BlueCross BlueShield Arizona

An Independent Licensee of the Blue Cross Blue Shield Association

EVIDENCE-BASED CRITERIA	**ORIGINAL EFFECTIVE DATE: 11/22/23**
SECTION: MEDICINE	**LAST REVIEW DATE: 07/02/24**
	CURRENT EFFECTIVE DATE: 07/02/24
	LAST CRITERIA REVISION DATE:
NEXT ANNUAL REVIEW DATE: 3RD QTR 2025	**ARCHIVE DATE:**

MOBILE CARDIAC OUTPATIENT TELEMETRY

Non-Discrimination Statement and Multi-Language Interpreter Services information are located at the end of this document.

Coverage for services, procedures, medical devices and drugs are dependent upon benefit eligibility as outlined in the member's specific benefit plan. This Evidence-Based Criteria must be read in its entirety to determine coverage eligibility, if any.

This Evidence-Based Criteria provides information related to coverage determinations only and does not imply that a service or treatment is clinically appropriate or inappropriate. The provider and the member are responsible for all decisions regarding the appropriateness of care. Providers should provide BCBSAZ complete medical rationale when requesting any exceptions to these guidelines.

The section identified as "Description" defines or describes a service, procedure, medical device or drug and is in no way intended as a statement of medical necessity and/or coverage.

The section identified as "Criteria" defines criteria to determine whether a service, procedure, medical device or drug is considered medically necessary or experimental or investigational.

State or federal mandates, e.g., FEP program, may dictate that any drug, device or biological product approved by the U.S. Food and Drug Administration (FDA) may not be considered experimental or investigational and thus the drug, device or biological product may be assessed only on the basis of medical necessity.

Evidence-Based Criteria are subject to change as new information becomes available.

For purposes of this Evidence-Based Criteria, the terms "experimental" and "investigational" are considered to be interchangeable.

EVIDENCE-BASED CRITERIA	**ORIGINAL EFFECTIVE DATE: 11/22/23**
SECTION: MEDICINE	**LAST REVIEW DATE: 07/02/24**
	CURRENT EFFECTIVE DATE: 07/02/24
	LAST CRITERIA REVISION DATE:
NEXT ANNUAL REVIEW DATE: 3RD QTR 2025	**ARCHIVE DATE:**

MOBILE CARDIAC OUTPATIENT TELEMETRY

Description:

Mobile Cardiac Outpatient Telemetry (MCOT):
Outpatient Cardiac Telemetry, also known as mobile cardiac outpatient telemetry or MCOT, provides continuous ECG recording where data is transmitted to a central recording station or facility with real-time monitoring and analysis.

Mobile cardiac outpatient telemetry devices may be used to evaluate symptoms suggestive of arrhythmias (e.g., syncope, palpitations), and may be used to detect arrythmias in individuals who have undergone cardiac ablation or who have a history of cryptogenic stroke.

Systems include, *but are not limited to*:

- CardioNet MCOT™ (BioTelemetry)
- HEARTLink II™
- LifeStar™ Mobile Cardiac Telemetry (LifeWatch Services)
- SmartCardia 7L (SmartCardia)
- Zio AT™ (iRhythm)

Criteria:

- Mobile cardiac outpatient telemetry (MCOT) is considered ***medically necessary*** with documentation of **ANY** of the following:

  1. Symptoms of syncope, near-syncope, or palpitations when there is clinical suspicion for significant bradyarrhythmia or tachyarrhythmia with non-diagnostic Holter monitoring, ambulatory event monitoring, or external loop recording performed for a period of at least 14 days within 60 days prior to the request for MCOT

  2. Ischemic stroke or transient ischemic attach (TIA) with suspected occult atrial fibrillation as the cause with non-diagnostic Holter monitoring, ambulatory event monitoring, or external loop recording performed for a period of at least 14 days within 60 days prior to the request for MCOT

  3. Monitoring arrythmia status following an ablation procedure

MOBILE CARDIAC OUTPATIENT TELEMETRY

- Mobile cardiac outpatient telemetry (MCOT) as a diagnostic alternative to ambulatory event monitors in individuals who experience infrequent symptoms (less frequently than every 48 hours) suggestive of cardiac arrhythmias (e.g., palpitations, dizziness, presyncope, syncope) is considered ***experimental or investigational*** when ***ONE*** or more of the following criteria are met:

