Medical Coverage Policy

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Ambulatory External and Implantable Electrocardiographic Monitoring

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INSTRUCTIONS FOR USE

The following Coverage Policy applies to health benefit plans administered by Cigna Companies. Certain Cigna Companies and/or lines of business only provide utilization review services to clients and do not make coverage determinations. References to standard benefit plan language and coverage determinations do not apply to those clients. Coverage Policies are intended to provide guidance in interpreting certain standard benefit plans administered by Cigna Companies. Please note, the terms of a customer's particular benefit plan document [Group Service Agreement, Evidence of Coverage, Certificate of Coverage, Summary Plan Description (SPD) or similar plan document] may differ significantly from the standard benefit plans upon which these Coverage Policies are based. For example, a customer's benefit plan document may contain a specific exclusion related to a topic addressed in a Coverage Policy. In the event of a conflict, a customer's benefit plan document always supersedes the information in the Coverage Policies. In the absence of a controlling federal or state coverage mandate, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of 1) the terms of the applicable benefit plan document in effect on the date of service; 2) any applicable laws/regulations; 3) any relevant collateral source materials including Coverage Policies and; 4) the specific facts of the particular situation. Each coverage request should be reviewed on its own merits. Medical directors are expected to exercise clinical judgment where appropriate and have discretion in making individual coverage determinations. Where coverage for care or services does not depend on specific circumstances, reimbursement will only be provided if a requested service(s) is submitted in accordance with the relevant criteria outlined in the applicable Coverage Policy, including covered diagnosis and/or procedure code(s). Reimbursement is not allowed for services when billed for conditions or diagnoses that are not

covered under this Coverage Policy (see "Coding Information" below). When billing, providers must use the most appropriate codes as of the effective date of the submission. Claims submitted for services that are not accompanied by covered code(s) under the applicable Coverage Policy will be denied as not covered. Coverage Policies relate exclusively to the administration of health benefit plans. Coverage Policies are not recommendations for treatment and should never be used as treatment guidelines. In certain markets, delegated vendor guidelines may be used to support medical necessity and other coverage determinations.

Overview

This Coverage Policy addresses the use of ambulatory electrocardiographic monitoring with the exception of Holter monitoring.

Coverage Policy

Ambulatory External Cardiac Monitoring

Ambulatory external cardiac monitoring from 48 hours to 30 days (Current Procedural Terminology [CPT®] codes 93241–93248, 93268, 93270-93272, 0937T-0940T is considered medically necessary when ANY of the following criteria are met:

- symptoms of presyncope, syncope, or severe palpitations when there is clinical suspicion of a significant bradyarrhythmia or tachyarrhythmia
- evaluation of atrial fibrillation for rhythm and/or rate control when the results will directly impact clinical decision-making (pre- and/or post-ablation)
- following stroke or transient ischemic attack (TIA) of undetermined cause (CPT® 93268, 93270-93272)
- following cavotricuspid isthmus (CTI) ablation for typical atrial flutter (AFL) if individual is not receiving ongoing anticoagulation and deemed to be at high thromboembolic risk (e.g., CHA_2DS_2-VASc* score ≥2).
- individual with hypertrophic cardiomyopathy
- individual with atrial fibrillation-induced cardiomyopathy who have recovered left ventricular function
- if an individual is identified with atrial fibrillation in the setting of acute medical illness or surgery, especially in those who underwent noncardiac surgery and with risk factors for stroke (e.g., CHA_2DS_2-VASc* score ≥2)

Ambulatory external cardiac monitoring from 48 hours to 30 days is considered not covered or reimbursable for ANY other indication including ST segment analysis.

Mobile Cardiac Monitoring with Telemetry

Mobile cardiac outpatient telemetry (MCOT or MCT) (CPT codes 93228, 93229) is considered medically necessary when ambulatory external cardiac monitoring is non-diagnostic and ANY of the following criteria are met:

- symptoms of presyncope, syncope, or severe palpitations when there is clinical suspicion of a significant bradyarrhythmia or tachyarrhythmia
- evaluation of atrial fibrillation for rhythm and/or rate control when the results will directly impact clinical decision-making (pre- and/or post-ablation)
- following stroke or transient ischemic attack (TIA) of undetermined cause
- following cavotricuspid isthmus (CTI) ablation for typical atrial flutter (AFL) if individual is not receiving ongoing anticoagulation and deemed to be at high thromboembolic risk (e.g., CHA_2DS_2-VASc* score ≥2)
- individual with hypertrophic cardiomyopathy
- individual with atrial fibrillation-induced cardiomyopathy who have recovered left ventricular function
- if an individual is identified with atrial fibrillation in the setting of acute medical illness or surgery, especially in those who underwent noncardiac surgery and with risk factors for stroke (e.g., CHA_2DS_2-VASc* score ≥2)

Mobile cardiac monitoring is not covered or reimbursable for ANY other indication.

Ambulatory Implantable Cardiac Event Monitoring - ADULT

An implantable electrocardiographic event monitor (i.e., implantable loop recorder [ILR]) (CPT code 33285; Healthcare Common Procedure Coding System [HCPCS] Code C1764 is considered medically necessary when ANY of the following criteria are met:

- recurrent or unexplained syncope when BOTH of the following criteria are met:
  - non-arrhythmic causes have been excluded by appropriate testing (e.g., reflex syncope, orthostatic hypotension, volume depletion, dehydration, blood loss)
  - noninvasive ambulatory cardiac monitoring for a minimum of 14 days is inconclusive or non-diagnostic (e.g., patch monitors, external event monitors)
- following cryptogenic stroke, transient ischemic attack (TIA), or systemic thromboembolic event with suspected atrial fibrillation when a minimum of 14 days of noninvasive ambulatory cardiac monitoring is inconclusive or non-diagnostic
- following cavotricuspid isthmus (CTI) ablation for typical atrial flutter (AFL) if individual is not receiving ongoing anticoagulation and deemed to be at high thromboembolic risk (e.g., CHA_2DS_2-VASc* score ≥2).
- individual with atrial fibrillation-induced cardiomyopathy who have recovered left ventricular function
- if an individual is identified with atrial fibrillation in the setting of acute medical illness or surgery, especially in those who underwent noncardiac surgery and with risk factors for stroke (e.g., CHA_2DS_2-VASc* score ≥2)

The replacement of an implantable electrocardiographic event monitor is considered medically necessary for an individual who continues to meet ALL of the above criteria and the existing monitor is no longer under warranty and cannot be repaired (e.g., device is nearing the end of its battery life).

The use of an implantable electrocardiographic event monitor (i.e., implantable loop recorder) for ANY other indication including routine monitoring of a documented arrhythmia or assessing the effectiveness of arrhythmia treatment is considered not medically necessary.

* CHA_2DS_2-VASc is a clinical risk score for prediction of stroke and systemic embolism: Congestive heart failure or left ventricular dysfunction, hypertension, age ≥75 (doubled), diabetes, stroke (doubled)-vascular disease, age 65–74, sex category.

Ambulatory Implantable Cardiac Event Monitoring - PEDIATRIC

An implantable electrocardiographic event monitor (i.e., implantable loop recorder [ILR]) (CPT code 33285; HCPCS Code C1764) is considered medically necessary in an individual (≤21 years of age) when an external monitor has not demonstrated the symptoms of concern and ANY of the following criteria are met:

- syncope of uncertain origin and individual does not have conventional indications for a pacemaker or implantable cardioverter defibrillator (ICD)
- recurrent syncope of uncertain origin but not a high risk of sudden cardiac death (SCD)
- infrequent symptoms (>30-day intervals) suspected to be due to an arrhythmia, when the initial noninvasive evaluation is nondiagnostic
- symptomatic cardiac channelopathies or structural heart diseases associated with significant rhythm abnormalities, for guiding the management

The use of an implantable electrocardiographic event monitor (i.e., implantable loop recorder) for any other indication, including but not limited to the following, is considered not medically necessary:

- suspected reflex syncope presenting with frequent or severe syncopal episodes
- suspected epilepsy in whom anticonvulsive treatment has proven ineffective
- severe but infrequent palpitations when other monitoring methods have failed to document an underlying cause
- for detecting subclinical arrhythmias (asymptomatic) in an individual with cardiac channelopathies or other diseases associated with significant rhythm abnormalities, for guiding the management

Cardiac Self-Monitoring

Cigna does not cover ANY of the following for any indication because each is considered a convenience item and/or not covered or reimbursable:

- a self-monitoring device that includes an electrocardiographic (ECG) monitor combined with a cellular telephone, watch or other personal electronic device
- software or hardware required for downloading ECG data to a device such as personal computer, smart phone, or tablet

Coding Information

Notes:

1. This list of codes may not be all-inclusive since the American Medical Association (AMA) and Centers for Medicare & Medicaid Services (CMS) code updates may occur more frequently than policy updates.
2. Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement.

