MASSACHUSETTS

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Medical Policy

# Ambulatory Electrocardiograph (AECG) Monitoring

## Table of Contents



## Policy Number: 119

BCBSA Reference Number: N/A

## Related Policies

National Coverage Determination (NCD) Electrocardiographic Services 20.15

## Policy

### Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity

**Ambulatory Electrocardiograph (AECG) Monitoring**[1]

AECG monitoring, when performed with a device that has FDA clearance for this purpose, will be considered **MEDICALLY NECESSARY** in the following situations:

1. When a standard 12-lead electrocardiograph (ECG), cardiac history and cardiac physical exam has not satisfactorily explained the patient's cardiac complaints and AECG testing will provide diagnostic information that will assist in developing a treatment plan or changing a treatment plan for patients that are at risk for cardiac arrythmias[3,6,7] **OR**
2. For patients experiencing unexplained syncope, near syncope, episodic dizziness, chest pain, palpitations, and/or shortness of breath[6] **OR**
3. To assess documented or suspected bradycardia[8] **OR**
4. For patients experiencing nocturnal arrhythmias[6] **OR**
5. To assess the average heart rate and adequacy of rate control in a patient with atrial fibrillation[6] **OR**
6. To aid in the adjustment of anti-arrhythmic drug dosage[3,6,7,9] **OR**
7. To assess the effectiveness of anti-arrhythmia therapy (e.g., post ablation)[6] **OR**
8. To evaluate prognosis following acute coronary syndrome[6,10] **OR**
9. Pre/Post implantable cardiac defibrillator reprogramming[7] **OR**
10. To assess for silent myocardial ischemia in a patient with known or suspected coronary heart disease [3,6] **OR**
11. To assess for asymptomatic ventricular premature beats or non-sustained ventricular tachycardia in patients with hypertrophic cardiomyopathy, arrhythmogenic right ventricular cardiomyopathy, long QT syndrome, dilated or restrictive cardiomyopathy, congenital heart disease, or Brugada syndrome[6,7] **OR**
12. To evaluate for occult atrial fibrillation (A-Fib) as a potential cause of cardio-embolism in patients with cryptogenic stroke.[4,6]

**Notes:**

- A 24–48-hour monitor is most appropriate for patients with daily or near daily symptoms.[6] Otherwise, providers should order the most appropriate type of AECG for the patient based on their evaluation of the patient, the patient's symptoms, and the devices' labeled indications.
- The duration of monitoring should be consistent with the frequency and duration of the patient's signs and symptoms[3,6,11,12,13]

The following are considered **NOT MEDICALLY NECESSARY**:

1. Devices that do not have FDA clearance, for this purpose including non-physician prescribed; hand/wrist held or worn smart phone or smart watch or activity tracker based devices.
2. AECG monitoring of potentially harmful ventricular arrhythmias requiring inpatient level of care.[12,14]
3. Any 24-hour monitoring station that does not meet the definition in the definition section.[3,4,5]

### Mobile Cardiac Outpatient Telemetry[2]

The use of outpatient cardiac telemetry (also known as mobile cardiac outpatient telemetry as a diagnostic alternative to AEMs in individuals who experience infrequent symptoms (less frequently than every 48 hours) suggestive of cardiac arrhythmias (ie, palpitations, dizziness, presyncope, syncope) is considered **MEDICALLY NECESSARY**.

Other uses of AEMs, including outpatient cardiac telemetry and mobile applications, are considered **INVESTIGATIONAL**, including but not limited to monitoring asymptomatic individuals with risk factors for arrhythmia, monitoring the effectiveness of antiarrhythmic medications, and detection of myocardial ischemia by detecting ST- segment changes.

