Medical Coverage Policy

Effective Date.....7/15/2024
Next Review Date.....11/15/2024
Coverage Policy Number..... 0547

Ambulatory External and Implantable Electrocardiographic Monitoring

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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, 93271, 93272) 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 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 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, E0616) 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 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 not covered or reimbursable.

* 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, E0616) 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 covered or reimbursable:

- 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 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

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.

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)**
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: Zio® XT SmartCardia 7L patch	93241- 93244 External electrocardiographic recording <u>for more than 48 hours up to 7 days</u> by continuous rhythm recording and storage. 93245 – 93248 External electrocardiographic recording for more than <u>7 days up to 15 days</u> by continuous rhythm recording and storage.
External Event monitors	Event monitors: A looping memory monitor is a small device about the size of a	93268-93272 (Event Monitors) External patient and, when performed, auto activated electrocardiographic

Device	Description	HCPCS/CPT® codes
	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. Example: King of Hearts Express +AF; KOH Express AF cardiac event recorder	rhythm derived event recording with symptom-related memory loop with remote download capability up to 30 days, 24-hour attended monitoring.
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 Example: NUVANT Mobile Cardiac Telemetry (MCT) System; KardiaMobile 6L	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)	33285 Insertion, subcutaneous cardiac rhythm monitor, including programming (33286 – removal – NOT in this CP) C1764 Event recorder, cardiac (implantable) E0616 Implantable cardiac event recorder with memory, activator, and programmer 0650T Programming device evaluation (remote) of subcutaneous cardiac

Device	Description	HCPCS/CPT® codes
	(In 2022, expanded to include use in pediatric individuals who are at least 2 years old.) Assert-IQ™ (Abbott)	rhythm monitor system, with iterative adjustment of the implantable device to test the function of the device and select optimal permanently programmed values with analysis, review and report by a physician or other qualified health care professional.

Sources:

- American College of Cardiology. CardioSmart. Types of Heart Monitors. Last Edited 12/20/202. Accessed Jan 2024. 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: Nov 28, 2022 Accessed Jan 2024. Available at URL address: https://www.heart.org/en/health-topics/arrhythmia/prevention--treatment-of-arrhythmia/cardiac-event-recorder
- Current Procedural Terminology (CPT®) ©2022 American Medical Association: Chicago, IL.
- U.S. Food and Drug Administration (FDA). Accessed Jan 2024. 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:

<u>4.2.2. Rhythm Monitoring Tools and Methods</u>

- 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 <u>systemic thromboembolic</u> event without a known history of AF and in whom maximum sensitivity to detect AF is sought, <u>an implantable cardiac monitor is reasonable</u> (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).

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 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) (Shen, et al., 2017).

2017 – Heart Rhythm Society/European Heart Rhythm Association/European Cardiac Arrhythmia Society/ Asia Pacific Heart Rhythm Society/Latin American Society of Cardiac Stimulation and Electrophysiology (HRS/EHRA/ECAS/APHRS/SOLAECE): The 2017 HRS/EHRA/ECAS/APHRS/SOLAECE expert consensus statement on catheter and surgical ablation of atrial fibrillation recommended that arrhythmia monitoring for efficacy of catheter

ablation is typically delayed for at least three months postablation unless required to evaluate arrhythmia symptoms during the early postablation period. The two main reasons to perform arrhythmia monitoring following catheter ablation are clinical care and as part of a clinical research trial.
Additionally, the consensus statement recommended that adherence to atrial fibrillation anticoagulation guidelines is recommended for patients who have undergone an AF ablation procedure, regardless of outcome of the procedure. If anticoagulation is needed for more than two months post ablation, the patient's stroke risk profile should be used and not the perceived success or failure of the ablation procedure (Calkins, 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).

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). Recruiting trials include 'Smartwatch and External Holter Monitoring to Detect Atrial Fibrillation in Patients With Cryptogenic Stroke' (SMARTTHUNDER, NCT05565781).

