artery bypass graft(s) with other forms of angina pectoris
I25.730	Atherosclerosis of non-autologous biological coronary artery bypass graft(s) with unstable angina pectoris
I25.731	Atherosclerosis of non-autologous biological coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.732	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with refractory angina pectoris
I25.738	Atherosclerosis of non-autologous biological coronary artery bypass graft(s) with other forms of angina pectoris
I25.750	Atherosclerosis of native coronary artery of transplanted heart with unstable angina
I25.751	Atherosclerosis of native coronary artery of transplanted heart with angina pectoris with documented spasm
I25.752	Atherosclerosis of native coronary artery of transplanted heart with refractory angina pectoris
I25.758	Atherosclerosis of native coronary artery of transplanted heart with other forms of angina pectoris
I25.760	Atherosclerosis of bypass graft of coronary artery of transplanted heart with unstable angina
I25.761	Atherosclerosis of bypass graft of coronary artery of transplanted heart with angina pectoris with documented spasm
I25.762	Atherosclerosis of bypass graft of coronary artery of transplanted heart with refractory angina pectoris
I25.768	Atherosclerosis of bypass graft of coronary artery of transplanted heart with other forms of angina pectoris
I25.790	Atherosclerosis of other coronary artery bypass graft(s) with unstable angina pectoris
I25.791	Atherosclerosis of other coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.792	Atherosclerosis of other coronary artery bypass graft(s) with refractory angina pectoris
I25.798	Atherosclerosis of other coronary artery bypass graft(s) with other forms of angina pectoris
I25.810	Atherosclerosis of coronary artery bypass graft(s) without angina pectoris
I25.811	Atherosclerosis of native coronary artery of transplanted heart without angina pectoris
I25.812	Atherosclerosis of bypass graft of coronary artery of transplanted heart without angina pectoris
I25.82	Chronic total occlusion of coronary artery
I25.83	Coronary atherosclerosis due to lipid rich plaque
I25.84	Coronary atherosclerosis due to calcified coronary lesion
I25.85	Chronic coronary microvascular dysfunction
I25.89	Other forms of chronic ischemic heart disease
I42.0	Dilated cardiomyopathy
I42.1	Obstructive hypertrophic cardiomyopathy
I42.2	Other hypertrophic cardiomyopathy
I42.3	Endomyocardial (eosinophilic) disease
I42.4	Endocardial fibroelastosis
I42.5	Other restrictive cardiomyopathy
I42.6	Alcoholic cardiomyopathy
I42.7	Cardiomyopathy due to drug and external agent

Diagnosis Code	Description
For CPT Codes 0937T, 0938T, 0939T, and 0940T	
I42.8	Other cardiomyopathies
I43	Cardiomyopathy in diseases classified elsewhere
I44.0	Atrioventricular block, first degree
I44.1	Atrioventricular block, second degree
I44.2	Atrioventricular block, complete
I44.39	Other atrioventricular block
I44.4	Left anterior fascicular block
I44.5	Left posterior fascicular block
I44.69	Other fascicular block
I45.0	Right fascicular block
I45.19	Other right bundle-branch block
I45.2	Bifascicular block
I45.3	Trifascicular block
I45.5	Other specified heart block
I45.6	Pre-excitation syndrome
I45.81	Long QT syndrome
I45.89	Other specified conduction disorders
I46.2	Cardiac arrest due to underlying cardiac condition
I46.8	Cardiac arrest due to other underlying condition
I47.0	Re-entry ventricular arrhythmia
I47.11	Inappropriate sinus tachycardia, so stated
I47.19	Other supraventricular tachycardia
I47.21	Torsades de pointes
I47.29	Other ventricular tachycardia
I48.0	Paroxysmal atrial fibrillation
I48.11	Longstanding persistent atrial fibrillation
I48.19	Other persistent atrial fibrillation
I48.20	Chronic atrial fibrillation, unspecified
I48.21	Permanent atrial fibrillation
I48.3	Typical atrial flutter
I48.4	Atypical atrial flutter
I48.91	Unspecified atrial fibrillation
I48.92	Unspecified atrial flutter
I49.01	Ventricular fibrillation
I49.02	Ventricular flutter
I49.1	Atrial premature depolarization
I49.2	Junctional premature depolarization
I49.3	Ventricular premature depolarization
I49.49	Other premature depolarization
I49.5	Sick sinus syndrome
I49.8	Other specified cardiac arrhythmias
I5A	Non-ischemic myocardial injury (non-traumatic)
I63.9	Cerebral infarction, unspecified
I97.120	Postprocedural cardiac arrest following cardiac surgery