  1. Lack of final approval from the appropriate governmental regulatory bodies (e.g., Food and Drug Administration); or
  2. Insufficient scientific evidence to permit conclusions concerning the effect on health outcomes; or
  3. Insufficient evidence to support improvement of the net health outcome; or
  4. Insufficient evidence to support improvement of the net health outcome as much as, or more than, established alternatives, or
  5. Insufficient evidence to support improvement outside the investigational setting

- Mobile cardiac outpatient telemetry (MCOT) or mobile applications are considered ***experimental or investigational*** when any **ONE** or more of the following criteria are met:

  1. Lack of final approval from the appropriate governmental regulatory bodies (e.g., Food and Drug Administration); or
  2. Insufficient scientific evidence to permit conclusions concerning the effect on health outcomes; or
  3. Insufficient evidence to support improvement of the net health outcome; or
  4. Insufficient evidence to support improvement of the net health outcome as much as, or more than, established alternatives, or
  5. Insufficient evidence to support improvement outside the investigational setting

  These indications include, *but are not limited to:*

  - Monitoring asymptomatic individuals with risk factors for arrhythmia
  - Monitoring the effectiveness of antiarrhythmic medications
  - Detection of myocardial ischemia by detecting ST-segment changes

---

Resources:

Literature reviewed 07/02/24. We do not include marketing materials, poster boards and non-published literature in our review

Resources prior to 07/02/24 may be requested from the BCBSAZ Medical Policy and Technology Research Department.

1. Afzal MR, Gunda S, Waheed S, et al. Role of Outpatient Cardiac Rhythm Monitoring in Cryptogenic Stroke: A Systematic Review and Meta-Analysis. *Pacing Clin Electrophysiol*. Oct 2015;38(10):1236-45. doi:10.1111/pace.12688

MOBILE CARDIAC OUTPATIENT TELEMETRY

2. Al-Khatib SM, Stevenson WG, Ackerman MJ, et al. 2017 AHA/ACC/HRS guideline for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death: Executive summary: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. *Heart Rhythm*. Oct 2018;15(10):e190-e252. doi:10.1016/j.hrthm.2017.10.035

3. Balmelli N, Naegeli B, Bertel O. Diagnostic yield of automatic and patient-triggered ambulatory cardiac event recording in the evaluation of patients with palpitations, dizziness, or syncope. *Clin Cardiol*. Apr 2003;26(4):173-6. doi:10.1002/clc.4960260405

4. Barrett PM, Komatireddy R, Haaser S, et al. Comparison of 24-hour Holter monitoring with 14-day novel adhesive patch electrocardiographic monitoring. *Am J Med*. Jan 2014;127(1):95 e11-7. doi:10.1016/j.amjmed.2013.10.003

5. Bhangu J, McMahon CG, Hall P, et al. Long-term cardiac monitoring in older adults with unexplained falls and syncope. *Heart*. May 2016;102(9):681-6. doi:10.1136/heartjnl-2015-308706

6. Bolourchi M, Batra AS. Diagnostic yield of patch ambulatory electrocardiogram monitoring in children (from a national registry). *Am J Cardiol*. Mar 1 2015;115(5):630-4. doi:10.1016/j.amjcard.2014.12.014

7. Brachmann J, Morillo CA, Sanna T, et al. Uncovering Atrial Fibrillation Beyond Short-Term Monitoring in Cryptogenic Stroke Patients: Three-Year Results From the Cryptogenic Stroke and Underlying Atrial Fibrillation Trial. *Circ Arrhythm Electrophysiol*. Jan 2016;9(1):e003333. doi:10.1161/CIRCEP.115.003333

8. Burkowitz J, Merzenich C, Grassme K, Bruggenjurgen B. Insertable cardiac monitors in the diagnosis of syncope and the detection of atrial fibrillation: A systematic review and meta-analysis. *Eur J Prev Cardiol*. Aug 2016;23(12):1261-72. doi:10.1177/2047487316632628