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

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

CPT®* Codes	Description
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

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
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
G45.0	Vertebro-basilar artery syndrome
G45.2	Multiple and bilateral precerebral artery syndromes

ICD-10-CM Diagnosis Codes	Description
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
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
I47.1	Supraventricular tachycardia (Code invalid 09/30/2023)
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

ICD-10-CM Diagnosis Codes	Description
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
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

ICD-10-CM Diagnosis Codes	Description
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
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

ICD-10-CM Diagnosis Codes	Description
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
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

ICD-10-CM Diagnosis Codes	Description
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

Mobile Cardiac Monitoring with Telemetry

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 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
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
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

ICD-10-CM Diagnosis Codes	Description
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
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
I47.1	Supraventricular tachycardia (Code invalid 09/30/2023)
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

ICD-10-CM Diagnosis Codes	Description
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
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

ICD-10-CM Diagnosis Codes	Description
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
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

ICD-10-CM Diagnosis Codes	Description
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
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

ICD-10-CM Diagnosis Codes	Description
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
0650T	Programming device evaluation (remote) of subcutaneous cardiac rhythm monitor system, with iterative adjustment of the implantable device to test the function of the device and select optimal permanently programmed values with analysis, review and report by a physician or other qualified health care professional

HCPCS Codes	Description
C1764	Event recorder, cardiac (implantable)
E0616	Implantable cardiac event recorder with memory, activator and programmer

<u>Cardiac Self-Monitoring</u>

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

***Current Procedural Terminology (CPT®) ©2023 American Medical Association: Chicago, IL.**

References

1. American College of Cardiology. CardioSmart. Types of Heart Monitors. Last Edited 12/20/2021. Accessed Jan 2024. Available at URL address: https://www.cardiosmart.org/topics/heart-rhythm-problems/types-of-heart-monitors

2. American Heart Association. Health topics. Arrhythmia. Prevention and Treatment of Arrhythmia. Cardiac Event Recorder. Last Reviewed: Nov 28, 2022. Accessed Jan 2024. Available at URL address: https://www.heart.org/en/health-topics/arrhythmia/prevention--treatment-of-arrhythmia/cardiac-event-recorder

3. Bernstein RA, Kamel H, Granger CB, Piccini JP, Sethi PP, Katz JM, Vives CA, Ziegler PD, Franco NC, Schwamm LH; STROKE-AF Investigators. Effect of Long-term Continuous Cardiac Monitoring vs Usual Care on Detection of Atrial Fibrillation in Patients With Stroke Attributed to Large- or Small-Vessel Disease: The STROKE-AF Randomized Clinical Trial. JAMA. 2021 Jun 1;325(21):2169-2177.

4. Bettin M, Dechering D, Kochhäuser S, Bode N, Eckardt L, Frommeyer G, Reinke F. Extended ECG monitoring with an implantable loop recorder in patients with cryptogenic stroke: time schedule, reasons for explantation and incidental findings (results from the TRACK-AF trial). Clin Res Cardiol. 2019 Mar;108(3):309-314.

5. Buck BH, Hill MD, Quinn FR, Butcher KS, Menon BK, Gulamhusein S, Siddiqui M, Coutts SB, Jeerakathil T, Smith EE, Khan K, Barber PA, Jickling G, Reyes L, Save S, Fairall P, Piquette L, Kamal N, Chew DS, Demchuk AM, Shuaib A, Exner DV. Effect of Implantable vs Prolonged External Electrocardiographic Monitoring on Atrial Fibrillation Detection in Patients With Ischemic Stroke: The PER DIEM Randomized Clinical Trial. JAMA. 2021 Jun 1;325(21):2160-2168.

6. Caceres BA, Hickey KT, Bakken SB, Biviano AB, Garan H, Goldenthal IL, et al. Mobile Electrocardiogram Monitoring and Health-Related Quality of Life in Patients With Atrial Fibrillation: Findings From the iPhone Helping Evaluate Atrial Fibrillation Rhythm Through Technology (iHEART) Study. J Cardiovasc Nurs. 2020 Jul/Aug;35(4):327-336.

7. Calkins H, Hindricks G, Cappato R, Kim YH, Saad EB, Aguinaga L, et al. 2017 HRS/EHRA/ECAS/APHRS/SOLAECE expert consensus statement on catheter and surgical ablation of atrial fibrillation. Heart Rhythm. 2017 Oct;14(10):e275-e444.