Ambulatory External Cardiac Monitoring

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

CPT®* Codes	Description
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
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
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
0938T	External electrocardiographic recording for greater than 15 days up to 30 days by continuous rhythm recording and storage; including recording, scanning

CPT®* Codes	Description
	analysis with report, review and interpretation by a physician or other qualified health care professional recording (including connection and initial recording)
0939T	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 scanning analysis with report
0940T	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 review and interpretation by a physician or other qualified health care professional

ICD-10-CM Diagnosis Codes	Description
D73.5	Infarction of spleen
D86.85	Sarcoid myocarditis
E05.00	Thyrotoxicosis with diffuse goiter without thyrotoxic crisis or storm
E05.91	Thyrotoxicosis, unspecified with thyrotoxic crisis or storm
E06.3	Autoimmune thyroiditis
E75.21	Fabry (-Anderson) disease
E85.4	Organ-limited amyloidosis
G40.001	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, not intractable, with status epilepticus
G40.009	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, not intractable, without status epilepticus
G40.011	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, intractable, with status epilepticus
G40.019	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, intractable, without status epilepticus
G40.101	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, with status epilepticus
G40.109	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus
G40.119	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus
G40.209	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, without status epilepticus
G40.219	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, without status epilepticus
G40.309	Generalized idiopathic epilepsy and epileptic syndromes, not intractable, without status epilepticus
G40.319	Generalized idiopathic epilepsy and epileptic syndromes, intractable, without status epilepticus
G40.A09	Absence epileptic syndrome, not intractable, without status epilepticus
G40.B09	Juvenile myoclonic epilepsy, not intractable, without status epilepticus
G40.C09	Lafora progressive myoclonus epilepsy, not intractable, without status epilepticus

ICD-10-CM Diagnosis Codes	Description
G40.419	Other generalized epilepsy and epileptic syndromes, intractable, without status epilepticus
G40.509	Epileptic seizures related to external causes, not intractable, without status epilepticus
G40.802	Other epilepsy, not intractable, without status epilepticus
G40.804	Other epilepsy, intractable, without status epilepticus
G40.841	KCNQ2-related epilepsy, not intractable, with status epilepticus
G40.842	KCNQ2-related epilepsy, not intractable, without status epilepticus
G40.843	KCNQ2-related epilepsy, intractable, with status epilepticus
G40.844	KCNQ2-related epilepsy, intractable, without status epilepticus
G45.0	Vertebro-basilar artery syndrome
G45.2	Multiple and bilateral precerebral artery syndromes
G45.3	Amaurosis fugax
G46.0	Middle cerebral artery syndrome
G46.1	Anterior cerebral artery syndrome
G46.2	Posterior cerebral artery syndrome
G46.3	Brain stem stroke syndrome
G46.4	Cerebellar stroke syndrome
G46.5	Pure motor lacunar syndrome
G46.6	Pure sensory lacunar syndrome
G47.419	Narcolepsy without cataplexy
G83.23	Monoplegia of upper limb affecting right nondominant side
G83.24	Monoplegia of upper limb affecting left nondominant side
G90.3	Multi-system degeneration of the autonomic nervous system
H34.01	Transient retinal artery occlusion, right eye
H34.02	Transient retinal artery occlusion, left eye
H34.03	Transient retinal artery occlusion, bilateral
H34.11-H34.13	Central retinal artery occlusion
H34.211-H34.213	Partial retinal artery occlusion
H34.231-H34.233	Retinal artery branch occlusion
H47.011-H47.013	Ischemic optic neuropathy
H53.121	Transient visual loss, right eye
H53.122	Transient visual loss, left eye
H53.123	Transient visual loss, bilateral
H53.131-H53.133	Sudden visual loss
H53.2	Diplopia
I25.42	Coronary artery dissection
I25.5	Ischemic cardiomyopathy
I40.0-I40.9	Acute myocarditis
I41	Myocarditis in diseases classified elsewhere
I42.1-I42.3	Cardiomyopathy
I44.1	Atrioventricular block, second degree

ICD-10-CM Diagnosis Codes	Description
I44.2	Atrioventricular block, complete
I45.3	Trifascicular block
I45.6	Pre-excitation syndrome
I45.81	Long QT syndrome
I46.2-I46.9	Cardiac arrest
I47.0	Re-entry ventricular arrhythmia
I47.11	Inappropriate sinus tachycardia, so stated
I47.19	Other supraventricular tachycardia
I47.21	Torsades de pointes
I48.0	Paroxysmal atrial fibrillation
I48.11	Longstanding persistent atrial fibrillation
I48.3	Typical atrial flutter
I48.4	Atypical atrial flutter
I49.01-I49.02	Ventricular fibrillation and flutter
I49.1	Atrial premature depolarization
I49.2	Junctional premature depolarization
I49.3	Ventricular premature depolarization
I49.5	Sick sinus syndrome
I50.21-I50.23	Systolic (congestive) heart failure
I50.31-I50.33	Diastolic (congestive) heart failure
I50.41-I50.43	Combined systolic (congestive) and diastolic (congestive) heart failure
I50.811-I50.84	Other heart failure
I51.81	Takotsubo syndrome
I5A	Non-ischemic myocardial injury (non-traumatic)
I63.00-I63.19	Cerebral infarction
I63.20	Cerebral infarction due to unspecified occlusion or stenosis of unspecified precerebral arteries
I63.211	Cerebral infarction due to unspecified occlusion or stenosis of right vertebral artery
I63.212	Cerebral infarction due to unspecified occlusion or stenosis of left vertebral artery
I63.213	Cerebral infarction due to unspecified occlusion or stenosis of bilateral vertebral arteries
I63.22	Cerebral infarction due to unspecified occlusion or stenosis of basilar artery
I63.231	Cerebral infarction due to unspecified occlusion or stenosis of right carotid arteries
I63.232	Cerebral infarction due to unspecified occlusion or stenosis of left carotid arteries
I63.233	Cerebral infarction due to unspecified occlusion or stenosis of bilateral carotid arteries
I63.29	Cerebral infarction due to unspecified occlusion or stenosis of other precerebral arteries

ICD-10-CM Diagnosis Codes	Description
I63.30-I63.49	Cerebral infarction
I63.511	Cerebral infarction due to unspecified occlusion or stenosis of right middle cerebral artery
I63.512	Cerebral infarction due to unspecified occlusion or stenosis of left middle cerebral artery
I63.513	Cerebral infarction due to unspecified occlusion or stenosis of bilateral middle cerebral arteries
I63.521	Cerebral infarction due to unspecified occlusion or stenosis of right anterior cerebral artery
I63.522	Cerebral infarction due to unspecified occlusion or stenosis of left anterior cerebral artery
I63.523	Cerebral infarction due to unspecified occlusion or stenosis of bilateral anterior cerebral arteries
I63.531	Cerebral infarction due to unspecified occlusion or stenosis of right posterior cerebral artery
I63.532	Cerebral infarction due to unspecified occlusion or stenosis of left posterior cerebral artery
I63.533	Cerebral infarction due to unspecified occlusion or stenosis of bilateral posterior cerebral arteries
I63.541	Cerebral infarction due to unspecified occlusion or stenosis of right cerebellar artery
I63.542	Cerebral infarction due to unspecified occlusion or stenosis of left cerebellar artery
I63.543	Cerebral infarction due to unspecified occlusion or stenosis of bilateral cerebellar arteries
I63.59	Cerebral infarction due to unspecified occlusion or stenosis of other cerebral artery
I63.81	Other cerebral infarction due to occlusion or stenosis of small artery
I63.89	Other cerebral infarction
I63.9	Cerebral infarction, unspecified
I67.81	Acute cerebrovascular insufficiency
I67.82	Cerebral ischemia
I69.020	Aphasia following nontraumatic subarachnoid hemorrhage
I69.021	Dysphasia following nontraumatic subarachnoid hemorrhage
I69.120	Aphasia following nontraumatic intracerebral hemorrhage
I69.121	Dysphasia following nontraumatic intracerebral hemorrhage
I69.220	Aphasia following other nontraumatic intracranial hemorrhage
I69.221	Dysphasia following other nontraumatic intracranial hemorrhage
I69.310	Attention and concentration deficit following cerebral infarction
I69.311	Memory deficit following cerebral infarction
I69.312	Visuospatial deficit and spatial neglect following cerebral infarction
I69.313	Psychomotor deficit following cerebral infarction
I69.314	Frontal lobe and executive function deficit following cerebral infarction
I69.315	Cognitive social or emotional deficit following cerebral infarction
I69.318	Other symptoms and signs involving cognitive functions following cerebral infarction
I69.320	Aphasia following cerebral infarction