9. Centers for Medicare & Medicaid Services (CMS). National Coverage Determination (NCD) for Electrocardiographic Services (20.15). 2004. Accessed April 9, 2024. https://www.cms.gov/medicare-coverage-database/details/ncddetails.aspx?MCDId =16&ExpandComments= n&McdName= Thomson+Micromedex+ DrugDex+%C2%AE+Compendium+Revision+Request+-+CAG-00391&NCDId=179

10. Chao TF, Lin YJ, Tsao HM, et al. CHADS(2) and CHA(2)DS(2)-VASc scores in the prediction of clinical outcomes in patients with atrial fibrillation after catheter ablation. *J Am Coll Cardiol*. Nov 29 2011;58(23):2380-5. doi:10.1016/j.jacc.2011.08.045

11. Christensen LM, Krieger DW, Hojberg S, et al. Paroxysmal atrial fibrillation occurs often in cryptogenic ischaemic stroke. Final results from the SURPRISE study. *Eur J Neurol*. Jun 2014;21(6):884-9. doi:10.1111/ene.12400

12. Ciconte G, Saviano M, Giannelli L, et al. Atrial fibrillation detection using a novel three-vector cardiac implantable monitor: the atrial fibrillation detect study. *Europace*. Jul 1 2017;19(7):1101-1108. doi:10.1093/europace/euw181

13. Cotter PE, Martin PJ, Ring L, Warburton EA, Belham M, Pugh PJ. Incidence of atrial fibrillation detected by implantable loop recorders in unexplained stroke. *Neurology*. Apr 23 2013;80(17):1546-50. doi:10.1212/WNL.0b013e31828f1828

14. Culebras A, Messe SR, Chaturvedi S, Kase CS, Gronseth G. Summary of evidence-based guideline update: prevention of stroke in nonvalvular atrial fibrillation: report of the Guideline Development Subcommittee of the American Academy of Neurology. *Neurology*. Feb 25 2014;82(8):716-24. doi:10.1212/WNL.0000000000000145

15. Da Costa A, Defaye P, Romeyer-Bouchard C, 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*. Mar 2013;106(3):146-54. doi:10.1016/j.acvd.2012.12.002

16. Dagres N, Kottkamp H, Piorkowski C, et al. :Influence of the duration of Holter monitoring on the detection of arrhythmia recurrences after catheter ablation of atrial fibrillation: implications for patient follow-up. *Int J Cardiol*. Mar 18 2010;139(3):305-6. doi:10.1016/j.ijcard.2008.10.004

17. Davidson KW, Barry MJ, Mangione CM, et al. Screening for Atrial Fibrillation: US Preventive Services Task Force Recommendation Statement. *JAMA*. Jan 25 2022;327(4):360-367. doi:10.1001/jama.2021.23732

18. Derkac WM, Finkelmeier JR, Horgan DJ, Hutchinson MD. Diagnostic yield of asymptomatic arrhythmias detected by mobile cardiac outpatient telemetry and autotrigger looping event cardiac monitors. *J Cardiovasc Electrophysiol*. Dec 2017;28(12):1475-1478. doi:10.1111/jce.13342

19. Diederichsen SZ, Frederiksen KS, Xing LY, et al. Severity and Etiology of Incident Stroke in Patients Screened for Atrial Fibrillation vs Usual Care and the Impact of Prior Stroke: A Post Hoc Analysis of the LOOP Randomized Clinical Trial. *JAMA Neurol*. Oct 1 2022;79(10):997-1004. doi:10.1001/jamaneurol.2022.3031

20. Diederichsen SZ, Xing LY, Frodi DM, et al. Prevalence and Prognostic Significance of Bradyarrhythmias in Patients Screened for Atrial Fibrillation vs Usual Care: Post Hoc Analysis of the LOOP Randomized Clinical Trial. *JAMA Cardiol*. Apr 1 2023;8(4):326-334. doi:10.1001/jamacardio.2022.5526