8. Centers for Medicare and Medicaid Services (CMS). Local Coverage Determinations (LCDs) alphabetical index. Accessed Jan 2024. Available at URL address: https://www.cms.gov/medicare-coverage-database/indexes/lcd-alphabetical-index.aspx?Cntrctr=373&ContrVer=1&CntrctrSelected=373*1&DocType=Active%7cFuture&s=All&bc=AggAAAQAAAAA&

9. Centers for Medicare and Medicaid Services (CMS). National Coverage Determinations (NCDs) alphabetical index. Accessed Jan 2024. Available at URL address: https://www.cms.gov/medicare-coverage-database/indexes/ncd-alphabetical-index.aspx

10. Ciconte G, Giacopelli D, Pappone C. The Role of Implantable Cardiac Monitors in Atrial Fibrillation Management. J Atr Fibrillation. 2017 Aug 31;10(2):1590.

11. Clinicaltrials.gov. Smartwatch and External Holter Monitoring to Detect Atrial Fibrillation in Patients With Cryptogenic Stroke (SMARTTHUNDER). ClinicalTrials.gov Identifier: NCT05565781. Recruiting. Accessed Jan 2024. Available at URL address: https://classic.clinicaltrials.gov/ct2/show/NCT05565781

12. Conti S, Reiffel JA, Gersh BJ, Kowey PR, Wachter R, Halperin JL, et al. Baseline Demographics, Safety, and Patient Acceptance of an Insertable Cardiac Monitor for Atrial Fibrillation Screening: The REVEAL-AF Study. J Atr Fibrillation. 2017 Feb 28;9(5):1551.

13. Da Costa A, Defaye P, Romeyer-Bouchard C, Roche F, Dauphinot V, Deharo JC, et al. Clinical impact of the implantable loop recorder in patients with isolated syncope, bundle branch block and negative workup: a randomized multicentre prospective study. Arch Cardiovasc Dis. 2013 Mar;106(3):146-54.

14. Dagher L, Shi H, Zhao Y, Marrouche NF. Wearables in cardiology: Here to stay. Heart Rhythm. 2020 May;17(5 Pt B):889-895.

15. Dickson EL, Ding EY, Saczynski JS, Han D, Moonis M, Fitzgibbons TP, Barton B, Chon K, McManus DD. Smartwatch monitoring for atrial fibrillation after stroke-The Pulsewatch Study: Protocol for a multiphase randomized controlled trial. Cardiovasc Digit Health J. 2021 Jul 13;2(4):231-241. doi: 10.1016/j.cvdhj.2021.07.002. Erratum in: Cardiovasc Digit Health J. 2021 Sep 17;2(5):291. PMID: 35265913; PMCID: PMC8890084. Pulsewatch (NCT03761394) study

16. Ding EY, Tran KV, Lessard D, Wang Z, Han D, Mohagheghian F, et al. Accuracy, Usability, and Adherence of Smartwatches for Atrial Fibrillation Detection in Older Adults After Stroke: Randomized Controlled Trial. JMIR Cardio. 2023 Nov 28;7:e45137.

17. Eysenck W, Freemantle N, Sulke N. A Randomized Trial Evaluating the Accuracy of AF Detection by Four External Ambulatory ECG Monitors Compared to Permanent Pacemaker AF Detection J Interv Card Electrophysiol. Apr 2020; 57(3): 361-369.

18. Gladstone DJ, Dorian P, Spring M, Panzov V, Mamdani M, Healey JS, et al. Atrial premature beats predict atrial fibrillation in cryptogenic stroke: results from the EMBRACE trial. Stroke. 2015; 46(4):936-941.

19. Gladstone DJ, Spring M, Dorian P, Panzov V, Thorpe KE, Hall J, Vaid H, et al. Atrial fibrillation in patients with cryptogenic stroke. N Engl J Med. 2014 Jun 26;370(26):2467-77.(EMBRACE)

20. Guo Y, Zhang H, Lip GYH; mAF-App II Trial investigators. Consumer-Led Screening for Atrial Fibrillation: A Report From the mAFA-II Trial Long-Term Extension Cohort. JACC Asia. 2022 Nov 1;2(6):737-746.