Diagnosis Code	Description
For CPT Codes 0937T, 0938T, 0939T, and 0940T	
I97.121	Postprocedural cardiac arrest following other surgery
I97.190	Other postprocedural cardiac functional disturbances following cardiac surgery
I97.191	Other postprocedural cardiac functional disturbances following other surgery
Q20.3	Discordant ventriculoarterial connection
Q20.5	Discordant atrioventricular connection
Q20.8	Other congenital malformations of cardiac chambers and connections
Q20.9	Congenital malformation of cardiac chambers and connections, unspecified
Q21.11	Secundum atrial septal defect
Q21.12	Patent foramen ovale
Q21.13	Coronary sinus atrial septal defect
Q21.21	Partial atrioventricular septal defect
Q21.22	Transitional atrioventricular septal defect
Q21.23	Complete atrioventricular septal defect
Q21.3	Tetralogy of Fallot
Q24.6	Congenital heart block
R00.0	Tachycardia, unspecified
R00.1	Bradycardia, unspecified
R00.2	Palpitations
R00.8	Other abnormalities of heart beat
R06.00	Dyspnea, unspecified
R06.01	Orthopnea
R06.02	Shortness of breath
R06.09	Other forms of dyspnea
R07.1	Chest pain on breathing
R07.2	Precordial pain
R07.89	Other chest pain
R07.9	Chest pain, unspecified
R10.13	Epigastric pain
R40.4	Transient alteration of awareness
R42	Dizziness and giddiness
R55	Syncope and collapse
Z86.73	Personal history of transient ischemic attack (TIA), and cerebral infarction without residual deficits
Z86.74	Personal history of sudden cardiac arrest

Definitions

Acute Coronary Syndrome (ACS): Applies to patients with suspicion or confirmation of acute myocardial ischemia or infarction. It describes a large array of signs and symptoms that range from atypical chest discomfort, nonspecific electrocardiographic changes, normal cardiac biomarkers, non-ST-elevation myocardial infarction (NSTEMI), large ST-segment elevation myocardial infarction (STEMI), and cardiogenic shock (Scirica, 2010).

Silent Myocardial Ischemia: Objective documentation of myocardial ischemia in the absence of angina or anginal equivalents (Cohn, 2003).

24-Hour Monitoring Station: A facility in operation 24-hours per day, seven days a week, with a receiving station staffed with EKG technicians or other non-physician staff on a 24-hour per day basis. The technicians should have immediate 24-

hour access to a physician to review transmitted data that falls outside of set parameters. The technicians should know how to contact available facilities to assist in any cardiac emergencies.

Centers for Medicare and Medicaid Services (CMS) Related Documents

After checking the table below and searching the Medicare Coverage Database, if no NCD, LCD, or LCA is found, refer to the criteria as noted in the Coverage Rationale section above.

NCD	LCD	LCA	Contractor Type	Contractor Name
Ambulatory Electrocardiographic (AECG) Monitoring				
NCD for Electrocardiographic Services (20.15)	L33952 Cardiac Event Detection	A56452 Billing and Coding: Cardiac Event Detection	Part A and B MAC	CGS
	L39492 Ambulatory Electrocardiograph (AECG) Monitoring	A59270 Billing and Coding: Ambulatory Electrocardiograph (AECG) Monitoring	Part A and B MAC	First Coast
	L39490 Ambulatory Electrocardiograph (AECG) Monitoring	A59268 Billing and Coding: Ambulatory Electrocardiograph (AECG) Monitoring	Part A and B MAC	Novitas**
	L34573 Cardiac Event Detection	A56606 Billing and Coding: Cardiac Event Detection	Part A MAC	Palmetto**
	L34636 Electrocardiographic (EKG or ECG) Monitoring (Holter or Real-Time Monitoring)	A57476 Billing and Coding: Electrocardiographic (EKG or ECG) Monitoring (Holter or Real-Time Monitoring)	Part A and B MAC	WPS*

Medicare Administrative Contractor (MAC) With Corresponding States/Territories	
MAC Name (Abbreviation)	**States/Territories**
CGS Administrators, LLC (CGS)	KY, OH
First Coast Service Options, Inc. (First Coast)	FL, PR, VI
National Government Services, Inc. (NGS)	CT, IL, ME, MA, MN, NH, NY, RI, VT, WI
Noridian Healthcare Solutions, LLC (Noridian)	AS, AK, AZ, CA, GU, HI, ID, MT, NV, ND, Northern Mariana Islands, OR, SD, UT, WA, WY
Novitas Solutions, Inc. (Novitas)	AR, CO, DC, DE, LA, MD, MS, NJ, NM, OK, PA, TX, VA**
Palmetto GBA (Palmetto)	AL, GA, NC, SC, TN, VA**, WV
Wisconsin Physicians Service Insurance Corporation (WPS)*	IA, IN, KS, MI, MO, NE
Notes	
*Wisconsin Physicians Service Insurance Corporation: Contract Number 05901 applies only to WPS Legacy Mutual of Omaha MAC A Providers. **For the state of Virginia: Part B services for the city of Alexandria and the counties of Arlington and Fairfax are excluded for the Palmetto GBA jurisdiction and included within the Novitas Solutions, Inc. jurisdiction.	

CMS Benefit Policy Manual

Chapter 15; § 80 Coverage of diagnostic x-ray, diagnostic laboratory, and other diagnostic tests

Jiang et al. (2022) conducted a meta-analysis and systematic review to evaluate the current modalities used for extended electrocardiographic (ECG) monitoring in the detection of atrial fibrillation (AF) following a cryptogenic stroke. Forty-seven studies with a total of 6,448 patients with cryptogenic stroke were included in the review. The pooled AF rate for implantable loop recorders (ILRs) increased from 4.9% (3.0%–7.9%) at one month to 38.4% (20.4%–60.2%) at 36 months. Mobile cardiac outpatient telemetry (MCOT) had a significantly higher pooled AF detection rate of 12.8% (8.9%–17.9%) versus 4.9% (3.0%–7.9%) for ILR at one month ($p < 0.0001$). Predictors for AF detection include duration of monitoring ($p < 0.0001$) and age ($p < 0.0001$) for ILRs, but only age for MCOTs ($p < 0.020$). The authors concluded that in patients with cognitive and physical ability to use ECG monitoring daily for one month, MCOT may capture a significant proportion of AF and should be considered in place of ILRs. If MCOT fails to detect AF after one month of monitoring or if there are compliance issues, ILRs may be considered. The authors recommended further research for MCOT in the detection of AF for those with cryptogenic stroke. Limitations include significant unexplained heterogeneity, poor reporting of features of the study population, and risk underestimation of AF detection rates in MCOT studies.