21. Dorr M, Nohturfft V, Brasier N, et al. The WATCH AF Trial: SmartWATCHes for Detection of Atrial Fibrillation. *JACC Clin Electrophysiol*. Feb 2019;5(2):199-208. doi:10.1016/j.jacep.2018.10.006

22. Edvardsson N, Garutti C, Rieger G, Linker NJ, Investigators PS. Unexplained syncope: implications of age and gender on patient characteristics and evaluation, the diagnostic yield of an implantable loop recorder, and the subsequent treatment. *Clin Cardiol*. Oct 2014;37(10):618-25. doi:10.1002/clc.22300

23. Eisenberg E, Carlson SK, Doshi RH. Chronic ambulatory monitoring: results of a large single-center experience. *J Innovations Cardiac Rhythm Manage*. 2014 2014;(5):1818-1823.

24. Ermis C, Zhu AX, Pham S, et al. Comparison of automatic and patient-activated arrhythmia recordings by implantable loop recorders in the evaluation of syncope. *Am J Cardiol*. Oct 1 2003;92(7):815-9. doi:10.1016/s0002-9149(03)00889-0

25. Etgen T, Hochreiter M, Mundel M, Freudenberger T. Insertable cardiac event recorder in detection of atrial fibrillation after cryptogenic stroke: an audit report. *Stroke*. Jul 2013;44(7):2007-9. doi:10.1161/STROKEAHA.113.001340

26. 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. doi:10.1007/s10840-019-00515-0

27. Farris GR, Smith BG, Oates ET, Colon C, Doppalapudi H. New atrial fibrillation diagnosed by 30-day rhythm monitoring. *Am Heart J*. Mar 2019;209:29-35. doi:10.1016/j.ahj.2018.11.003

28. Farwell DJ, Freemantle N, Sulke AN. Use of implantable loop recorders in the diagnosis and management of syncope. *Eur Heart J*. Jul 2004;25(14):1257-63. doi:10.1016/j.ehj.2004.03.010

29. Favilla CG, Ingala E, Jara J, et al. Predictors of finding occult atrial fibrillation after cryptogenic stroke. *Stroke*. May 2015;46(5):1210-5. doi:10.1161/STROKEAHA.114.007763

30. Fitzmaurice DA, Hobbs FD, Jowett S, et al. Screening versus routine practice in detection of atrial fibrillation in patients aged 65 or over: cluster randomised controlled trial. *BMJ*. Aug 25 2007;335(7616):383. doi:10.1136/bmj.39280.660567.55

31. Ganesan AN, Chew DP, Hartshorne T, et al. The impact of atrial fibrillation type on the risk of thromboembolism, mortality, and bleeding: a systematic review and meta-analysis. *Eur Heart J*. May 21 2016;37(20):1591-602. doi:10.1093/eurheartj/ehw007

32. Giada F, Gulizia M, Francese M, et al. Recurrent unexplained palpitations (RUP) study comparison of implantable loop recorder versus conventional diagnostic strategy. *J Am Coll Cardiol*. May 15 2007;49(19):1951-6. doi:10.1016/j.jacc.2007.02.036

33. Gladstone DJ, Spring M, Dorian P, et al. Atrial fibrillation in patients with cryptogenic stroke. *N Engl J Med*. Jun 26 2014;370(26):2467-77. doi:10.1056/NEJMoa1311376

MOBILE CARDIAC OUTPATIENT TELEMETRY

34. Gladstone DJ, Wachter R, Schmalstieg-Bahr K, et al. Screening for Atrial Fibrillation in the Older Population: A Randomized Clinical Trial. *JAMA Cardiol*. May 1 2021;6(5):558-567. doi:10.1001/jamacardio.2021.0038

35. Go AS, Reynolds K, Yang J, et al. Association of Burden of Atrial Fibrillation With Risk of Ischemic Stroke in Adults With Paroxysmal Atrial Fibrillation: The KP-RHYTHM Study. *JAMA Cardiol*. Jul 1 2018;3(7):601-608. doi:10.1001/jamacardio.2018.1176

36. Gumbinger C, Krumsdorf U, Veltkamp R, Hacke W, Ringleb P. Continuous monitoring versus HOLTER ECG for detection of atrial fibrillation in patients with stroke. *Eur J Neurol*. Feb 2012;19(2):253-7. doi:10.1111/j.1468-1331.2011.03519.x