21. Ha ACT, Verma S, Mazer CD, Quan A, Yanagawa B, Latter DA, et al. Effect of Continuous Electrocardiogram Monitoring on Detection of Undiagnosed Atrial Fibrillation After Hospitalization for Cardiac Surgery: A Randomized Clinical Trial. JAMA Netw Open. 2021 Aug 2;4(8):e2121867.

22. Joglar JA, Chung MK, Armbruster AL, Benjamin EJ, Chyou JY, et al. 2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation. 2024 Jan 2;149(1):e1-e156. doi: 10.1161/CIR.0000000000001193. Epub 2023 Nov 30. Erratum in: Circulation. 2024 Jan 2;149(1):e167. PMID: 38033089. Correction to: 2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation. 2024 Jan 2;149(1):e167. doi: 10.1161/CIR.0000000000001207. Epub 2023 Dec 28. Erratum for: Circulation. 2024 Jan 2;149(1):e1-e156. PMID: 38153996.

23. Kapa, S, Epstein AE, Callans DJ, Garcia FC, Lin D, Bala R, et al. Assessing arrhythmia burden after catheter ablation of atrial fibrillation using an implantable loop recorder: the ABACUS study. J. Cardiovasc. Electrophysiol. 2013 Aug;24(8):875-8.

24. Kaura A, Sztriha L, Chan FK, Aeron-Thomas J, Gall N, Piechowski-Jozwiak B, et al. Early prolonged ambulatory cardiac monitoring in stroke (EPACS): an open-label randomised controlled trial. Eur J Med Res. 2019 Jul 26;24(1):25.

25. Kleindorfer DO, Towfighi A, Chaturvedi S, Cockroft KM, Gutierrez J, Lombardi-Hill D, et al. 2021 Guideline for the Prevention of Stroke in Patients With Stroke and Transient Ischemic Attack: A Guideline From the American Heart Association/American Stroke Association. Stroke. 2021 Jul;52(7):e364-e467.

26. Koh KT, Law WC, Zaw WM, Foo DHP, Tan CT, Steven A, et al. Smartphone electrocardiogram for detecting atrial fibrillation after a cerebral ischaemic event: a multicentre randomized controlled trial. Europace. 2021 Jul 18;23(7):1016-1023.

27. Kusumoto FM, Schoenfeld MH, Barrett C, Edgerton JR, Ellenbogen KA, Gold MR, et al. 2018 ACC/AHA/HRS Guideline on the Evaluation and Management of Patients With Bradycardia and Cardiac Conduction Delay: Executive Summary. Circulation. 2018 Nov 6:CIR0000000000000627.

28. Kwun JS, Yoon CH, Kim SH, Jeon KH, Kang SH, Lee W, et al. Surveillance of Arrhythmia in Patients After Myocardial Infarction Using Wearable Electrocardiogram Patch Devices: Prospective Cohort Study. JMIR Cardio. 2022 Jun 9;6(1):e35615.

29. Manetas-Stavrakakis N, Sotiropoulou IM, Paraskevas T, Maneta Stavrakaki S, Bampatsias D, et al. Accuracy of Artificial Intelligence-Based Technologies for the Diagnosis of Atrial Fibrillation: A Systematic Review and Meta-Analysis. J Clin Med. 2023 Oct 17;12(20):6576.

30. Nasir JM, Pomeroy W, Marler A, Hann M, Baykaner T, Jones R, et al. Predicting Determinants of Atrial Fibrillation or Flutter for Therapy Elucidation in Patients at Risk for Thromboembolic Events (PREDATE AF) Study. Heart Rhythm. 2017 Jul;14(7):955-961

31. Passman R, Leong-Sit P, Andrei AC, Huskin A, Tomson TT, Bernstein R, et al. Targeted Anticoagulation for Atrial Fibrillation Guided by Continuous Rhythm Assessment With an

Insertable Cardiac Monitor: The Rhythm Evaluation for Anticoagulation With Continuous Monitoring (REACT.COM) Pilot Study. J Cardiovasc Electrophysiol. 2016 Mar;27(3):264-70.

32. Perez MV, Mahaffey KW, Hedlin H, Rumsfeld JS, Garcia A, Ferris T, et al. Large-Scale Assessment of a Smartwatch to Identify Atrial Fibrillation. N Engl J Med. 2019 Nov 14;381(20):1909-1917.