### Transtelephonic Transmission of Post-Symptom Electrocardiograms and Cardiac Event Monitors[2]

Transtelephonic transmission of post-symptom electrocardiograms and cardiac event monitors **may be MEDICALLY NECESSARY for the following indications, when used to evaluate individuals in remote areas or long distances (such as 100 miles) from physicians capable of interpreting ECG:**

- To detect, characterize, and document symptomatic transient arrhythmias
- To assess anti-arrhythmic drug efficiency, and
- To carry out early post-hospital monitoring of individuals discharged after a myocardial infarction, if 24 hour coverage is provided. Such coverage must be performed by an experienced electrocardiogram technician receiving the calls (tapes and facsimiles do not count). These technicians must have immediate access to a physician and have been instructed when and how to contact available facilities to assist the patient in case of emergencies.
- This policy statement applies to plain EKGs (ECGs, electrocardiograms) only, transmitted electronically for the purposes of interpretation, and
- Transmitting devices must be capable of transmitting ECG leads I, II, and III, and transmissions must be comparable to readings obtained by conventional ECGs, to permit proper interpretation of abnormal cardiac rhythms.

**NOTE:** Facsimiles and tapes are not reimbursed.

## Prior Authorization Information

**Inpatient**

- For services described in this policy, precertification/preauthorization **IS REQUIRED** for all products if the procedure is performed **inpatient**.

**Outpatient**

- For services described in this policy, see below for products where prior authorization **might be required** if the procedure is performed **outpatient**.

| | Outpatient |
|---|---|

| | |
|---|---|
| **Commercial Managed Care (HMO and POS)** | Prior authorization is **not required**. |
| **Commercial PPO and Indemnity** | Prior authorization is **not required**. |

## CPT Codes / HCPCS Codes / ICD Codes

*Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.*

*Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.*

*The following codes are included below for informational purposes only; this is not an all-inclusive list.*

**The above medical necessity criteria MUST be met for the following codes to be covered for Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity:**

### CPT Codes

| CPT codes: | Code Description |
|---|---|
| 93224 | External electrocardiographic recording up to 48 hours by continuous rhythm recording and storage; includes recording, scanning analysis with report, review and interpretation by a physician or other qualified health care professional |
| 93225 | External electrocardiographic recording up to 48 hours by continuous rhythm recording and storage; recording (includes connection, recording, and disconnection) |
| 93226 | External electrocardiographic recording up to 48 hours by continuous rhythm recording and storage; scanning analysis with report |
| 93227 | External electrocardiographic recording up to 48 hours by continuous rhythm recording and storage; review and interpretation by a physician or other qualified health care professional |
| 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 |
| 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 |
| 93297 | Interrogation device evaluation(s), (remote) up to 30 days; implantable cardiovascular physiologic monitor system, including analysis of 1 or more recorded physiologic cardiovascular data elements from all internal and external sensors, analysis, review(s) and report(s) by a physician or other qualified health care professional |
| 93298 | Interrogation device evaluation(s), (remote) up to 30 days; subcutaneous cardiac rhythm monitor system, including analysis of recorded heart rhythm data, analysis, review(s) and report(s) by a physician or other qualified health care professional |

**Link to A59268 Billing and Coding: Ambulatory Electrocardiograph (AECG) Monitoring covered ICD diagnosis codes**

**In addition to the covered diagnosis codes in Billing and Coding Article A59268, the following ICD diagnosis codes are considered medically necessary for commercial products when submitted with the CPT/HCPCS codes above if medical necessity criteria are met:**

## ICD-10 Diagnosis Codes

| ICD-10-CM diagnosis codes: | Code Description |
|---|---|
| I46.9 | Cardiac arrest, cause unspecified |

## Description

**Table of Various AECG Monitors**

| Type of Monitor | Description | CPT Codes |
|---|---|---|
| External ECG (Holter) | Monitors for up to 48 hours by continuous rhythm recording and storage. | 93224-93227 |
| Extended or long-term external ECG | Monitors greater than 48 hours up to 7 days by continuous rhythm recording and storage. | 93241-93244 |
| Extended or long-term external ECG | Monitors greater than 7 days up to 15 days by continuous rhythm recording and storage. | 93245-93248 |

| | | |
|---|---|---|
| External patient-activated/auto-activated ECG rhythm derived event recording (Event monitors) | Monitors with symptom-related memory loop with Remote download capability or 24-hour attended monitoring. May be worn for up to 30 days. | 93268-93272 |
| External mobile cardiovascular telemetry monitors | Concurrent computerized real-time data analysis and greater than 24 hours of accessible ECG data storage with ECG-triggered and patient-selected events transmitted to a remote attended surveillance center. May be worn for up to 30 days. | 93228- 93229 |
| Subcutaneous Cardiac Rhythm Monitor (SCRM) | Implanted, continuous recording that is patient or rhythm activated. The recording is transmitted for delayed interpretation and/or is interpreted by a 24- hour attendant surveillance office in real time. | 93298 |