ICD-10-CM Diagnosis Codes	Description
I69.321	Dysphasia following cerebral infarction
I69.322	Dysarthria following cerebral infarction
I69.323	Fluency disorder following cerebral infarction
I69.331	Monoplegia of upper limb following cerebral infarction affecting right dominant side
I69.332	Monoplegia of upper limb following cerebral infarction affecting left dominant side
I69.333	Monoplegia of upper limb following cerebral infarction affecting right non-dominant side
I69.334	Monoplegia of upper limb following cerebral infarction affecting left non-dominant side
I69.339	Monoplegia of upper limb following cerebral infarction affecting unspecified side
I69.341	Monoplegia of lower limb following cerebral infarction affecting right dominant side
I69.342	Monoplegia of lower limb following cerebral infarction affecting left dominant side
I69.343	Monoplegia of lower limb following cerebral infarction affecting right non-dominant side
I69.344	Monoplegia of lower limb following cerebral infarction affecting left non-dominant side
I69.349	Monoplegia of lower limb following cerebral infarction affecting unspecified side
I69.351	Hemiplegia and hemiparesis following cerebral infarction affecting right dominant side
I69.352	Hemiplegia and hemiparesis following cerebral infarction affecting left dominant side
I69.353	Hemiplegia and hemiparesis following cerebral infarction affecting right non-dominant side
I69.354	Hemiplegia and hemiparesis following cerebral infarction affecting left non-dominant side
I69.390	Apraxia following cerebral infarction
I69.391	Dysphagia following cerebral infarction
I69.392	Facial weakness following cerebral infarction
I69.393	Ataxia following cerebral infarction
I74.01	Saddle embolus of abdominal aorta
I74.09	Other arterial embolism and thrombosis of abdominal aorta
I74.10	Embolism and thrombosis of unspecified parts of aorta
I74.11	Embolism and thrombosis of thoracic aorta
I74.19	Embolism and thrombosis of other parts of aorta
I74.2	Embolism and thrombosis of arteries of the upper extremities
I74.3	Embolism and thrombosis of arteries of the lower extremities
I74.5	Embolism and thrombosis of iliac artery
I74.8	Embolism and thrombosis of other arteries
I97.810-I97.821	Other intraoperative and postprocedural complications and disorders of the circulatory system, not elsewhere classified
N28.0	Ischemia and infarction of kidney
O14.10-O14.15	Severe pre-eclampsia
O90.3	Peripartum cardiomyopathy
P28.40	Unspecified apnea of newborn

ICD-10-CM Diagnosis Codes	Description
P28.41	Central neonatal apnea of newborn
P28.43	Mixed neonatal apnea of newborn
P28.49	Other apnea of newborn
P29.0-P29.89	Cardiovascular disorders originating in the perinatal period
Q20.0-Q20.8	Congenital malformations of cardiac chambers and connections
R00.2	Palpitations
R29.5	Transient paralysis
R29.6	Repeated falls
R29.702	NIHSS score 2
R29.810	Facial weakness
R40.4	Transient alteration of awareness
R42	Dizziness and giddiness
R47.01	Aphasia
R47.02	Dysphasia
R47.1	Dysarthria and anarthria
R47.81	Slurred speech
R55	Syncope and collapse
R56.1	Post traumatic seizures
R68.13	Apparent life threatening event in infant (ALTE)
Z82.41	Family history of sudden cardiac death
Z84.82	Family history of sudden infant death syndrome
Z86.73	Personal history of transient ischemic attack (TIA), and cerebral infarction without residual deficits
Z86.74	Personal history of sudden cardiac arrest
Z87.74	Personal history of (corrected) congenital malformations of heart and circulatory system

Not Covered or Reimbursable:

ICD-10-CM Diagnosis Codes	Description
	All other codes

<u>Mobile Cardiac Monitoring with Telemetry</u>

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

CPT®* Codes	Description
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

CPT®* Codes	Description
	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

ICD-10-CM Diagnosis Codes	Description
D73.5	Infarction of spleen
D86.85	Sarcoid myocarditis
E05.00	Thyrotoxicosis with diffuse goiter without thyrotoxic crisis or storm
E05.91	Thyrotoxicosis, unspecified with thyrotoxic crisis or storm
E06.3	Autoimmune thyroiditis
E75.21	Fabry (-Anderson) disease
E85.4	Organ-limited amyloidosis
G40.001	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, not intractable, with status epilepticus
G40.009	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, not intractable, without status epilepticus
G40.011	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, intractable, with status epilepticus
G40.019	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, intractable, without status epilepticus
G40.101	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, with status epilepticus
G40.109	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus
G40.119	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus
G40.209	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, without status epilepticus
G40.219	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, without status epilepticus
G40.309	Generalized idiopathic epilepsy and epileptic syndromes, not intractable, without status epilepticus
G40.319	Generalized idiopathic epilepsy and epileptic syndromes, intractable, without status epilepticus
G40.A09	Absence epileptic syndrome, not intractable, without status epilepticus
G40.B09	Juvenile myoclonic epilepsy, not intractable, without status epilepticus
G40.C09	Lafora progressive myoclonus epilepsy, not intractable, without status epilepticus
G40.419	Other generalized epilepsy and epileptic syndromes, intractable, without status epilepticus

ICD-10-CM Diagnosis Codes	Description
G40.509	Epileptic seizures related to external causes, not intractable, without status epilepticus
G40.802	Other epilepsy, not intractable, without status epilepticus
G40.804	Other epilepsy, intractable, without status epilepticus
G40.841	KCNQ2-related epilepsy, not intractable, with status epilepticus
G40.842	KCNQ2-related epilepsy, not intractable, without status epilepticus
G40.843	KCNQ2-related epilepsy, intractable, with status epilepticus
G40.844	KCNQ2-related epilepsy, intractable, without status epilepticus
G45.0	Vertebro-basilar artery syndrome
G45.2	Multiple and bilateral precerebral artery syndromes
G45.3	Amaurosis fugax
G46.0	Middle cerebral artery syndrome
G46.1	Anterior cerebral artery syndrome
G46.2	Posterior cerebral artery syndrome
G46.3	Brain stem stroke syndrome
G46.4	Cerebellar stroke syndrome
G46.5	Pure motor lacunar syndrome
G46.6	Pure sensory lacunar syndrome
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G83.23	Monoplegia of upper limb affecting right nondominant side
G83.24	Monoplegia of upper limb affecting left nondominant side
G90.3	Multi-system degeneration of the autonomic nervous system
H34.01	Transient retinal artery occlusion, right eye
H34.02	Transient retinal artery occlusion, left eye
H34.03	Transient retinal artery occlusion, bilateral
H34.11-H34.13	Central retinal artery occlusion
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H34.231-H34.233	Retinal artery branch occlusion
H47.011-H47.013	Ischemic optic neuropathy
H53.121	Transient visual loss, right eye
H53.122	Transient visual loss, left eye
H53.123	Transient visual loss, bilateral
H53.131-H53.133	Sudden visual loss
H53.2	Diplopia
I25.42	Coronary artery dissection
I25.5	Ischemic cardiomyopathy
I40.0-I40.9	Acute myocarditis
I41	Myocarditis in diseases classified elsewhere
I42.1-I42.3	Cardiomyopathy
I44.1	Atrioventricular block, second degree
I44.2	Atrioventricular block, complete
I45.3	Trifascicular block