33. Perino AC, Gummidipundi SE, Lee J, Hedlin H, Garcia A, Ferris T, et al. Arrhythmias Other Than Atrial Fibrillation in Those With an Irregular Pulse Detected With a Smartwatch: Findings From the Apple Heart Study. Circ Arrhythm Electrophysiol. 2021 Oct;14(10):e010063.

34. Podoleanu C, DaCosta A, Defaye P, et al. Early use of an implantable loop recorder in syncope evaluation: a randomized study in the context of the French healthcare system (FRESH study). Arch Cardiovasc Dis. 2014; 107(10):546-552.

35. Reed MJ, Grubb NR, Lang CC, O'Brien R, Simpson K, Padarenga M, et al. Multi-centre Randomised Controlled Trial of a Smartphone-based Event Recorder Alongside Standard Care Versus Standard Care for Patients Presenting to the Emergency Department with Palpitations and Pre-syncope: The IPED (Investigation of Palpitations in the ED) study. EClinicalMedicine. 2019 Mar 3;8:37-46.

36. Reiffel JA, Verma A, Kowey PR, Halperin JL, Gersh BJ, Wachter R, et al. Incidence of Previously Undiagnosed Atrial Fibrillation Using Insertable Cardiac Monitors in a High-Risk Population: The REVEAL AF Study. JAMA Cardiol. 2017 Oct 1;2(10):1120-1127.

37. Sanna T, Diener HC, Passman RS, et al. Cryptogenic stroke and underlying atrial fibrillation. N Engl J Med. 2014; 370(26):2478-2486

38. Sheldon RS, Grubb BP, Olshansky B, Shen WK, Calkins H, Brignole M, et al. 2015 Heart Rhythm Society Expert Consensus Statement on the Diagnosis and Treatment of Postural Tachycardia syndrome, inappropriate sinus tachycardia, and vasovagal syncope. Heart Rhythm. 2015; Reaffirmed 2020. Jun;12(6):e41-63.

39. Shen WK, Sheldon RS, Benditt DG, Cohen MI, Forman DE, Goldberger ZD, et al. 2017 ACC/AHA/HRS Guideline for the Evaluation and Management of Patients With Syncope: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. Circulation. 2017 Aug 1;136(5):e25-e59.

40. Singh B, Rao HB, Pandurangi U, Manjunath CN, Sharma G, Naik A, et al. Identifying high risk patients post myocardial infarction with reduced left ventricular function using loop recorders INSPIRE-ELR clinical study. Indian Heart J. 2022 May-Jun;74(3):194-200.

41. Solbiati M, Casazza G, Dipaola F, Barbic F, Caldato M, Montano N, et al. The diagnostic yield of implantable loop recorders in unexplained syncope: A systematic review and meta-analysis. Int J Cardiol. 2017 Mar 15;231:170-176.

42. Solbiati M, Costantino G, Casazza G, Dipaola F, Galli A, Furlan R, et al. Implantable loop recorder versus conventional diagnostic workup for unexplained recurrent syncope. Cochrane Database Syst Rev. 2016 Apr 19;4:CD011637.

43. Steinhubl SR, Waalen J, Edwards AM, Ariniello LM, Mehta RR, Ebner GS, et al. Effect of a Home-Based Wearable Continuous ECG Monitoring Patch on Detection of Undiagnosed Atrial Fibrillation: The mSToPS Randomized Clinical Trial. JAMA. 2018 Jul 10;320(2):146-155.

44. Sulke N, Sugihara C, Hong P, Patel N, Freemantle N. The benefit of a remotely monitored implantable loop recorder as a first line investigation in unexplained syncope: the EaSyAS II trial. Europace. 2016 Jun;18(6):912-8.

45. Svendsen JH, Diederichsen SZ, Højberg S, Krieger DW, Graff C, Kronborg C, et al. Implantable loop recorder detection of atrial fibrillation to prevent stroke (The LOOP Study): a randomised controlled trial. Lancet. 2021 Oct 23;398(10310):1507-1516.