In a multicenter, randomized controlled trial (SEARCH-AF), Ha et al. (2021) evaluated if continuous electrocardiographic (ECG) monitoring after cardiac surgery improves detection of postoperative atrial fibrillation (POAF) compared to usual care. A total of 336 post-cardiac surgery patients across 10 Canadian Centers were randomized as follows: 163 underwent continuous cardiac rhythm monitoring with a patch-based monitor for 30 days and 173 received usual care which consisted of no mandated monitoring. Cardiac surgeries included coronary artery bypass grafting (CABG) and/or valve repair or replacement. Participants consisted of 22% women, average age of 67 years with a mean CHA2DS2-VASc (congestive heart failure, hypertension, age ≥ 75 years, diabetes, prior stroke or transient ischemic attack, vascular disease, age 65-74 years, female sex) score of 4, no history of preoperative AF, and POAF lasting less than 24 hours during hospitalization among the clinical characteristics. The primary outcome was documentation of cumulative AF and/or atrial flutter lasting ≥ 6 minutes detected by continuous cardiac rhythm monitoring or by a 12-lead electrocardiogram within 30 days of randomization. Secondary outcomes included cumulative AF lasting ≥ 6 hours and ≥ 24 hours within 30 days of randomization, death, myocardial infarction, ischemic stroke, non–central nervous system thromboembolism, major bleeding, and oral anticoagulation prescription. Out of the initial 336 participants, 307 (91.4%) completed the trial. In the intent-to-treat analysis, the primary end point occurred in 32 patients (19.6%) in the intervention group vs. 3 patients (1.7%) in the usual care group (absolute difference, 17.9%; 95% CI, 11.5%-24.3%; $p < .001$). AF lasting 6 hours or longer was detected in 14 patients (8.6%) in the intervention group vs. zero patients in the usual care group (absolute difference, 8.6%; 95% CI, 4.3%-12.9%; $p < .001$).The authors concluded in post–cardiac surgical patients at high risk of stroke, no preoperative AF history, and AF lasting less than 24 hours during hospitalization, continuous monitoring revealed a significant increase in the rate of POAF after discharge that would otherwise not be detected by usual care. The authors recommend additional studies to examine whether these patients would benefit from oral anticoagulation therapy. The authors acknowledge several limitations of the study, including a short follow-up period, which may not capture longer-term AF episodes or clinical outcomes such as stroke or mortality. Preoperative cardiac monitoring was not performed to rule out the presence of AF prior to surgery. In addition, the study excluded patients with prolonged in-hospital AF (≥ 24 hours) and those with extended hospital stays limiting its generalizability to all cardiac surgery patients.

Noubiap et al. (2021) conducted a systematic review and meta-analysis to evaluate data on atrial fibrillation (AF) detection rates and predictors comparing different rhythm monitoring strategies in patients with embolic stroke of undetermined source (ESUS) or cryptogenic stroke (CS). PubMed/MEDLINE, Excerpta Medica Database (EMBASE), and Web of Science were searched to identify all cohort studies or randomized controlled trials (RCTs) reporting primary data on the rates and predictors of AF detection in patients with CS or ESUS, published by July 6, 2020 and random-effects meta-analysis method was used to pool estimates. Forty-seven studies with a total of 8,215 patients with CS or ESUS were included. Using implantable cardiac monitor (ICM), the pooled rate of AF was 12.2% at 3 months, 16.0% at 6 months, 18.7% at 12 months, 22.8% at 24 months, and 28.5% at 36 months. AF rates were significantly higher in patients with ESUS vs CS (22.0% vs 14.2%; $p < 0.001$) at 6 months, and in studies using Reveal LINQ vs Reveal XT ICM (19.1% vs 13.0%; $p = 0.001$) at 12 months. Using mobile cardiac outpatient telemetry (MCOT), the pooled rate of AF was 13.7% at 1 month. Predictors of AF detection with ICM included older age, P wave maximal duration, CHA2DS2-VASc score, prolonged PR interval, and left atrial enlargement. The authors concluded more than a quarter of patient with CS or ESUS are diagnosed with AF during follow-up and about one in seven patients had AF detected within a month of MCOT, suggesting that a non-invasive rhythm monitoring strategy should be considered before invasive monitoring.