ICD-10-CM Diagnosis Codes	Description
I45.6	Pre-excitation syndrome
I45.81	Long QT syndrome
I46.2-I46.9	Cardiac arrest
I47.0	Re-entry ventricular arrhythmia
I47.11	Inappropriate sinus tachycardia, so stated
I47.19	Other supraventricular tachycardia
I47.21	Torsades de pointes
I48.0	Paroxysmal atrial fibrillation
I48.11	Longstanding persistent atrial fibrillation
I48.3	Typical atrial flutter
I48.4	Atypical atrial flutter
I49.01-I49.02	Ventricular fibrillation and flutter
I49.1	Atrial premature depolarization
I49.2	Junctional premature depolarization
I49.3	Ventricular premature depolarization
I49.5	Sick sinus syndrome
I50.21-I50.23	Systolic (congestive) heart failure
I50.31-I50.33	Diastolic (congestive) heart failure
I50.41-I50.43	Combined systolic (congestive) and diastolic (congestive) heart failure
I50.811-I50.84	Other heart failure
I51.81	Takotsubo syndrome
I5A	Non-ischemic myocardial injury (non-traumatic)
I63.00-I63.19	Cerebral infarction
I63.20	Cerebral infarction due to unspecified occlusion or stenosis of unspecified precerebral arteries
I63.211	Cerebral infarction due to unspecified occlusion or stenosis of right vertebral artery
I63.212	Cerebral infarction due to unspecified occlusion or stenosis of left vertebral artery
I63.213	Cerebral infarction due to unspecified occlusion or stenosis of bilateral vertebral arteries
I63.22	Cerebral infarction due to unspecified occlusion or stenosis of basilar artery
I63.231	Cerebral infarction due to unspecified occlusion or stenosis of right carotid arteries
I63.232	Cerebral infarction due to unspecified occlusion or stenosis of left carotid arteries
I63.233	Cerebral infarction due to unspecified occlusion or stenosis of bilateral carotid arteries
I63.29	Cerebral infarction due to unspecified occlusion or stenosis of other precerebral arteries
I63.30-I63.49	Cerebral infarction

ICD-10-CM Diagnosis Codes	Description
I63.511	Cerebral infarction due to unspecified occlusion or stenosis of right middle cerebral artery
I63.512	Cerebral infarction due to unspecified occlusion or stenosis of left middle cerebral artery
I63.513	Cerebral infarction due to unspecified occlusion or stenosis of bilateral middle cerebral arteries
I63.521	Cerebral infarction due to unspecified occlusion or stenosis of right anterior cerebral artery
I63.522	Cerebral infarction due to unspecified occlusion or stenosis of left anterior cerebral artery
I63.523	Cerebral infarction due to unspecified occlusion or stenosis of bilateral anterior cerebral arteries
I63.531	Cerebral infarction due to unspecified occlusion or stenosis of right posterior cerebral artery
I63.532	Cerebral infarction due to unspecified occlusion or stenosis of left posterior cerebral artery
I63.533	Cerebral infarction due to unspecified occlusion or stenosis of bilateral posterior cerebral arteries
I63.541	Cerebral infarction due to unspecified occlusion or stenosis of right cerebellar artery
I63.542	Cerebral infarction due to unspecified occlusion or stenosis of left cerebellar artery
I63.543	Cerebral infarction due to unspecified occlusion or stenosis of bilateral cerebellar arteries
I63.59	Cerebral infarction due to unspecified occlusion or stenosis of other cerebral artery
I63.81	Other cerebral infarction due to occlusion or stenosis of small artery
I63.89	Other cerebral infarction
I63.9	Cerebral infarction, unspecified
I67.81	Acute cerebrovascular insufficiency
I67.82	Cerebral ischemia
I69.020	Aphasia following nontraumatic subarachnoid hemorrhage
I69.021	Dysphasia following nontraumatic subarachnoid hemorrhage
I69.120	Aphasia following nontraumatic intracerebral hemorrhage
I69.121	Dysphasia following nontraumatic intracerebral hemorrhage
I69.220	Aphasia following other nontraumatic intracranial hemorrhage
I69.221	Dysphasia following other nontraumatic intracranial hemorrhage
I69.310	Attention and concentration deficit following cerebral infarction
I69.311	Memory deficit following cerebral infarction
I69.312	Visuospatial deficit and spatial neglect following cerebral infarction
I69.313	Psychomotor deficit following cerebral infarction
I69.314	Frontal lobe and executive function deficit following cerebral infarction
I69.315	Cognitive social or emotional deficit following cerebral infarction
I69.318	Other symptoms and signs involving cognitive functions following cerebral infarction
I69.320	Aphasia following cerebral infarction
I69.321	Dysphasia following cerebral infarction

ICD-10-CM Diagnosis Codes	Description
I69.322	Dysarthria following cerebral infarction
I69.323	Fluency disorder following cerebral infarction
I69.331	Monoplegia of upper limb following cerebral infarction affecting right dominant side
I69.332	Monoplegia of upper limb following cerebral infarction affecting left dominant side
I69.333	Monoplegia of upper limb following cerebral infarction affecting right non-dominant side
I69.334	Monoplegia of upper limb following cerebral infarction affecting left non-dominant side
I69.339	Monoplegia of upper limb following cerebral infarction affecting unspecified side
I69.341	Monoplegia of lower limb following cerebral infarction affecting right dominant side
I69.342	Monoplegia of lower limb following cerebral infarction affecting left dominant side
I69.343	Monoplegia of lower limb following cerebral infarction affecting right non-dominant side
I69.344	Monoplegia of lower limb following cerebral infarction affecting left non-dominant side
I69.349	Monoplegia of lower limb following cerebral infarction affecting unspecified side
I69.351	Hemiplegia and hemiparesis following cerebral infarction affecting right dominant side
I69.352	Hemiplegia and hemiparesis following cerebral infarction affecting left dominant side
I69.353	Hemiplegia and hemiparesis following cerebral infarction affecting right non-dominant side
I69.354	Hemiplegia and hemiparesis following cerebral infarction affecting left non-dominant side
I69.390	Apraxia following cerebral infarction
I69.391	Dysphagia following cerebral infarction
I69.392	Facial weakness following cerebral infarction
I69.393	Ataxia following cerebral infarction
I74.01	Saddle embolus of abdominal aorta
I74.09	Other arterial embolism and thrombosis of abdominal aorta
I74.10	Embolism and thrombosis of unspecified parts of aorta
I74.11	Embolism and thrombosis of thoracic aorta
I74.19	Embolism and thrombosis of other parts of aorta
I74.2	Embolism and thrombosis of arteries of the upper extremities
I74.3	Embolism and thrombosis of arteries of the lower extremities
I74.5	Embolism and thrombosis of iliac artery
I74.8	Embolism and thrombosis of other arteries
I97.810-I97.821	Other intraoperative and postprocedural complications and disorders of the circulatory system, not elsewhere classified
N28.0	Ischemia and infarction of kidney
O14.10-O14.15	Severe pre-eclampsia
O90.3	Peripartum cardiomyopathy
P28.40	Unspecified apnea of newborn
P28.41	Central neonatal apnea of newborn

ICD-10-CM Diagnosis Codes	Description
P28.43	Mixed neonatal apnea of newborn
P28.49	Other apnea of newborn
P29.0-P29.89	Cardiovascular disorders originating in the perinatal period
Q20.0-Q20.8	Congenital malformations of cardiac chambers and connections
R00.2	Palpitations
R29.5	Transient paralysis
R29.6	Repeated falls
R29.702	NIHSS score 2
R29.810	Facial weakness
R40.4	Transient alteration of awareness
R42	Dizziness and giddiness
R47.01	Aphasia
R47.02	Dysphasia
R47.1	Dysarthria and anarthria
R47.81	Slurred speech
R55	Syncope and collapse
R56.1	Post traumatic seizures
R68.13	Apparent life threatening event in infant (ALTE)
Z82.41	Family history of sudden cardiac death
Z84.82	Family history of sudden infant death syndrome
Z86.73	Personal history of transient ischemic attack (TIA), and cerebral infarction without residual deficits
Z86.74	Personal history of sudden cardiac arrest
Z87.74	Personal history of (corrected) congenital malformations of heart and circulatory system

Not Covered or Reimbursable:

ICD-10-CM Diagnosis Codes	Description
	All other codes

<u>Ambulatory Implantable Electrocardiographic Event Monitor (Implantable Loop Recorder)</u>

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

CPT®* Codes	Description
33285	Insertion, subcutaneous cardiac rhythm monitor, including programming

HCPCS Codes	Description
C1764	Event recorder, cardiac (implantable)

Cardiac Self-Monitoring

Considered Convenience Item/Not Covered or Reimbursable when used to report the use of additional software or hardware required for downloading ECG data to a device, combination devices, self-monitoring or other personal electronic device:

HCPCS Codes	Description
A9279	Monitoring feature/device, stand-alone or integrated, any type, includes all accessories, components and electronics, not otherwise classified

General Background

Cardiac arrhythmias or abnormal heartbeats represent a major source of morbidity and mortality among patients with cardiovascular disease. While some patients with arrhythmias may experience symptoms such as palpitations, weakness, dizziness, or syncope other patients may have no symptoms at all. Cardiac arrhythmias can be serious and life threatening and can lead to stroke and heart failure, including atrial fibrillation (AF), sustained ventricular tachycardia (VT), ventricular fibrillation, supraventricular tachycardia (SVT), sinus bradycardia/pauses and atrioventricular (AV) block. A history and physical examination may detect an arrhythmia and suggest possible causes. However, a diagnosis requires a 12-lead electrocardiography (ECG) or, less reliably, a rhythm strip, preferably obtained during symptoms to establish the relationship between symptoms and rhythm.