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

AECG continues to advance at a rapid pace and incorporates various monitoring devices and indications for use. These devices range from Holter Monitors, Event Recorders/Monitors, Patch Recorders, External Loop Recorders, Mobile Cardiovascular Telemetry, Mobile Cardiovascular Outpatient Telemetry, Insertable Cardiac Monitor/Internal Loop Recorders, and Subcutaneous Cardiac Rhythm Monitors.

They are differentiated by capabilities and the varying technical components among devices, such as intermittent/continuous recording, patient/rhythm activated recording, number of leads, time frames of use and whether the rhythm is interpreted in real time (attended surveillance) or if it is transferred from the device and interpreted at a later time. Regardless of the equipment, these devices provide valuable data for diagnosis of palpitations, syncope and other signs and symptoms suggestive of cardiac arrhythmia.

The scope of this LCD is to delineate the specific patient indications that support medical necessity for this type of monitoring.

**Definitions**

**Acute Coronary Syndrome (ACS)** applies to patients with suspicion or confirmation of acute myocardial ischemia or infarction. It describes a large array of signs and symptoms that range from atypical chest discomfort, nonspecific electrocardiographic changes, normal cardiac biomarkers, non-ST-elevation myocardial infarction (NSTEMI), large ST-segment elevation myocardial infarction (STEMI), and cardiogenic shock.[1]

**Silent Myocardial Ischemia** is defined as 'objective documentation of myocardial ischemia in the absence of angina or anginal equivalents.'[2]

**24-hour Monitoring Station** (applicable only to mobile cardiac telemetry) - is defined as a receiving station facility staffed and in operation 24-hours per day, seven days a week. The staff should have immediate 24-hour access to a physician to review transmitted data that falls outside of set parameters. Staff should know how to contact available facilities to assist in any cardiac emergencies.[3,4,5].

## Summary

**Summary of Evidence**

**Clinical Practice**

Zimetbaum et al[14] provides an overview and evaluation for care with patients that present with palpitations. There are many factors to be considered in the etiology of palpitations. Cardiac disorders are the most common cause of palpitations and include arrhythmias, structural heart disease, conduction system abnormalities, valvular disease, pacemaker syndrome, atrial myoma, sympathetic stimulation and catecholamine release during exercise and high output cardiac states. Other etiology of palpitations may include psychiatric disorders, medication effects, substance abuse, endocrine disorders, and metabolic disorders.

The workup for a patient who presents with palpitations typically includes an extensive medical history along with a 12-lead ECG, physical exam and limited laboratory testing.[14(p3)]

When an arrhythmia is not identified on the 12-lead ECG, the patient's medical history can be helpful to note the age of symptom onset, duration of palpitations, heart rate and rhythm regularity, additional symptoms that are associated with the palpitations (pre-syncope or syncope), the onset and resolution of the palpitations, effects of positional changes and if the patient is able to alleviate the palpitations on their own. In addition, the cardiac exam should include the patient's family cardiac history and co-existing medical conditions such as pregnancy, metabolic and endocrine issues, chronic obstructive pulmonary disease, and psychiatric disorders.[14(p2)]

Following an extensive cardiac exam, if the etiology of the palpitations remains unclear limited laboratory testing for anemia, hyperthyroidism, and toxicology testing may be indicated, as well as echocardiography for patients with possible structural heart disease.

**Holter vs. Continuous Long-Term Electrocardiographic (LT-ECG) Monitors**
Barrett et al[15] conducted a prospective analysis of cardiac arrhythmias using the Holter monitor and the Zio patch between April 2012 and July 2012. The goal was to compare arrhythmia detections over the course of 14 days to the arrhythmia events detected in the first 24 hours of monitoring.