Eysenck et al. (2020) conducted a randomized controlled trial (RCT) to compare three cardiac rhythm monitoring devices, ZIO XT monitor (ZM), NUUBO vest (NV), and Carnation Ambulatory Monitor (CAM), with the ‘gold standard’ Novacor ‘R’ Test 4 (RT) in patients with an implanted dual chamber rate adaptive permanent pacemaker (DDDRP PPM) and known atrial fibrillation (AF). Twenty-one participants wore each of the four external cardiac monitors (ECMs) for 14 days in

randomized order, with at least seven days between each of the ECM applications. RT AF burden was less accurate than the ZM, NV or CAM ($p < 0.05$). Probability of inaccurate AF diagnosis was higher for RT than ZM or CAM OR 12.31 and 5.85, respectively ($p = 0.025$ and $p = 0.042$). ZM wear time was longer than the RT: 307 h vs. 224 h; $p = 0.02$. Acceptability was greater for CAM than RT (1.86 ±2.63 compared with 0.57 ±1.17 for CAM; $p = 0.024$). The authors concluded the ZM, NV and CAM are all more accurate than the standard practice RT device in AF burden assessment and the RT was more likely to give inaccurate diagnoses than ZM or CAM. Additionally, performance of all ECMs improved with longer duration AF episodes. Limitations include small sample size and all participants in the study had DDDRP PPMs in situ which may limit generalizability of findings with other cardiac pathology.

Fredriksson et al. (2020) studied intermittent ambulatory electrocardiographic (AECG) recordings versus continuous event recording in detecting A-Fib for patients 75-76 years of age. Two-hundred and sixty-nine patients that were included in this analysis were from the STROKESTOP II study from Europe. This study was conducted over a two-week period with 55 days on average for the intermittent recorders and 13 days on average for the continuous recorders. The devices were R-test 4® and Novocaor® (for continuous recording) and a 30 second handheld device Zenicor II® (for intermittent recording). All devices had activation buttons for symptomatic arrhythmias, and patients were given a symptom diary as well. Within the study, A-Fib was defined by the European Society of Cardiology (ESC) as “absolute irregular rate-to-rate intervals, no discernable distinct p-waves, and duration of at least 30 seconds” and recordings were manually inspected and validated on computerized algorithms. After the review of data, it was determined that continuous event recordings identified three times more cases of A-Fib (6%; n = 15/269) than the intermittent AECG recordings (2%; n = 5/269) (p = .002). On average, continuous recordings identified a 1-8 interquartile range (IQR) on day four and a 4-14 IQR on day eight for intermittent monitoring (p =.135). These IQR’s were analyzed using the Mann-Whitney U test and Chi-square tests in relation to proportions. While comparisons between the two monitoring methods were performed, the use of the McNemar’s test resulted in $p < .05$, which was considered significant when testing for dichotomous variables and paired sample t-test for continuous variables. Surprisingly, only six percent of the patients reported symptoms within their diaries when having verified A-Fib and none of the patients had reported palpitations. Limitations of the study include: patients that were part of a larger study (STROKESTOP II) and were thus highly motivated and possibly healthier than peers, use of one-lead AECGs that potentially complicate the analysis of the p-waves, possible bias by misclassification case, and conflicts of interest for those study team members receiving grants from companies such as Bayer, Pfizer, Sanofi, AstraZeneca, and Medtronic.

In the early prolonged ambulatory cardiac monitoring in stroke (EPACS) open-label randomized controlled trial (RCT) conducted by Kaura et al. (2019), the authors compared a 14-day electrocardiogram (ECG) monitoring patch (Zio® Patch, iRhythm Technologies) to a short-duration Holter monitoring for the detection of paroxysmal atrial fibrillation (PAF) in patients with cryptogenic ischemic stroke or transient ischemic attack (TIA) early after the index event. The primary outcome was the detection of one or more episodes of ECG-documented PAF lasting at least 30 seconds within 90 days of the stroke or TIA in each of the study arms. The study included 116 patients from two sites in the UK who were randomly assigned in a 1:1 ratio with 56 patients in the patch-based monitoring group and 60 patients in the short-duration Holter monitoring group. All patients underwent short-term Holter monitoring for the duration determined by their treating physician (usually 24 hours) with a mean time of 2.1 + 1.2 days from time of the stroke or TIA event. The patients in the patch-based group then had the patch applied with a mean time of 38.9 + 33.6 days from the stroke or TIA event and wore the patch for 14 days. The patients were followed up on day 28 and day 90 via electronic medical record data search and a telephonic outreach to each patient. Data collected included PAF documented on the ECG monitoring devices or detected incidentally during usual clinical practice. The rate of detection of PAF reported by the authors at 28 days was 14% in the patch-based monitoring group and 2.1% in the Holter monitoring group. All patients who were newly diagnosed with PAF were started on anticoagulation therapy by day 90. There was no difference in the rate of recurrent ischemic stroke or TIA between the two groups. The authors concluded that early, prolonged patch-based monitoring after an index stroke or TIA is superior to short-duration Holter monitoring in the detection of PAF with an associated greater use of anticoagulation. Limitations noted by the authors included a 20% drop out rate due to Holter ECG service provision, the lack of comparison to other extended monitoring systems such as implantable loop recorders and the lack of a control group with healthy individuals who had not had an ischemic stroke or TIA.