Ambulatory electrocardiographic (ECG) monitoring provides data over an extended period of time. The most common use of ambulatory electrocardiographic monitoring is for the diagnosis and assessment of cardiac arrhythmias, conduction abnormalities (symptomatic or asymptomatic) or the presence of potential arrhythmias (such as in patients with syncope or presyncope). The choice of initial ambulatory ECG monitoring for the symptomatic patient depends on the frequency and severity of symptoms. Continuous ECG (Holter) monitoring for 24 to 48 hours is used to monitor patients with daily or near daily symptoms, while those with less frequent symptoms are more likely to benefit from extended monitoring. Extended ambulatory monitoring can be performed using an external monitoring device or an insertable cardiac monitor.

Types of Ambulatory External and Implantable Electrocardiographic Monitoring devices

Device	Description	HCPCS/CPT® codes
Holter monitor **(NOT addressed in this Coverage policy)**	Around your neck with a strap so that it rests near the middle of your chest or on your belt	93224 – 93227 External electrocardiographic recording up to 48 hours by continuous rhythm recording and storage **(NOT addressed in this Coverage policy)**

Device	Description	HCPCS/CPT® codes
External Patch recorder	Does not use wires or electrodes. It continuously monitors ECG activity for 14 days using an adhesive patch that sticks to the chest. Examples: iRhythm Zio® XT SmartCardia 7L patch Wellysis S-Patch Ex	93241- 93244 External electrocardiographic recording for more than 48 hours up to 7 days by continuous rhythm recording and storage. 93245 – 93248 External electrocardiographic recording for more than 7 days up to 15 days by continuous rhythm recording and storage. 0937T-0940T External electrocardiographic recording for greater than 15 days up to 30 days by continuous rhythm recording and storage (Codes effective 01/01/2025)
External Event monitors	Event monitors: A looping memory monitor is a small device about the size of a pager that can be programmed to record your ECG for a period of time, such as 5 minutes. You must push a button to activate it, and it stores your ECG for the period before and during your symptoms. A symptom event monitor can be either a hand-held device or worn on your wrist. When you feel a symptom or irregular heartbeat, you place the monitor on your chest and activate a recording button. The back of this device has small metal discs that function as the electrodes. If the monitor is worn on a wrist, you press the button to record. This stores your ECG in memory. Unlike the looping memory monitor, these won't store your ECG before you activate it. Examples: HeartBeam AIMIGo™ System CardioComm Sirona & Trident Pro 40L (with GEMS™ platform) King of Hearts Express +AF; KOH Express AF cardiac event recorder	93268-93272 (Event Monitors) 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.

Device	Description	HCPCS/CPT® codes
Mobile Cardiac Outpatient Telemetry (MCOT)	How it's worn depends on the model; some come as a patch that can be applied firmly to chest Examples: NUVANT Mobile Cardiac Telemetry (MCT) System; KardiaMobile 6L Philips Mobile Cardiac Telemetry (MCOT) – BTPS-1000 Medtronic SEEQ Mobile Cardiac Telemetry System	93228 – 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.
Implantable loop recorder	An implantable loop recorder is implanted under the skin on the chest and can be left in place for three or more years. These devices can send your ECG by telephone to a transmission or receiving center in the hospital, medical office or monitoring company. A staff person receives your ECG and gives it to your health care professional. Examples: LINQ II™ (Medtronic) (In 2022, expanded to include use in pediatric individuals who are at least 2 years old.) Assert-IQ™ (Abbott) Reveal XT (Medtronic) SJM Confirm and Confirm Rx models Confirm Rx Insertable Cardiac Monitor (Abbott, formerly St. Jude Medical) BioMonitor2 model (Biotronik, Germany)	33285 Insertion, subcutaneous cardiac rhythm monitor, including programming (33286 – removal – NOT in this CP) C1764 Event recorder, cardiac (implantable)

Sources:

- American College of Cardiology. CardioSmart. Types of Heart Monitors. Last Edited 12/20/2021. Accessed Sept 2025. Available at URL address: https://www.cardiosmart.org/topics/heart-rhythm-problems/types-of-heart-monitors
- American Heart Association. Health topics. Arrhythmia. Prevention and Treatment of Arrhythmia. Cardiac Event Recorder. Last Reviewed: Oct 10, 2024 Accessed Sept 2025. Available at URL address: https://www.heart.org/en/health-topics/arrhythmia/prevention--treatment-of-arrhythmia/cardiac-event-recorder
- Current Procedural Terminology (CPT®) ©2024 American Medical Association: Chicago, IL.
- U.S. Food and Drug Administration (FDA). Accessed Sept 2025. Available at URL address: https://www.fda.gov/

Professional Societies/Organizations

2024 – American College of Cardiology/American Heart Association (ACC/AHA): The ACC/AHA Guideline for the Diagnosis and Management of Atrial Fibrillation (AF) (ACC/Joglar, et al., 2024) states:

4.2.2. Rhythm Monitoring Tools and Methods

- Among individuals without a known history of Atrial Fibrillation (AF), it is recommended that an initial AF diagnosis be made by a clinician using visual interpretation of the electrocardiographic signals, regardless of the type of rhythm or monitoring device (COR:1; LOE: B-NR*). (*Class of Recommendation [COR] and Level of Evidence [LOE], See Appendix)
  Supporting text: While algorithms utilizing photoplethysmography signals (derived using smartphones or smartwatches) to infer irregular heart rates can discriminate AF from normal sinus rhythm, these are not sufficiently reliable to establish an AF diagnosis.
- In patients with an intracardiac rhythm device capable of a diagnosis of AF, such as from an atrial pacemaker lead, a diagnosis of AF should only be made after it is visually confirmed by reviewing intracardiac tracings to exclude signal artifacts and other arrhythmias (COR:1; LOE: B-NR).
- 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 is reasonable (COR:2a; LOE: B-R).
  Supporting text: Randomized trials, predominately among cryptogenic stroke patients, have revealed that implantable cardiac monitors exhibit the highest sensitivity in detecting AF in view of extended monitoring periods compared with external monitors.
- 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 (COR:2a; LOE: B-NR).
  Supporting text: Although variability in accuracy across different devices may be present, the validity demonstrated in automated algorithms is generally sufficient to infer frequency, duration, and burden of AF using electrocardiographic devices such as continuously wearable monitors, implantable cardiac monitors, and cardiac rhythm devices with an atrial lead.
- Among patients with AF in whom cardiac monitoring is advised, it is reasonable to recommend use of a consumer-accessible electrocardiographic device that provides a high-quality tracing to detect recurrences (COR:2a; LOE: B-R)
  Supporting text: Cardiac monitoring may be advised to AF patients for various reasons, such as for detecting recurrences, screening, or response to therapy. Among patients with AF who are undergoing cardioversion or AF ablation, a single-center, randomized trial demonstrated that use of a self-administered handheld ECG resulted in earlier detection of recurrent AF and possibly improvement in survey-determined AF-related QOL20 compared with usual care.

6.4. Silent AF and Stroke of Undetermined Cause

- 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 (COR:2a; LOE: B-R).
  Supporting text: Growing evidence supports the use of extended cardiac monitoring for the identification of occult AF in patients with cryptogenic stroke. Additional studies are

needed, however, to determine whether extended cardiac monitoring improves long-term post-stroke outcomes.

6.8.6. Anticoagulation of Typical AFL

- Patients with typical atrial flutter (AFL) who have undergone successful cavotricuspid isthmus (CTI) ablation and are deemed to be at high thromboembolic risk, without any known previous history of AF, should receive close follow-up and arrhythmia monitoring to detect silent AF if they are not receiving ongoing anticoagulation in view of significant risk of AF (COR**:**1; LOE: B-NR).
  Supporting text: Intermittent monitoring may be performed with ambulatory monitors or wearable devices. Alternatively, implantable devices can provide more prolonged and continuous monitoring. Implantable cardiac monitors have been used in multiple settings to detect AF, including after AF ablation or in patients with cryptogenic stroke.