46. Tanno K. Use of implantable and external loop recorders in syncope with unknown causes. J Arrhythm. 2017 Dec;33(6):579-582

47. Thijs VN, Brachmann J, Morillo CA, Passman RS, Sanna T, Bernstein RA et al. Predictors for atrial fibrillation detection after cryptogenic stroke: results from CRYSTAL AF. Neurology. 2016;86(3):261-269.

48. U.S. Food and Drug Administration (FDA). Center for Devices and Radiological Health (CDRH). Searchable 510(k) database. Product Code: DSH. Accessed Jan 2024. Available at URL address: http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm

49. U.S. Food and Drug Administration (FDA). 510(k) summary. Center for Devices and Radiological Health (CDRH). K020825. King of Hearts Express + AF Monitor. 2002 April. Accessed Jan 2024. Available at URL address: https://www.accessdata.fda.gov/SCRIPTS/cdrh/devicesatfda/index.cfm?db=pmn&id=K020825

50. U.S. Food and Drug Administration (FDA). 510(k) summary. Center for Devices and Radiological Health (CDRH). K133701. Nuvant™ Mobile Cardiac Telemetry System. 2014 February. Accessed Jan 2024. Available at URL address: https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm?ID=K133701

51. U.S. Food and Drug Administration (FDA). 510(k) summary. Center for Devices and Radiologic Health (CDRH). 510(k) K113862. Zio®Patch. 2012 February. Accessed Jan 2024. Available at URL address: https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm?ID=K113862

52. U.S. Food and Drug Administration (FDA). 510(k) summary. Center for Devices and Radiologic Health (CDRH). 510(k). K221962. LINQ II Insertable Cardiac Monitor. August 25, 2022.Accessed Jan 2023. Available at URL address: https://www.accessdata.fda.gov/cdrh_docs/pdf22/K221962.pdf https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm?ID=K221962 (In 2022, expanded to include use if at least 2 years old).

53. U.S. Food and Drug Administration (FDA). 510(k) summary. Center for Devices and Radiologic Health (CDRH). 510(k) K210753. KardiaMobile 6L. June 30, 2021. Accessed Jan 2024. Available at URL address: https://www.accessdata.fda.gov/cdrh_docs/pdf21/K210753.pdf

54. US Preventive Services Task Force, Davidson KW, Barry MJ, Mangione CM, Cabana M, Caughey AB, et al. Screening for Atrial Fibrillation: US Preventive Services Task Force Recommendation Statement. JAMA. 2022 Jan 25;327(4):360-367.

55. Wachter R, Gröschel K, Gelbrich G, Hamann GF, Kermer P, Find-AF (randomised) Investigators and Coordinators, et al. Holter-electrocardiogram-monitoring in patients with acute ischaemic stroke (Find-AFRANDOMISED): an open-label randomised controlled trial. Lancet Neurol. 2017 Apr;16(4):282-290. doi: 10.1016/S1474-4422(17)30002-9. Epub 2017 Feb 8. Erratum in: Lancet Neurol. 2017 Apr;16(4):261. PMID: 28187920.

56. Wechselberger S, Kronborg M, Huo Y, Piorkowski J, Neudeck S, Päßler E, et al. Continuous monitoring after atrial fibrillation ablation: the LINQ AF study. Europace. 2018 Nov 1;20(FI_3):f312-f320.

57. William AD, Kanbour M, Callahan T, Bhargava M, Varma N, et al. Assessing the accuracy of an automated atrial fibrillation detection algorithm using smartphone technology: The iREAD Study. Heart Rhythm. 2018 Oct;15(10):1561-1565.

58. Writing Committee Members; Shah MJ, Silka MJ, Silva JNA, Balaji S, et al. 2021 PACES Expert Consensus Statement on the Indications and Management of Cardiovascular Implantable Electronic Devices in Pediatric Patients: Developed in collaboration with and endorsed by the Heart Rhythm Society (HRS), the American College of Cardiology (ACC), the American Heart Association (AHA), and the Association for European Paediatric and Congenital Cardiology (AEPC) Endorsed by the Asia Pacific Heart Rhythm Society (APHRS), the Indian Heart Rhythm Society (IHRS), and the Latin American Heart Rhythm Society (LAHRS). JACC Clin Electrophysiol. 2021 Nov;7(11):1437-1472.

Revision Details

Type of Revision	Summary of Changes	Date
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

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