37. Halcox JPJ, Wareham K, Cardew A, et al. Assessment of Remote Heart Rhythm Sampling Using the AliveCor Heart Monitor to Screen for Atrial Fibrillation: The REHEARSE-AF Study. *Circulation*. Nov 7 2017;136(19):1784-1794. doi:10.1161/CIRCULATIONAHA.117.030583

38. Hanke T, Charitos EI, Stierle U, et al. Twenty-four-hour holter monitor follow-up does not provide accurate heart rhythm status after surgical atrial fibrillation ablation therapy: up to 12 months experience with a novel permanently implantable heart rhythm monitor device. *Circulation*. Sep 15 2009;120(11 Suppl):S177-84. doi:10.1161/CIRCULATIONAHA.108.838474

39. Hart RG, Pearce LA, Rothbart RM, McAnulty JH, Asinger RW, Halperin JL. Stroke with intermittent atrial fibrillation: incidence and predictors during aspirin therapy. Stroke Prevention in Atrial Fibrillation Investigators. *J Am Coll Cardiol*. Jan 2000;35(1):183-7. doi:10.1016/s0735-1097(99)00489-1

40. Health Quality O. Long-Term Continuous Ambulatory ECG Monitors and External Cardiac Loop Recorders for Cardiac Arrhythmia: A Health Technology Assessment. *Ont Health Technol Assess Ser*. 2017;17(1):1-56.

41. Heckbert SR, Austin TR, Jensen PN, et al. Yield and consistency of arrhythmia detection with patch electrocardiographic monitoring: The Multi-Ethnic Study of Atherosclerosis. *J Electrocardiol*. Nov-Dec 2018;51(6):997-1002. doi:10.1016/j.jelectrocard.2018.07.027

42. Higgins P, MacFarlane PW, Dawson J, McInnes GT, Langhorne P, Lees KR. Noninvasive cardiac event monitoring to detect atrial fibrillation after ischemic stroke: a randomized, controlled trial. *Stroke*. Sep 2013;44(9):2525-31. doi:10.1161/STROKEAHA.113.001927

43. Hindricks G, Pokushalov E, Urban L, et al. Performance of a new leadless implantable cardiac monitor in detecting and quantifying atrial fibrillation: Results of the XPECT trial. *Circ Arrhythm Electrophysiol*. Apr 2010;3(2):141-7. doi:10.1161/CIRCEP.109.877852

44. Hoefman E, Bindels PJ, van Weert HC. Efficacy of diagnostic tools for detecting cardiac arrhythmias: systematic literature search. *Neth Heart J*. Nov 2010;18(11):543-51. doi:10.1007/s12471-010-0831-0

MOBILE CARDIAC OUTPATIENT TELEMETRY

45. Hohnloser SH, Pajitnev D, Pogue J, et al. Incidence of stroke in paroxysmal versus sustained atrial fibrillation in patients taking oral anticoagulation or combined antiplatelet therapy: an ACTIVE W Substudy. *J Am Coll Cardiol*. Nov 27 2007;50(22):2156-61. doi:10.1016/j.jacc.2007.07.076

46. Israel CW, Gronefeld G, Ehrlich JR, Li YG, Hohnloser SH. Long-term risk of recurrent atrial fibrillation as documented by an implantable monitoring device: implications for optimal patient care. *J Am Coll Cardiol*. Jan 7 2004;43(1):47-52. doi:10.1016/j.jacc.2003.08.027

47. January CT, Wann LS, Alpert JS, et al. 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on practice guidelines and the Heart Rhythm Society. *Circulation*. Dec 2 2014;130(23):2071-104. doi:10.1161/CIR.0000000000000040

48. Joglar JA, Chung MK, Armbruster AL, 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. *J Am Coll Cardiol*. Jan 2 2024;83(1):109-279. doi:10.1016/j.jacc.2023.08.017