Sposato et al. (2015) conducted a systematic review and meta-analysis of 50 studies (n = 11,658) to estimate the proportion of individuals with newly diagnosed atrial fibrillation (AF) following transient ischaemic attack (TIA) or stroke. The studies noted diagnostic methods including electrocardiogram (ECG), continuous inpatient ECG monitoring, Holter monitoring, continuous inpatient cardiac telemetry, outpatient mobile cardiac telemetry, external loop recording and implantable loop recorders. Phase one was assessment in the emergency room with ECG. Phase two (inpatient stay) comprised serial ECG, continuous ECG, inpatient cardiac telemetry and inpatient Holter monitoring. In phase three, the first ambulatory period, Holter monitoring was utilized. The fourth phase was the second ambulatory period, which consisted of mobile cardiac telemetry, external loop, and implantable loop recording. Phase four revealed AF in 16.9% of

patients; the overall AF detection after all four phases was 23.7%. The authors concluded that combined cardiac monitoring methods may lead to newly detected AF in nearly a quarter of patients with stroke or TIA.

Barrett et al. (2014) conducted a prospective analysis of cardiac arrhythmias using the Holter monitor and the Zio patch between April 2012 and July 2012. The goal was to compare arrhythmia detections over the course of 14 days to the arrhythmia events detected in the first 24 hours of monitoring. One hundred and forty-six patients between the ages of 22 and 94 participated in the study. The average wear time of the ambulatory electrocardiographic (AECG) monitors ranged between one day for the Holter monitor and eleven days for the patch monitor. Both devices were activated simultaneously and monitored for 24 hours for the Holter monitor and up to 14 days for the patch monitor. All arrhythmias were evaluated by the Scripps Translational Science Institute and the McNemar's test was implemented to compare if arrhythmias were clinically significant and what type of arrhythmias were detected by each monitor. Arrhythmia detection was placed into six categories: supraventricular tachycardia (SVT) (> 4 beats, not including A-Fib or A-Flutter), A-Fib/A-Flutter (> 4 beats), pause > 3 seconds, atrioventricular block [Mobitz type II or third-degree atrioventricular (AV) block], ventricular tachycardia (VT) (> 4 beats), or polymorphic ventricular tachycardia/ventricular fibrillation. The results demonstrated that the "patch monitor detected 96 arrhythmia events compared with 61 arrhythmia events by the Holter monitor ($p < .001$)." The patch monitor and Holter monitor detected the same number of events, but "14 clinically significant arrhythmia events were detected by the adhesive patch monitor that went undetected by the Holter monitor." The secondary effect was to determine the arrhythmias that were detected in the first 24 hours. It was noted that the Holter monitor detected 61 arrhythmias compared to 52 arrhythmias detected by the patch monitor ($p = .013$). In review of the arrhythmia types three events were considered 'clinically significant' and were ultimately detected by the patch monitor beyond the first 24 hours. In conclusion, the first seven days of AECG monitoring has the greatest detection of arrhythmias.

Kishore et al. (2014) conducted a systematic review and meta-analysis to determine the frequency of newly detected atrial fibrillation (AF) using noninvasive or invasive cardiac monitoring after ischemic stroke or transient ischaemic attack (TIA). Prospective observational studies or randomized controlled trial (RCTs) of patients with ischemic stroke, TIA, or both, who underwent any cardiac monitoring for a minimum of 12 hours, were included. A total of 32 studies were analyzed, the majority of which used inpatient, Holter, or external loop recorder monitoring. The primary outcome was detection of any new AF during the monitoring period. The investigators performed a subgroup analysis of selected (prescreened or cryptogenic) versus unselected patients and according to duration of monitoring. The overall detection rate of any AF was 11.5%, although the timing, duration, method of monitoring and reporting of diagnostic criteria used for paroxysmal AF varied. Detection rates were higher in selected (13.4%) than in unselected patients (6.2%). In cryptogenic strokes, the new AF detection rate was 15.9%. The authors concluded that detection of AF after TIA or ischemic stroke was highly variable. The results support initial inpatient telemetry and suggest that prolonged noninvasive monitoring greater than 24 hours is likely to increase yield of AF detection. The optimal method and duration of monitoring is unclear, and future appropriately designed studies are recommended.

Clinical Practice Guidelines

American Academy of Neurology (AAN)

An AAN practice guideline on stroke prevention analyzed the evidence of various technologies used to identify undetected non-valvular atrial fibrillation (AF) in patients with cryptogenic stroke. The most common technique used was Holter monitoring, followed by serial electrocardiogram (ECG), event loop recorders, inpatient continuous telemetry, outpatient transtelephonic monitoring and mobile cardiac outpatient telemetry. In patients with recent cryptogenic stroke, AAN recommends outpatient cardiac rhythm monitoring with a nonimplanted device to detect unsuspected non-valvular AF. Longer monitoring periods (e.g., one or more weeks) are associated with a greater yield (Culebras et al., 2014).

Level C - Possibly effective, ineffective or harmful (or possibly useful/predictive or not useful/predictive) for the given condition in the specified population.

American College of Cardiology (ACC)/American Heart Association (AHA)/American College of Clinical Pharmacy (ACCP)/Heart Rhythm Society (HRS)

Joglar et al. (2023) developed a guideline for the diagnosis and management of patients with atrial fibrillation (AF) using evidence-based methodologies. Recommendations from the "2014 AHA/ACC/HRS Guideline for the Management of Patients With Atrial Fibrillation" and the "2019 AHA/ACC/HRS Focused Update of the 2014 AHA/ACC/HRS Guideline for the Management of Patients With Atrial Fibrillation" were updated with new evidence. Recommendations of the guideline are summarized as follows (not all-inclusive):

- For patients who have had a systemic thromboembolic event without a known history of AF and in whom maximum sensitivity to detect AF is sought, an implantable cardiac monitor (ICM) is reasonable. (Strength of recommendation, 2A-moderate, quality of evidence, B-R-randomized).