One hundred and forty-six patients between the ages of 22 and 94 participated in the study. The average wear time of the AECG monitors ranged between one day for the Holter monitor and eleven days for the patch monitor. Both devices were activated simultaneously and monitored for 24 hours for the Holter monitor and up to 14 days for the patch monitor. All arrhythmias were evaluated by the Scripps Translational Science Institute and the McNemar's test was implemented to compare if arrhythmias were clinically significant and what type of arrhythmias were detected by each monitor.

Arrhythmia detection was placed into six categories: supraventricular tachycardia (SVT) (>4 beats, not including A-Fib or A-Flutter), A-Fib/A-Flutter (>4 beats), pause >3 seconds, atrioventricular block (Mobitz type II or third-degree atrioventricular [AV] block), ventricular tachycardia (VT) (>4 beats), or polymorphic ventricular tachycardia/ventricular fibrillation.[15(p14)]

The results demonstrated that the "patch monitor detected 96 arrhythmia events compared with 61 arrhythmia events by the Holter monitor ($P < .001$)."[15(p12)] The patch monitor and Holter monitor detected the same number of events, but "14 clinically significant arrhythmia events were detected by the adhesive patch monitor that went undetected by the Holter monitor."[15(p12)]

The secondary effect was to determine the arrhythmias that were detected in the first 24 hours. It was noted that the Holter monitor detected 61 arrhythmias compared to 52 arrhythmias detected by the patch monitor ($P=.013$). In review of the arrhythmia types three events were considered 'clinically significant' and were ultimately detected by the patch monitor beyond the first 24 hours.

In conclusion, the first seven days of AECG monitoring has the greatest detection of arrhythmias. Typically monitoring greater than seven days may only provide an additional 3.9% chance of identifying a different diagnosis as noted by the Zimetbaum (1998) article.

Rosenberg et al[16] conducted a single-center pilot study to compare the use of a continuous LT-ECG recorder, with a 24-hour Holter monitor in 74 patients with paroxysmal A-Fib (AF), between April 2011 and

May 2012. During the initial 24-hour monitoring period, both the Holter monitor, and the continuous LT-ECG recorder detected 25 AF occurrences. Patients continued to wear the continuous LT-ECG recorder for an additional two weeks, during which 43 more patients were diagnosed with AF. This indicates that AF episodes were detected in significantly more patients wearing a continuous LT-ECG recorder due to the longer duration of detection, compared with the Holter monitor. Furthermore, in this study, the LT-ECG recorder also detected cardiac pauses after the initial 24-hour monitoring, thus prompting physicians to review medications and initiate pacemaker referrals for this patient group.

**Holter Monitor**

Paudel et al[17] conducted a prospective, single center study that included 335 patients who had symptoms of recurrent chronic palpitations or a single episode of palpitations. These patients were older than 18 years of age and the study was conducted from January 2010 to May 2012.

Patients were provided a Cardio Blue® 24-hour Holter monitor that recorded in either three or five channels and allowed for recording of arrhythmias, as defined by the American College of Cardiology (ACC)/American Heart Association (AHA), with or without corresponding documented symptoms.

The arrhythmias that were identified via the Holter monitor were: less than 10% ventricular ectopy, 36.7% bigeminy, less than 10% supraventricular episodes, 5.7% non-sustained VT and 12.5% sustained VT. The study groups were noted to be statistically significant for patients that were younger than 50 years of age and those who were 50 years of age or older. The highest categories of arrhythmias were related to patients that were older than 50 years of age. This study group had a 72% rate with premature ventricular contactions (PVCs) and 44% with bigeminy as compared to 38.7% having PVCs and 23.1% with bigeminy that were younger than 50 years of age.

The authors reviewed literature provided by Mayet (1995) and Stein (2010). The conclusion of those two articles determined that Holter monitors detect arrhythmias such as ventricular bigeminy, VT, SVT, AV blocks, and silent ischemia in older patients who are more at risk of sudden cardiac death.