9.2. Management of AF in Patients With HF

- In patients with AF-induced cardiomyopathy who have recovered left ventricular (LV) function, long-term surveillance can be beneficial to detect recurrent AF in view of the high risk of recurrence of arrhythmia-induced cardiomyopathy (COR:2a; LOE: B-NR).
  Supporting text: Long-term surveillance to detect recurrent AF can be beneficial and can be accomplished by various modalities, including wearable devices, smart watches, random monitoring (Holter, event, mobile telemetry), and implantable loop recorders.

10.1. Management of Early Onset AF, Including Genetic Testing

- In patients with an onset of AF before 45 years of age without obvious risk factors for AF, referral for genetic counseling, genetic testing for rare pathogenic variants, and surveillance for cardiomyopathy or arrhythmia syndromes may be reasonable (COR:2b; LOE: B-NR).

10.10. Acute Medical Illness or Surgery (Including AF in Critical Care)

- In patients with AF who are identified in the setting of acute medical illness or surgery, outpatient follow-up for thromboembolic risk stratification and decision-making on oral anticoagulant (OAC) initiation or continuation, as well as AF surveillance, can be beneficial given a high risk of AF recurrence (COR:2a; LOE: B-NR).
  Supporting text: AF identified in the setting of hospitalization for acute noncardiac illness (acute AF), including patients who are critically ill, may represent new-onset AF that has been detected and treated for the first time. Close outpatient follow-up with consideration of heart rhythm monitoring and thromboembolic risk stratification is important considering the high risk of AF recurrence in these patients, especially in those who underwent noncardiac surgery and with risk factors for stroke in whom the AF is likely to recur. The optimal frequency, duration, and type of rhythm monitoring for patients with acute AF remain unclear and need further study.

Future Research Needs

- #9 - Use and applicability of consumer-based wearable heart monitoring devices: Validation on the accuracy of the most common available technologies is needed. How to best use these devices in practice, including for AF screening, must be better defined (Class of Recommendation [COR] and Level of Evidence [LOE]; See Appendix) (ACC/Joglar, et al., 2024).

2024 – American College of Cardiology/American Heart Association (ACC/AHA): The ACC/AHA 2024 Guideline for the Management of Hypertrophic Cardiomyopathy (HCM) was developed in collaboration with and endorsed by the American Medical Society for Sports

Medicine, the Heart Rhythm Society, Pediatric & Congenital Electrophysiology Society, and the Society for Cardiovascular Magnetic Resonance.

6.5. Heart Rhythm Assessment

- In patients with HCM, 24- to 48-hour ambulatory electrocardiographic monitoring is recommended in the initial evaluation and as part of periodic follow-up (every 1-2 years) to identify patients who are at risk for SCD and to guide management of arrhythmias (COR:1; LOE: B-NR, See Appendix).
- In patients with HCM who develop palpitations or lightheadedness, extended (>24 hours) electrocardiographic monitoring or event recording is recommended for arrhythmia diagnosis and clinical correlation (COR:1; LOE: B-NR).
- In patients with HCM who are deemed to be at high risk for developing AF based on the presence of risk factors or as determined by a validated risk score, and who are eligible for anticoagulation, extended ambulatory monitoring is recommended to screen for AF as part of initial evaluation and annual follow-up (COR:1; LOE: B-NR).
- In adult patients with HCM without risk factors for AF and who are eligible for anticoagulation, extended ambulatory monitoring may be considered to assess for asymptomatic paroxysmal AF as part of initial evaluation and periodic follow-up (every 1-2 years) (COR:2b; LOE: B-NR).

6.9 Individuals Who Are Genotype-Positive, Phenotype-Negative

In the narrative background, the ACC discusses the following: Because of the low risk of sudden death, phenotype-negative individuals are not restricted from competitive sports and are not routinely monitored with ambulatory electrocardiography and exercise stress testing unless the family history indicates a high risk for sudden cardiac death (SCD) or as part of precompetitive athletic screening.

7.1.1. Sudden Cardiac Death (SCD) Risk Assessment in Adults With HCM

- In adult patients with HCM, a comprehensive, systematic noninvasive SCD risk assessment at initial evaluation and every 1 to 2 years thereafter is recommended and should include evaluation of these risk factors:
  - Personal history of cardiac arrest or sustained ventricular arrhythmias;
  - Personal history of syncope suspected by clinical history to be arrhythmic;
  - Family history in close relative of premature HCM-related sudden death, cardiac arrest, or sustained ventricular arrhythmias;
  - Maximal LV wall thickness, EF, LV apical aneurysm;
  - NSVT episodes on continuous ambulatory electrocardiographic monitoring (COR:1; LOE: B-NR).
- For adult patients with HCM who are not otherwise identified as high risk for SCD, or in whom a decision to proceed with implantable cardioverter-defibrillator (ICD) placement remains uncertain after clinical assessment that includes personal/family history, echocardiography, and ambulatory electrocardiographic monitoring, CMR imaging is beneficial to assess for maximum LV wall thickness, EF, LV apical aneurysm, and extent of myocardial fibrosis with late gadolinium enhancement (COR:1; LOE: B-NR).

7.1.2. SCD Risk Assessment in Children and Adolescents With HCM

- For children and adolescents with HCM, a comprehensive, systematic noninvasive SCD risk assessment at initial evaluation and every 1 to 2 years thereafter is recommended and should include evaluation of these risk factors:
  - Personal history of cardiac arrest or sustained ventricular arrhythmias;
  - Personal history of syncope suspected by clinical history to be arrhythmic;

- Family history in close relative of premature HCM-related sudden death, cardiac arrest, or sustained ventricular arrhythmias;
- Maximal LV wall thickness, EF, LV apical aneurysm;
- NSVT episodes on continuous ambulatory electrocardiographic monitoring (COR:1; LOE: B-NR).

- For children and adolescents with HCM who have a borderline risk for SCD, or in whom a decision to proceed with ICD placement remains uncertain after clinical assessment that includes personal and family history, echocardiography, and ambulatory electrocardiographic monitoring, CMR imaging is beneficial to assess for extent of myocardial fibrosis with late gadolinium enhancement (COR:1; LOE: C-LD) (ACC/AHA 2024),

2024 – European Heart Rhythm Association/Heart Rhythm Society (EHRA/HRS): The 2024 European Heart Rhythm Association/Heart Rhythm Society (Tzeis, et al., 2024) Expert Consensus Statement on Catheter and Surgical Ablation of Atrial Fibrillation indicates:

9.4.3. Practical considerations on postablation rhythm monitoring
The suggested pattern and intensity of postablation rhythm monitoring should be tailored based on whether patient management is part of routine clinical care or part of a clinical research trial.

- As part of routine clinical care, rhythm status should be assessed during regular follow-up within 2–3 months after ablation with a minimum standard of a 12-lead ECG. In the absence of symptoms, all patients should be evaluated on an annual basis thereafter with a 12-lead ECG in every follow-up visit. In case of arrhythmia symptoms, some type of intermittent rhythm monitoring is suggested. Intensity and type of monitoring should be individualized based on symptom severity, frequency, availability of monitoring tools, associated cost, and patient preferences.
- In the clinical trial setting and in the absence of invasive monitoring, a minimum of 24-hour continuous Holter type monitor should be considered every 3 months for the first year following catheter ablation, preferably in combination with symptom-based monitoring. Where available, longer duration recordings with 7-day or 14-day continuous monitoring are preferable (Tzeis, et al., 2024).

2024 – Heart Rhythm Society (HRS): The HRS Expert Consensus Statement on Arrhythmias in the Athlete (Lampert, et al., 2024) indicates:

5.1.3 Recommendations for diagnostic and monitoring strategies for syncope in athletes

6. In athletes with unexplained syncope or when arrhythmic syncope is suspected, ambulatory ECG monitoring is beneficial (COR:1; LOE: B-R).
7. In athletes with a high suspicion of arrhythmic etiology, unexplained after initial testing, and/or whose symptoms are rare, loop recorder implantation can be useful (COR:2a; LOE: B-NR).

6.1 Recommendations for the evaluation of ventricular arrhythmias in athletes

1. In athletes with symptoms suspicious for ventricular arrhythmias, a resting 12-lead ECG and ambulatory ECG monitor are recommended to assess ventricular arrhythmia burden and complexity (COR:1; LOE: B-NR).
4. In athletes with 2 or more asymptomatic typical PVCs, or 1 atypical PVC, on a 12-lead ECG, further evaluation with ambulatory monitoring and cardiac imaging is recommended (COR:1; LOE: C-LD).