- In patients with stroke or transient ischemic attack (TIA) of undetermined cause, initial cardiac monitoring and, if needed, extended monitoring with an implantable loop recorder are reasonable to improve detection of AF. (Strength of recommendation, 2A-moderate, quality of evidence, B-R-randomized).
- Among patients with a diagnosis of AF, it is reasonable to infer AF frequency, duration, and burden using automated algorithms available from electrocardiographic monitors, implantable cardiac monitors, and cardiac rhythm devices with an atrial lead, recognizing that periodic review can be required to exclude other arrythmias (Strength of recommendation, 2A-moderate, quality of evidence, B-NR-nonrandomized).

American College of Cardiology (ACC)/American Heart Association (AHA)/Heart Rhythm Society (HRS)

ACC/AHA/HRS guidelines on the evaluation and management of patients with bradycardia and cardiac conduction delay state that for those with daily symptoms, a 24- or 48-hour continuous ambulatory ECG (Holter monitor) is appropriate. Less frequent symptoms are best evaluated with more prolonged ambulatory ECG monitoring that can be accomplished with a broad array of modalities. In patients with infrequent symptoms (> 30 days between symptoms) suspected to be caused by bradycardia, long-term ambulatory monitoring with an implantable cardiac monitor (ICM) is reasonable if initial noninvasive evaluation is nondiagnostic (Kusumoto et al., 2019).

ACC/AHA/HRS guidelines (Shen et al., 2017) on the evaluation and management of patients with syncope address several ambulatory ECG monitoring options. The guidelines recommend that the choice of a specific monitoring system and duration should be determined on the basis of the frequency and nature of syncope events. To evaluate selected ambulatory patients with syncope of suspected arrhythmic etiology, the following external cardiac monitoring approaches can be useful:

- Holter monitor.
- Transtelephonic monitor.
- External loop recorder.
- Patch recorder.
- Mobile cardiac outpatient telemetry.

Class IIA – It is reasonable to perform procedure.Level of evidence B-NR – Based on moderate-quality evidence from one or more well-designed, well-executed nonrandomized, observational or registry studies.

AHA/ACC/HRS guidelines for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death state that a 24-hour continuous Holter recording is appropriate when symptoms occur at least once a day or when quantitation of premature ventricular complex/non sustained ventricular tachycardia is desired to assess possible ventricular arrhythmia-related depressed ventricular function. For sporadic symptoms, event or “looping” monitors are more appropriate because they can be activated over extended periods of time and increase diagnostic yield. When the suspicion of ventricular arrhythmia is high, outpatient ambulatory monitoring is inappropriate, as prompt diagnosis and prevention of ventricular arrhythmia are warranted (Al-Khatib et al., 2017).

American Heart Association (AHA)/American College of Cardiology (ACC)

Joint guidelines on the diagnosis and treatment of hypertrophic cardiomyopathy state that in the presence of symptoms, ambulatory electrocardiographic (AECG) monitoring should be continued until an individual has symptoms while wearing the monitor. In some individuals with infrequent symptoms, portable event monitors or implantable monitors may be warranted (Ommen et al., 2020).

American Heart Association (AHA)/American Stroke Association (ASA)

The AHA and ASA have issued guidelines for preventing stroke in patients with a history of stroke and transient ischemic attack (TIA). The guideline highlights that atrial fibrillation (AF) is a common and high-risk factor for secondary ischemic strokes and suggests heart rhythm monitoring for occult AF when no other cause of stroke is identified. The guideline recommends that for those with cryptogenic stroke who are not contraindicated for anticoagulation, it is reasonable to use long-term rhythm monitoring, such as mobile cardiac outpatient telemetry, ILRs, or other methods, to detect intermittent AF. The authors also recommend further research to clarify the optimal duration of heart rhythm monitoring (Kleindorfer et al., 2021).

A joint scientific statement on the prevention of stroke in patients with silent cerebrovascular disease recommends that, for patients with an embolic-appearing pattern of infarction, prolonged rhythm monitoring for atrial fibrillation (AF) be considered (Smith et al., 2017).

European Society of Cardiology (ESC)

ESC guidelines for the management of atrial fibrillation (AF) state that prompt recording of an electrocardiogram (ECG) is an effective method to document chronic forms of AF. The technology to detect paroxysmal, self-terminating AF episodes is rapidly evolving. The guideline noted that the overall post-stroke AF detection after all phases of cardiac monitoring is approximately 23.7% based on RCTs reviewed as part of the guideline development. The ESC made a strong recommendation (Class 1B) for short-term ECG recording for at least the first 24 hours followed by continuous ECG monitoring for at least 72 hours in patients with acute ischemic stroke or transient ischemic attack (TIA) whenever possible. They also recommend (Class IIa) that additional ECG monitoring using long-term non-invasive ECG monitors or insertable cardiac monitors should be considered to detect AF in selected stroke patients without previously known AF such as patients who are elderly, who have cardiovascular risk factors or comorbidities, indices of left atrial remodeling or a high C_2HEST score. The ESC also made a strong recommendation (Class I) for opportunistic screening for AF by pulse or ECG rhythm strip in patients ≥ 65 years of age and a lower recommendation (Class IIa) for consideration of systematic ECG screening to detect AF in individuals aged ≥ 75 years, or for individuals at high risk of stroke. Ongoing studies will determine whether such early detection alters management (e.g., initiation of anticoagulation) and improves outcomes. Regarding prolonged monitoring for paroxysmal AF, the guidelines state that several patient-operated devices and extended continuous ECG monitoring using skin patch recorders have been validated for the detection of paroxysmal AF. They also note that mobile health technologies are rapidly developing for AF detection and other purposes and that caution is needed in their clinical use as many are not clinically validated. Prolonged ECG monitoring is also reasonable in survivors of ischemic stroke without an established diagnosis of AF (Hindricks et al., 2021).