**Event Recorders/Intermittent Monitors**

Fredriksson et al[18] studied intermittent AECG recordings versus continuous event recording in detecting A-Fib for patients 75-76 years of age. Two-hundred and sixty-nine patients that were included in this analysis were from the STROKESTOP II study from Europe. This study was conducted over a two-week period with 55 days on average for the intermittent recorders and 13 days on average for the continuous recorders. The devices were R-test 4® and Novocaor® (for continuous recording) and a 30 second handheld device Zenicor II® (for intermittent recording). All devices had activation buttons for symptomatic arrhythmias, and patients were given a symptom diary as well. Within the study, A-Fib was defined by the European Society of Cardiology (ESC) as “absolute irregular rate-to-rate intervals, no discernable distinct p-waves, and duration of at least 30 seconds” and recordings were manually inspected and validated on computerized algorithms.[18(p360)]

After the review of data, it was determined that continuous event recordings identified three times more cases of A-Fib (6%; n=15/269) than the intermittent AECG recordings (2%; n=5/269) (*p*=.002). On average, continuous recordings identified a 1-8 interquartile range (IQR) on day four and a 4-14 IQR on day eight for intermittent monitoring (*P*=.135). These IQR’s were analyzed using the Mann-Whitney U test and Chi-square tests in relation to proportions. While comparisons between the two monitoring methods were performed, the use of the McNemar’s test resulted in P< .05, which was considered significant when testing for dichotomous variables and paired sample t-test for continuous variables.[18(p356)]

Surprisingly, only six percent of the patients reported symptoms within their diaries when having verified A-Fib and none of the patients had reported palpitations. Limitations of the study include: patients that were part of a larger study (STROKESTOP II) and were thus highly motivated and possibly healthier than peers, use of one-lead AECGs that potentially complicate the analysis of the p-waves, possible bias by misclassification case, and conflicts of interest for those study team members receiving grants from companies such as Bayer, Pfizer, Sanofi, AstraZeneca, and Medtronic.

**External Loop Recorders/Mobile Cardiovascular Outpatient Telemetry**
Favilla et al[19] provides a retrospective cohort study of 227 patients with cryptogenic stroke (179 patients) or transient ischemic stroke (48 patients). These patients underwent a 28-day mobile cardiac outpatient telemetry (MCOT), post cryptogenic or transient ischemic stroke. Of the 277 patients, 14% had A-Fib detected on MCOT, 58% of which was ≥ 30 seconds in duration. It was determined that age and prior cortical or cerebellar infarctions were independent predictors of A-Fib.

Rothman et al[20] provided a prospective clinical trial of randomized patients that were evaluated with the CardioNet® system in 17 multicenter facilities. Two-hundred and sixty-six patients who had palpitations, presyncope, and/or syncope were included. The goal was to confirm or exclude the etiology of arrhythmias that caused patient symptoms. All patients had previously undergone 24 hours of monitoring with a Holter monitor, which failed to provide diagnostic information. These patients were placed in two groups for 30 days of monitoring with either the MCOT or with an external looping event monitor (ELM).

During monitoring, clinically significant arrhythmias were detected in 55 (41%) patients with the MCOT versus 19 (15%) patients with the ELM ($P< 0.001$). For patients who had prior syncope or presyncope, clinically significant arrhythmias were detected in 52% of patients with MCOT and in 16% of patients with loop recorders ($P< 0.001$). In most cases, the arrhythmias detected were A-Fib, atrial flutter, or ventricular tachycardia. There were two subgroups noted in the study. For one subgroup of patients presenting with "syncope or presyncope, a diagnosis was made in 89% of MCOT subjects versus 69% of LOOP subjects ($P=0.008$)."[20(p243)] A second subgroup analysis was performed at the centers that used auto-triggered loop monitoring rather than patient-activated monitoring. For this subgroup, a definitive diagnosis was obtained for 88% of MCOT patients and only 46% ($P=0.002$) of the ELM patients; however, this subgroup analysis involved only 50 of the 266 patients.