49. Joshi AK, Kowey PR, Prystowsky EN, et al. First experience with a Mobile Cardiac Outpatient Telemetry (MCOT) system for the diagnosis and management of cardiac arrhythmia. *Am J Cardiol*. Apr 1 2005;95(7):878-81. doi:10.1016/j.amjcard.2004.12.015

50. Kadish AH, Reiffel JA, Clauser J, Prater S, Menard M, Kopelman H. Frequency of serious arrhythmias detected with ambulatory cardiac telemetry. *Am J Cardiol*. May 1 2010;105(9):1313-6. doi:10.1016/j.amjcard.2009.12.047

51. Kalani R, Bernstein R, Passman R, Curran Y, Ruff I, Prabhakaran S. Low Yield of Mobile Cardiac Outpatient Telemetry after Cryptogenic Stroke in Patients with Extensive Cardiac Imaging. *J Stroke Cerebrovasc Dis*. Sep 2015;24(9):2069-73. doi:10.1016/j.jstrokecerebrovasdis.2015.05.031

52. Kamel H, Navi BB, Elijovich L, et al. Pilot randomized trial of outpatient cardiac monitoring after cryptogenic stroke. *Stroke*. Feb 2013;44(2):528-30. doi:10.1161/STROKEAHA.112.679100

53. Kapa S, Epstein AE, Callans DJ, et al. Assessing arrhythmia burden after catheter ablation of atrial fibrillation using an implantable loop recorder: the ABACUS study. *J Cardiovasc Electrophysiol*. Aug 2013;24(8):875-81. doi:10.1111/jce.12141

54. Kaura A, Sztriha L, Chan FK, et al. Early prolonged ambulatory cardiac monitoring in stroke (EPACS): an open-label randomised controlled trial. *Eur J Med Res*. Jul 26 2019;24(1):25. doi:10.1186/s40001-019-0383-8

55. Kishore A, Vail A, Majid A, et al. Detection of atrial fibrillation after ischemic stroke or transient ischemic attack: a systematic review and meta-analysis. *Stroke*. Feb 2014;45(2):520-6. doi:10.1161/STROKEAHA.113.003433

56. Krahn AD, Klein GJ, Yee R, Skanes AC. Randomized assessment of syncope trial: conventional diagnostic testing versus a prolonged monitoring strategy. *Circulation*. Jul 3 2001;104(1):46-51. doi:10.1161/01.cir.104.1.46

57. Lazzaro MA, Krishnan K, Prabhakaran S. Detection of atrial fibrillation with concurrent holter monitoring and continuous cardiac telemetry following ischemic stroke and transient ischemic attack. *J Stroke Cerebrovasc Dis*. Feb 2012;21(2):89-93. doi:10.1016/j.jstrokecerebrovasdis.2010.05.006

58. Magnusson PM, Olszowka M, Wallhagen M, Koyi H. Outcome of implantable loop recorder evaluation. *Cardiol J*. 2018;25(3):363-370. doi:10.5603/CJ.a2017.0101

59. Maines M, Zorzi A, Tomasi G, et al. Clinical impact, safety, and accuracy of the remotely monitored implantable loop recorder Medtronic Reveal LINQTM. *Europace*. Jun 1 2018;20(6):1050-1057. doi:10.1093/europace/eux187

60. Miller DJ, Khan MA, Schultz LR, et al. Outpatient cardiac telemetry detects a high rate of atrial fibrillation in cryptogenic stroke. *J Neurol Sci*. Jan 15 2013;324(1-2):57-61. doi:10.1016/j.jns.2012.10.001

61. Mittal S, Movsowitz C, Steinberg JS. Ambulatory external electrocardiographic monitoring: focus on atrial fibrillation. *J Am Coll Cardiol*. Oct 18 2011;58(17):1741-9. doi:10.1016/j.jacc.2011.07.026

62. Mittal S, Sanders P, Pokushalov E, et al. Safety Profile of a Miniaturized Insertable Cardiac Monitor: Results from Two Prospective Trials. *Pacing Clin Electrophysiol*. Dec 2015;38(12):1464-9. doi:10.1111/pace.12752

63. Moya A, Sutton R, Ammirati F, et al. Guidelines for the diagnosis and management of syncope (version 2009). *Eur Heart J*. Nov 2009;30(21):2631-71. doi:10.1093/eurheartj/ehp298