European Stroke Organisation (ESO)

The ESO guideline on screening subclinical atrial fibrillation (AF), after stroke or transient ischemic attack (TIA) of undetermined origin recommends, a prolonged cardiac monitoring instead of standard 24 hour monitoring to increase the detection of subclinical AF in adult patients. The guideline also we suggests the use of implantable devices for cardiac monitoring instead of non-implantable devices to increase the detection of subclinical AF (Rubiera et al., 2022).

Heart Rhythm Society (HRS)/European Heart Rhythm Association (EHRA)/European Cardiac Arrhythmia Society (ECAS) et al.

In a consensus statement on ablation of atrial fibrillation (AF), the HRS, in collaboration with several other organizations, states that arrhythmia monitoring can be performed with the use of noncontinuous or continuous ECG monitoring tools. Choice of either method depends on individual needs and consequences of arrhythmia detection. More intensive monitoring is associated with a greater likelihood of detecting both symptomatic and asymptomatic AF. No specific guidelines are provided regarding the optimal monitoring system (Calkins et al., 2017).

Heart Rhythm Society (HRS)/International Society for Holter and Noninvasive Electrocardiology (ISHNE)

Steinberg et al. (2017) provides a consensus statement that outlined the limitations, clinical indications, pharmacological treatment of arrhythmias, and the use of external monitoring for pacemaker malfunctioning/placement. It is noted that for the selection of specific ambulatory electrocardiographic (AECG) monitors, one must consider the diagnostic power, the monitoring capability and the accuracy, local availability, symptom frequency, patient compliance and the condition of the patient. Within the article there are descriptions of advantages and limitations associated with each AECG monitor. The clinical indications for use of the various types of monitors can include the following: syncope, bradyarrhythmia, tachyarrhythmia, palpitations, chest pain and coronary ischemia, ischemic heart diseases and postinfarction, hypertrophic cardiomyopathy, arrhythmic right ventricular dysplasia/cardiomyopathy, Wolff-Parkinson-White syndrome, inherited primary arrhythmic diseases, Short or Long QT syndrome, Brugada syndrome, catecholaminergic polymorphic ventricular tachycardias, early repolarization syndromes, idiopathic ventricular fibrillation with nonischemic dilated cardiomyopathy, dialysis and chronic kidney disease associated arrhythmias. It is noted that the use of monitoring with AECG for neurological and muscular disease is controversial. The article further indicates an appropriate clinical assessment may include a continuous AECG, and if unsuccessful, additional monitoring should include an intermittent external loop recording. If patients remain undiagnosed after prolonged noninvasive monitoring, an internal loop recorder (ILR) may be necessary.

National Institute for Health and Care Excellence (NICE)

In a guideline on the management of atrial fibrillation (AF), NICE recommends the following in patients with suspected paroxysmal AF undetected by 12-lead ECG recording:

- A 24-hour ambulatory ECG monitor should be used in those with suspected asymptomatic episodes or symptomatic episodes less than 24 hours apart.

- An ambulatory ECG monitor, event recorder, or other ECG technology should be used in those with symptomatic episodes more than 24 hours apart. (NICE, 2021).

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

For information on ambulatory ECG devices, cardiac telemetry or implantable loop recorders, refer to the following website (use product codes DSI, MXD, and DXH): http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm. (Accessed July 9, 2025)

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Policy History/Revision Information

Date	Summary of Changes
09/01/2025	**Coverage Rationale** ***CMS Local Coverage Determinations (LCDs) and Articles*** • Replaced instruction to refer to the UnitedHealthcare Commercial Medical Policy titled *Implantable Loop Recorders and Wearable Heart Rhythm Monitors* for *clinical coverage guidance when the Local Coverage Determinations (LCDs)/Local Coverage Articles (LCAs) are silent on coverage criteria* for implantable loop recorders" with "refer to the UnitedHealthcare Commercial Medical Policy titled *Implantable Loop Recorders and Wearable Heart Rhythm Monitors* for clinical coverage guidance for *coverage guidelines* for implantable loop recorders" **Applicable Codes** ***CPT Codes*** • Added 0937T, 0938T, 0939T, and 0940T ***Diagnosis Codes*** For CPT Codes 93224, 93225, 93226, 93227, 93228, 93229, 93241, 93242, 93243, 93244, 93245, 93246, 93247, 93248, 93268, 93270, 93271, and 93272 • Removed I20.8, I24.8, and I47.1 For CPT Codes 0937T, 0938T, 0939T, and 0940T • Added list of applicable codes: G45.3, G45.8, G45.9, G90.01, I20.0, I20.1, I20.81, I20.89, I21.01, I21.02, I21.09, I21.11, I21.19, I21.21, I21.29, I21.4, I21.A1, I21.A9, I21.B, I22.0, I22.1, I22.2, I22.8, I23.7, I24.81, I24.89, I25.10, I25.110, I25.111, I25.112, I25.118, I25.2, I25.3, I25.41, I25.5, I25.6, I25.710, I25.711, I25.712, I25.718, I25.720, I25.721, I25.722, I25.728, I25.730, I25.731, I25.732, I25.738, I25.750, I25.751, I25.752, I25.758, I25.760, I25.761, I25.762, I25.768, I25.790, I25.791, I25.792, I25.798, I25.810, I25.811, I25.812, I25.82, I25.83, I25.84, I25.85, I25.89, I42.0, I42.1, I42.2, I42.3, I42.4, I42.5, I42.6, I42.7, I42.8, I43, I44.0, I44.1, I44.2, I44.39, I44.4, I44.5, I44.69, I45.0, I45.19, I45.2, I45.3, I45.5, I45.6, I45.81, I45.89, I46.2, I46.8, I47.0, I47.11, I47.19, I47.21, I47.29, I48.0, I48.11, I48.19, I48.20, I48.21, I48.3, I48.4,