**Insertable Cardiac Monitor/Subcutaneous Cardiac Rhythm Monitors**
Nadkarni[21] provides an overview of subcutaneous cardiac rhythm monitors (SCRMs) with the high diagnostic yield for "cryptogenic stroke, syncope, palpitation and AF [A-Fib] Monitoring."[21(p588)] It has long been noted that there is no established guideline for the use of SCRMs and the rate of false-positive transmissions has been the 'Achilles heel' of AECG. The author determines that the indications for use, techniques used in implantation, programming, and connectivity determine the clinical benefits for patients. Within this overview the author cites the ABACUS prospective randomized control trial by Kapa et al. This trial noted that SCRMs "led to more actionable events and higher rates of antiarrhythmic discontinuation when compared with other forms of rhythm monitoring in a post AFib ablation population."[21(p588)]

The versatility of the SCRM allows for adjustments in tachycardia and bradycardia thresholds, minimum episode durations, and the detection of atrial tachycardia and atrial fibrillation. Along with the versatility is the ability to transmit data in two ways: alert notifications and manual downloads by the patient via their home or cell phone application. With that noted and continual advancements, SCRMs have proven to be beneficial for patients.

SCRMs remain a valuable tool in the diagnosis of cardiac events.

**Professional Societies and Associations**
*American College of Cardiology (ACC)/American Heart Association (AHA) Task Force on Clinical Practice Guidelines*
Kusumoto[8] provides a consensus statement on behalf of the ACC/AHA and the task force for clinical practices. The statement provides an overview and recommendations regarding appropriate use of AECG monitoring, particularly in the context of diagnosing bradyarrhythmia, and patients with bradycardia and cardiac conduction delays, patients can be managed with a 24-to-48-hour continuous AECG. For patients that present with symptoms that are greater than 30 days between symptoms, the use of a broad array of modalities, such as long-term monitors, implantable cardiac monitors, etc., would be appropriate if the initial non-invasive evaluation was not diagnostically conclusive. The guideline indicates that the "Choice of device is predicated on frequency of symptoms and the degree to which symptoms incapacitate the

patient" and that regardless of the monitoring system, it is important for the system to notify health care providers in a timely fashion, especially in regard to identifying potentially dangerous arrhythmias.[8(p399)]

*American Heart Association /American College of Cardiology/ Heart Rhythm Society Clinical Practice Guidelines*
Al-khatib[9] provides clinical guidelines for the use of AECG monitoring indicating that suspected arrhythmias, the frequency of arrhythmias, and the associated symptoms dictate monitor type. For example, event or 'Looping' monitors are more appropriate and have greater diagnostic yields for sporadic symptoms. It further explains that when ventricular arrhythmias are identified and potentially harmful, AECG may not be appropriate. Further information upon the use of AECG monitoring is indicated when assessing medical therapy response.

*International Society for Holter and Noninvasive Electrocardiology (ISHNE), and the Heart Rhythm Society (HRS) expert consensus statement*
Steinberg[7] provides a consensus statement that outlined the limitations, clinical indications, pharmacological treatment of arrhythmias, and the use of external monitoring for pacemaker malfunctioning/placement. It is noted that for the selection of specific AECG monitors, one must consider the diagnostic power, the monitoring capability and the accuracy, local availability, symptom frequency, patient compliance and the condition of the patient. Within the article there are descriptions of advantages and limitations associated with each AECG monitor. The clinical indications for use of the various types of monitors can include the following: syncope, bradyarrhythmia, tachyarrhythmia, palpitations, chest pain and coronary ischemia, ischemic heart diseases and postinfarction, hypertrophic cardiomyopathy, arrhythmic right ventricular dysplasia/cardiomyopathy, Wolff-Parkinson-White syndrome, inherited primary arrhythmic diseases, Short or Long QT syndrome, Brugada syndrome, catecholaminergic polymorphic ventricular tachycardias, early repolarization syndromes, idiopathic ventricular fibrillation with nonischemic dilated cardiomyopathy, dialysis and chronic kidney disease associated arrhythmias. It is noted that the use of monitoring with AECG for neurological and muscular disease is controversial. The article further indicates an appropriate clinical assessment may include a continuous AECG, and if unsuccessful, additional monitoring should include an intermittent external loop recording. If patients remain undiagnosed after prolonged noninvasive monitoring, an internal loop recorder (ILR) may be necessary.