6.2.1. Recommendations for treatment of benign ventricular arrhythmias in the athlete

3. In the asymptomatic athlete with a high burden of benign PVCs (> 10% burden) in the absence of structural heart disease, active monitoring for PVC-induced cardiomyopathy with serial imaging and ambulatory monitoring is recommended (COR:1; LOE: C-LD).

8.2 Recommendations for the atrial fibrillation evaluation in athletes

4. In athletes with AF, rhythm monitoring can be useful to evaluate burden, rate of ventricular response during an episode, relationship to symptoms, and documentation of other arrhythmias (COR:2a; LOE: C-LD) (Lampert, et al., 2024).

2023 – Heart Rhythm Society (HRS): The HRS Expert Consensus Statement on the Management of Arrhythmias during Pregnancy (Joglar, et al., 2023) indicates:

Section 5: Recommendations for the diagnosis of pregnant patients with palpitations

2. Pregnant patients with suspected arrhythmic etiology of unexplained palpitations who have concerning symptoms or suspected electrical or structural heart disease (SHD) on initial evaluation should undergo ambulatory monitoring as clinically indicated, in consultation with a cardiologist or electrophysiologist with expertise in cardiovascular diseases in pregnancy (COR:1; LOE: B-NR).
4. In pregnant patients with suspected arrhythmic etiology of palpitations unexplained after noninvasive cardiac evaluation, especially in the presence of syncope and/or electrical or SHD, consideration of an implantable cardiac monitor (ICM) is reasonable (COR:2a; LOE C-LD).

6.1 Recommendations for the diagnosis and approach to the pregnant patient with syncope

2. Pregnant patients with new onset of unexplained syncope, especially if it occurs in the first trimester or recurs during pregnancy, are at higher risk of adverse pregnancy outcomes and should receive enhanced evaluation, including echocardiogram, followed by close periodic monitoring (COR:1; LOE: B-NR).
4. In pregnant patients with recurrent syncope unexplained after comprehensive noninvasive evaluation, including external monitor, insertion of an ICM is recommended (COR:1; LOE: C-LD) (Joglar, et al., 2023).

2022 – U.S. Preventive Services Task Force (USPSTF): According to an USPSTF recommendation statement on screening for atrial fibrillation, there is a lack of evidence to assess the balance of benefits and harms of screening for AF. As such, the USPSTF cannot recommend screening for AF in asymptomatic adults (USPSTF, et al., 2022).

2021– American Heart Association/Heart Rhythm Society (AHA/HRS): The 2021 AHA/HRS guideline for the prevention of stroke in patients with stroke and transient ischemic attack stated defined cryptogenic stroke as an imaging-confirmed stroke without a known source even with a full diagnostic assessment (including, at a minimum, arterial imaging, echocardiography, extended rhythm monitoring, and key laboratory studies such as a lipid profile and hemoglobin A1c [HbA1c]). Patients with a cryptogenic stroke who can take anticoagulation, long-term cardiac monitoring with mobile cardiac outpatient telemetry, implantable loop recorder, or other approach is reasonable to detect intermittent AF (Kleindorfer, et al., 2021).

2021 – HRS/ACC/AHA: The 2021 PACES Expert Consensus Statement on the Indications and Management of Cardiovascular Implantable Electronic Devices in Pediatric Patients (defined as ≤21 years of age) (Shah, et al., 2021; Pediatric and Congenital Electrophysiology Society [PACES]) states the following specific to Insertable Cardiac Monitors (ICM):

- Noninvasive cardiac rhythm monitoring is indicated in all patients prior to placement of an ICM. (COR:1; LOE: B-NR*). (*Class of Recommendation [COR] and Level of Evidence [LOE], See Appendix)
- ICM is indicated in syncopal patients with high-risk criteria when comprehensive evaluation does not define a cause of syncope or lead to a specific treatment, and who do not have conventional indications for a pacemaker or ICD (COR:1; LOE: B-NR).
- ICM is reasonable in the evaluation of patients with recurrent syncope of uncertain origin but not a high risk of SCD (COR:2a; LOE: B-NR).
- ICM is reasonable in patients with infrequent symptoms (>30-day intervals) suspected to be due to an arrhythmia, when the initial noninvasive evaluation is nondiagnostic (COR:2a; LOE:C-LD).
- ICM implantation is reasonable for guiding the management of patients with cardiac channelopathies or structural heart diseases associated with significant rhythm abnormalities (COR:2a; LOE: C-LD).
- ICM may be considered in patients with suspected reflex syncope presenting with frequent or severe syncopal episodes (COR:2b; LOE: C-LD).
- ICM may be considered in carefully selected patients with suspected epilepsy in whom anticonvulsive treatment has proven ineffective (COR:2b; LOE: C-LD).
- ICM may be considered in patients with severe but infrequent palpitations when other monitoring methods have failed to document an underlying cause (COR:2b; LOE: C-LD).
- ICM implantation may be considered for detecting subclinical arrhythmias in patients with cardiac channelopathies or other diseases associated with significant rhythm abnormalities (COR:2b; LOE: C-EO).

2020 – Heart Rhythm Society (HRS): The HRS expert consensus statement on the diagnosis and treatment of postural tachycardia syndrome, inappropriate sinus tachycardia, and vasovagal syncope stated that implantable loop recorders (ILRs) can be useful for assessing recurrent and troublesome syncope in older patients who lack a clear diagnosis and are at low risk of a fatal outcome (Sheldon, et al., 2015; Reaffirmed 2020).

2018 – ACC/AHA/HRS: The ACC/AHA/HRS guidelines on the evaluation and management of patients with bradycardia and cardiac conduction delay stated that because of the prolonged monitoring duration, external loop recorders, transtelephonic event recorders, adhesive patch recorders, and mobile continuous outpatient telemetry monitoring provide a higher diagnostic yield than 24- or 48-hour Holter monitoring. These extended monitoring strategies can be useful in the evaluation of suspected bradycardia or conduction disorders.
The guidelines recommended that implantation of a cardiac monitor is reasonable if the initial noninvasive evaluation is non-diagnostic with infrequent symptoms (> 30 days between symptoms) and suspected to be caused by bradycardia (Kusumoto, et al., 2018).

2017 – ACC/AHA/HRS: The ACC/AHA/HRS 2017 guideline for the evaluation and management of patients with syncope (Shen, et al., 2017) stated that there are several types of ambulatory cardiac rhythm monitoring devices. The selection and usefulness are highly dependent on the frequency of syncope and the likelihood of an arrhythmic cause of syncope.

A patch recorder can be considered as an alternative to an external loop recorder in select ambulatory patients with syncope of suspected arrhythmic etiology. The guideline also stated that

the patch is less cumbersome than an external loop recorder. Patient-activated, transtelephonic monitor (event monitor) can be used when there are frequent, spontaneous symptoms that are likely to recur within 2–6 weeks. There is limited use in patients with frank syncope associated with sudden incapacitation. An external loop recorder (patient or auto triggered) is selected when there is frequent, spontaneous symptoms related to syncope, which are likely to recur within 2–6 weeks. Mobile cardiac outpatient telemetry (MCOT) is used when there are spontaneous symptoms related to syncope and rhythm correlation. High-risk patients whose rhythm requires real-time monitoring can benefit from MCOT.

The guideline stated that implantable cardiac monitoring can be useful when evaluating select ambulatory patients with syncope of suspected arrhythmic etiology following a non-diagnostic initial workup (e.g., history & physical, 12 lead ECG). Further testing is recommended when the initial evaluation is unclear (e.g., orthostatic hypertension, tilt table testing)

The ACC states that in a prospective study of 60 patients with syncope of unknown origin, the diagnosis (primarily bradyarrhythmia) was made in 55% with ICM, compared with a 19% diagnostic yield with conventional testing (external loop recorder for a 2- to 4-week period, followed by tilt-table testing and electrophysiological study [EPS]) (p=0.0014) (Krahn, et al., 2001). These findings are consistent with other studies, which generally have shown that patients who underwent the ICM approach experienced higher rates of diagnosis than those of patients who underwent the conventional approach (ACC/Shen, et al., 2017).

Literature Review – Other Indications
Ambulatory external and internal monitoring has been proposed for the treatment of multiple other disorders including but not limited to routine monitoring of documented arrhythmias, screening asymptomatic patients or assessing the effectiveness of treatment, and detecting arrhythmias after myocardial infarction in asymptomatic patients. Overall, improved health outcomes following cardiac monitoring for the treatment of these conditions have not been established (Kwun, et al., 2022; Singh, et al., 2022; Ha, et al., 2021; Svendsen, et al., 2021; Nasir, et al., 2017; Reiffel, et al., 2017; Ciconte, et al., 2017; Solbiati, et al., 2016).