Date	Summary of Changes
	I48.91, I48.92, I49.01, I49.02, I49.1, I49.2, I49.3, I49.49, I49.5, I49.8, I5A, I63.9, I97.120, I97.121, I97.190, I97.191, Q20.3, Q20.5, Q20.8, Q20.9, Q21.11, Q21.12, Q21.13, Q21.21, Q21.22, Q21.23, Q21.3, Q24.6, R00.0, R00.1, R00.2, R00.8, R06.00, R06.01, R06.02, R06.09, R07.1, R07.2, R07.89, R07.9, R10.13, R40.4, R42, R55, Z86.73, and Z86.74 **Supporting Information** • Updated *Clinical Evidence* and *References* sections to reflect the most current information • Archived previous policy version MMP109.17

Instructions for Use

The Medicare Advantage Policy documents are generally used to support UnitedHealthcare coverage decisions. It is expected providers retain or have access to appropriate documentation when requested to support coverage. This document may be used as a guide to help determine applicable:

- Medical necessity coverage guidelines; including documentation requirements, and/or
- Medicare coding or billing requirements.

Medicare Advantage Policies are applicable to UnitedHealthcare Medicare Advantage Plans offered by UnitedHealthcare and its affiliates. This Policy is provided for informational purposes and does not constitute medical advice. It is intended to serve only as a general reference and is not intended to address every aspect of a clinical situation. Physicians and patients should not rely on this information in making health care decisions. Physicians and patients must exercise their independent clinical discretion and judgment in determining care. Treating physicians and healthcare providers are solely responsible for determining what care to provide to their patients. Members should always consult their physician before making any decisions about medical care.

Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The member specific benefit plan document identifies which services are covered, which are excluded, and which are subject to limitations. In the event of a conflict, the member specific benefit plan document supersedes this policy. For more information on a specific member's benefit coverage, please call the customer service number on the back of the member ID card or refer to the Administrative Guide.

Medicare Advantage Policies are developed as needed, are regularly reviewed, and updated, and are subject to change. They represent a portion of the resources used to support UnitedHealthcare coverage decision making. UnitedHealthcare may modify these Policies at any time by publishing a new version on this website. Medicare source materials used to develop these policies may include, but are not limited to, CMS statutes, regulations, National Coverage Determinations (NCDs), Local Coverage Determinations (LCDs), and manuals. This document is not a replacement for the Medicare source materials that outline Medicare coverage requirements. The information presented in this Policy is believed to be accurate and current as of the date of publication. Where there is a conflict between this document and Medicare source materials, the Medicare source materials apply. Medicare Advantage Policies are the property of UnitedHealthcare. Unauthorized copying, use, and distribution of this information are strictly prohibited.

UnitedHealthcare follows Medicare coverage guidelines found in statutes, regulations, NCDs, and LCDs to determine coverage. The clinical coverage criteria governing certain items or services referenced in this Medical Policy have not been fully established in applicable Medicare guidelines because there is an absence of any applicable Medicare statutes, regulations, NCDs, or LCDs setting forth coverage criteria and/or the applicable NCDs or LCDs include flexibility that explicitly allows for coverage in circumstances beyond the specific indications that are listed in an NCD or LCD. As a result, in these circumstances, UnitedHealthcare applies internal coverage criteria as referenced in this Medical Policy. The internal coverage criteria in this Medical Policy was developed through an evaluation of the current relevant clinical evidence in acceptable clinical literature and/or widely used treatment guidelines. UnitedHealthcare evaluated the evidence to determine whether it was of sufficient quality to support a finding that the items or services discussed in the policy might, under certain circumstances, be reasonable and necessary for the diagnosis or treatment of illness or injury or to improve the functioning of a malformed body member.

Providers are responsible for submission of accurate claims. Medicare Advantage Policies are intended to ensure that coverage decisions are made accurately. UnitedHealthcare Medicare Advantage Policies use Current Procedural Terminology (CPT®), Centers for Medicare and Medicaid Services (CMS), or other coding guidelines. References to CPT® or other sources are for definitional purposes only and do not imply any right to reimbursement or guarantee claims payment.

For members in UnitedHealthcare Medicare Advantage plans where a delegate manages utilization management and prior authorization requirements, the delegate's requirements need to be followed.