**Analysis of Evidence (Rationale for Determination)**
Coverage of items and services in the Medicare program is provided based on what is medically reasonable and necessary. This concept is operationalized by the application of evidentiary standards, clinical validity, and clinical utility. Over the years, AECG monitoring has advanced and evolved to include a spectrum of technology, from the long standing Holter monitors to the present-day Bluetooth enabled AECG monitors that allow for increased functionality and patient convenience. Arrhythmias often remain unpredictable in onset, vary in duration and the episodes can be incapacitating and life threatening for the patient. The evidence thresholds for coverage are a careful balance of benefits and harms in the consideration of net health outcomes.

The FDA provides controls and guidance in relation to AECG's through the FDA 510(k) device approval. There are over 400 approved AECG monitoring devices aimed at improving the recognition, interpretation, and etiology of various arrhythmias. With these devices, health care professionals have many choices for obtaining the necessary diagnostic information.

In review of these clinical trials, randomized controlled trials (RCTs), meta-analyses, societal recommendations, and literature it is noted that there are different standards for AECG based on patient symptoms, antiarrhythmic regulation, post internal cardiac defibrillator insertion, cryptogenic stroke, cardio-embolism, transient ischemic stroke, silent myocardial ischemia, conduction disorders, and the evaluation of A-Fib/A-Flutter. It is generally expected that through a detailed exam that is based on patient signs and symptoms, a thorough cardiac exam, review of the patient medical/family histories to assess for conduction system abnormalities, valvular disease, metabolic disorders, endocrine issues, chronic obstructive pulmonary disease, structural heart disease, toxicology, and physiological disorders, the practitioner will be able to diagnose and treat the patient. If further diagnostic information is needed, a 12-lead EKG is appropriate and when combined with the patient's capability and potential compliance, will

aid the healthcare provider in determining if AECG monitoring is appropriate and which AECG monitoring device should be used.

Societal evidence provides the support for the use of AECG when evaluating for effective use of antiarrhythmic drugs, in the context of pre/post operative re-programing of defibrillators, to assess for known or suspected coronary artery disease, for evaluation and assessment of asymptomatic ventricular premature beats, and for evaluation and assessment of non-sustained ventricular tachycardia in patients with hypertrophic cardiomyopathy, arrhythmogenic right ventricular cardiomyopathy, long QT syndrome, dilated or restrictive cardiomyopathy, congenital heart disease, or Brugada syndrome.

The progression of non-invasive diagnostics to more invasive diagnostics is the standard of care taking into consideration benefits versus harm to patients while determining the etiology and treatment options for patients with arrhythmias. With the advancements in monitoring capabilities the ordering provider has multiple available alternatives to determine the type of monitoring needed for the individual needs of the patient.

After review of the available literature, it has been determined that limited coverage for AECG is medically reasonable and necessary when a 12-lead EKG does not provide an adequate diagnosis. It is expected that providers will use the most appropriate AECG device consistent with the patients' signs and symptoms.

## Policy History

| Date | Action |
|---|---|
| 11/2024 | Updated link to A59268. |
| 10/2024 | New medical policy describing medically necessary and not medically necessary indications. Effective 10/1/2024. Ongoing coverage information of Mobile Cardiac Outpatient Telemetry transferred from retired policy #347. Effective 10/1/2024. |

## Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:
Medical Policy Terms of Use
Managed Care Guidelines
Indemnity/PPO Guidelines
Clinical Exception Process
Medical Technology Assessment Guidelines

## References


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## Endnotes

[1] Ambulatory Electrocardiograph (AECG) Monitoring L39490. (A and B MAC, 04111, J - H)
Billing and Coding: Ambulatory Electrocardiograph (AECG) Monitoring A59268
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[2] Based on expert opinion.