Wijesurendra et al. (2025) investigated the long-term efficacy of AF screening in older individuals at moderate to high risk of stroke using 14-day, patch-based continuous ambulatory electrocardiogram (ECG) monitoring.

- A total of 5040 participants were randomized to receive and return an ECG patch monitor by postal mail (intervention, n = 2520) or usual care (control, n = 2520). individuals were 65 years or older with a CHA2DS2VASc score of 3 or higher (men) or 4 or higher (women) with no previous AF or atrial flutter. They were identified via automated electronic health record searches in the UK.
- The primary outcome was the proportion of participants with the presence of AF in primary care records within 2.5 years post-randomization, which was analyzed using an intention-to-treat approach.
- A total of 2126 participants (84.4%) wore and returned the patch. AF was detected by patch in 89 participants (4.2%), 55% of whom had an AF burden less than 10%. After 2.5 years, a post-randomization record of AF was present in 172 individuals (6.8%) in the intervention group vs 136 (5.4%) in the control group (P = .03), with consistent results in prespecified subgroups. Mean exposure to oral anticoagulation by 2.5 years was 1.63 months in the intervention group and 1.14 months in the control group (P < .001). Stroke occurred in 69 participants (2.7%) in the intervention group and 64 (2.5%) in the control group.
- The authors concluded that AF screening in this setting may have limited impact on stroke events at 2.5 years.

Cardiac Self-Monitoring
Ambulatory detection of atrial fibrillation has become an area of focus in the cardiovascular application of mobile health technology. Commercially available examples of ECG-based wearables include Apple Watch (Apple), mobile ECG devices, and temporary patches (e.g,, Zio patch; iRhythm Technologies). KardiaMobile 6L (AliveCor) pairs smartphones with a mobile ECG monitor for arrhythmia surveillance. It was FDA-approved June 2021 and is intended to record, store and transfer one- and two-channel ECG rhythms. It is intended for use "by healthcare professionals, patients with known or suspected heart conditions and health-conscious individuals". The device has not been tested and is not intended for pediatric use. KardiaMobile six-lead device has two electrodes on the top of the device, there is one additional electrode on the bottom. The user places their thumbs on each of the two top electrodes and places the bottom electrode on their left knee or ankle.

Cardiac Self-Monitoring – Professional Societies/Organizations: The 2024 American College of Cardiology/American Heart Association (ACC/AHA) Guideline for the Diagnosis and Management of Atrial Fibrillation (AF) (ACC/Joglar, et al., 2024)

- Future Research Needs (#9) states their use and applicability 'must be better defined'.

- 4.2.2 (#1) Supporting text states 'While algorithms utilizing photoplethysmography signals (derived using smartphones or smartwatches) to infer irregular heart rates can discriminate AF from normal sinus rhythm, these are not sufficiently reliable to establish an AF diagnosis'.

- 4.2.2 (#5) states 'Among patients with AF in whom cardiac monitoring is advised, it is reasonable to recommend use of a consumer-accessible electrocardiographic device that provides a high-quality tracing to detect recurrences (COR:2a; LOE: B-R)'. Supporting text: Cardiac monitoring may be advised to AF patients for various reasons, such as for detecting recurrences, screening, or response to therapy. Among patients with AF who are undergoing cardioversion or AF ablation, a single-center, randomized trial demonstrated that use of a self-administered handheld ECG resulted in earlier detection of recurrent AF and possibly improvement in survey-determined AF-related QOL20 compared with usual care.

Cardiac Self-Monitoring – Literature Review: Studies have determined a range of sensitivity and specificity values of various devices in diagnosing atrial fibrillation in various populations. Further studies should examine whether utilization of these methods and devices could improve clinical outcomes and in what target populations. Uncertainty remains about the benefits of diagnosing and treating asymptomatic atrial fibrillation, particularly in persons whose episodes of atrial fibrillation are of 6 hours' duration or less (Manetas-Stavrakakis, et al., 2023; Ding, et al., 2023; Guo, et al., 2022; Koh, et al., 2021; Dagher, et al., 2020; Perez, et al., 2019; Reed, et al., 2019; William, et al., 2018). Trials in progress include:

- Smartwatch and External Holter Monitoring to Detect Atrial Fibrillation in Patients With Cryptogenic Stroke. The SMARTTHUNDER trial is investigating the use of commercially available smartwatches for detecting atrial fibrillation (AF) in patients who have recently had a cryptogenic (undetermined origin) stroke (NCT05565781).
- The Rhythm Evaluation for AntiCoagulaTion (REACT-AF) trial a multicenter prospective, randomized, open-label, blinded endpoint (PROBE design), controlled trial comparing the current Standard Of Care (SOC) of continuous Direct Oral Anticoagulation (DOAC) use versus time-delimited (1 month) DOAC guided by an AF-sensing Smart Watch (AFSW) in

participants with a history of paroxysmal or persistent Atrial Fibrillation (AF) and low-to-moderate stroke risk. A collaboration between Northwestern Medicine and the American Heart Association, the study is funded by a multi-million-dollar grant awarded to Northwestern University and Johns Hopkins University from the National Heart, Lung, and Blood Institute (NCT05836987).

Health Equity Considerations

Health equity is the highest level of health for all people; health inequity is the avoidable difference in health status or distribution of health resources due to the social conditions in which people are born, grow, live, work, and age.

Social determinants of health are the conditions in the environment that affect a wide range of health, functioning, and quality of life outcomes and risks. Examples include safe housing, transportation, and neighborhoods; racism, discrimination and violence; education, job opportunities and income; access to nutritious foods and physical activity opportunities; access to clean air and water; and language and literacy skills.

Medicare Coverage Determinations

	Contractor	Determination Name/Number	Revision Effective Date
NCD	National	Electrocardiographic Services (20.15)	8/26/2004
LCD	CGS Administrators, LLC	Cardiac Event Detection (L33952)	11/25/2021
LCD	First Coast Service Options, Inc.	Long-Term Wearable Electrocardiographic Monitoring (WEM) (L33380)	10/01/2019
LCD	Palmetto GBA	Cardiac Event Detection (L34573)	10/10/2019

Note: Please review the current Medicare Policy for the most up-to-date information.
(NCD = National Coverage Determination; LCD = Local Coverage Determination)

Appendix

The Class (Strength) of Recommendation (COR) indicates the strength of recommendation, encompassing the estimated magnitude and certainty of benefit in proportion to risk.

Class I – Strong (is recommended)
Class 2a – Moderate (is reasonable)
Class 2b – Weak (may/might be reasonable)
Class 3 – No benefit (Moderate) (is not recommended)
Class 3 – Harm (Strong) (potentially harmful)

The Level (Quality) of Evidence (LOE) rates the quality of scientific evidence supporting the intervention on the basis of the type, quantity, and consistency of data from clinical trials and other sources.

Level A – High quality evidence from more than one randomized clinical trial, Meta-analyses of high-quality randomized clinical trials, One or more randomized clinical trials corroborated by high-quality registry.

Level B-R – Randomized. Moderate quality evidence from one or more randomized clinical trials, Meta-analyses of moderate-quality randomized clinical trials.
Level B-NR – Non-randomized. Moderate quality evidence from one or more well-designed, well-executed nonrandomized studies, observational studies, or registry studies, Meta-analyses of such studies.
Level C-LD – Limited data. Randomized or nonrandomized observational or registry studies with limitations of design or execution, Meta-analyses of such studies, Physiological or mechanistic studies of human subjects.
Level C-EO – Expert Opinion. Consensus expert opinion based on the clinical experience

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Revision Details

Type of Revision	Summary of Changes	Date
Annual Review	• Added policy statement for hypertrophic cardiomyopathy	11/15/2025
Focused Review	• Revised policy statement for implantable electrocardiographic event monitor	5/15/2025
Annual Review	• Revised policy statement for implantable electrocardiographic event monitor	11/15/2024
Focused Review	• Revised policy statement for implantable electrocardiographic event monitor	7/15/2024
Focused Review	• Revised policy statements in the setting of acute medical illness or surgery	5/15/2024
Annual Review	• Added policy statement for implantable cardiac event monitoring in pediatric individuals • Revised policy statements for: ➢ ambulatory external cardiac monitoring ➢ mobile cardiac monitoring with telemetry ➢ implantable cardiac event monitoring in adults	3/15/2024