64. Mullis AH, Ayoub K, Shah J, et al. Fluctuations in premature ventricular contraction burden can affect medical assessment and management. *Heart Rhythm*. Oct 2019;16(10):1570-1574. doi:10.1016/j.hrthm.2019.04.033

65. Narasimha D, Hanna N, Beck H, et al. Validation of a smartphone-based event recorder for arrhythmia detection. *Pacing Clin Electrophysiol*. May 2018;41(5):487-494. doi:10.1111/pace.13317

66. National Institute for Health and Care Excellence (NICE). Transient loss of consciousness ('blackouts') in over 16s [CG109]. 2023. Accessed April 9, 2024. https://www.nice.org.uk/guidance/cg109

67. Nolker G, Mayer J, Boldt LH, et al. Performance of an Implantable Cardiac Monitor to Detect Atrial Fibrillation: Results of the DETECT AF Study. *J Cardiovasc Electrophysiol*. Dec 2016;27(12):1403-1410. doi:10.1111/jce.13089

MOBILE CARDIAC OUTPATIENT TELEMETRY

68. Olson JA, Fouts AM, Padanilam BJ, Prystowsky EN. Utility of mobile cardiac outpatient telemetry for the diagnosis of palpitations, presyncope, syncope, and the assessment of therapy efficacy. *J Cardiovasc Electrophysiol*. May 2007;18(5):473-7. doi:10.1111/j.1540-8167.2007.00779.x

69. Page RL, Wilkinson WE, Clair WK, McCarthy EA, Pritchett EL. Asymptomatic arrhythmias in patients with symptomatic paroxysmal atrial fibrillation and paroxysmal supraventricular tachycardia. *Circulation*. Jan 1994;89(1):224-7. doi:10.1161/01.cir.89.1.224

70. 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*. Oct 2014;107(10):546-52. doi:10.1016/j.acvd.2014.05.009

71. Pokushalov E, Romanov A, Corbucci G, et al. Ablation of paroxysmal and persistent atrial fibrillation: 1-year follow-up through continuous subcutaneous monitoring. *J Cardiovasc Electrophysiol*. Apr 2011;22(4):369-75. doi:10.1111/j.1540-8167.2010.01923.x

72. Raviele A, Giada F, Bergfeldt L, et al. Management of patients with palpitations: a position paper from the European Heart Rhythm Association. *Europace*. Jul 2011;13(7):920-34. doi:10.1093/europace/eur130

73. Reed MJ, Grubb NR, Lang CC, et al. Diagnostic yield of an ambulatory patch monitor in patients with unexplained syncope after initial evaluation in the emergency department: the PATCH-ED study. *Emerg Med J*. Aug 2018;35(8):477-485. doi:10.1136/emermed-2018-207570

74. Reiffel JA, Schwarzberg R, Murry M. Comparison of autotriggered memory loop recorders versus standard loop recorders versus 24-hour Holter monitors for arrhythmia detection. *Am J Cardiol*. May 1 2005;95(9):1055-9. doi:10.1016/j.amjcard.2005.01.025

75. Ritter MA, Kochhauser S, Duning T, et al. Occult atrial fibrillation in cryptogenic stroke: detection by 7-day electrocardiogram versus implantable cardiac monitors. *Stroke*. May 2013;44(5):1449-52. doi:10.1161/STROKEAHA.111.676189

76. Rosenberg MA, Samuel M, Thosani A, Zimetbaum PJ. Use of a noninvasive continuous monitoring device in the management of atrial fibrillation: a pilot study. *Pacing Clin Electrophysiol*. Mar 2013;36(3):328-33. doi:10.1111/pace.12053

77. Rothman SA, Laughlin JC, Seltzer J, et al. The diagnosis of cardiac arrhythmias: a prospective multi-center randomized study comparing mobile cardiac outpatient telemetry versus standard loop event monitoring. *J Cardiovasc Electrophysiol*. Mar 2007;18(3):241-7. doi:10.1111/j.1540-8167.2006.00729.x

78. Saarel EV, Doratotaj S, Sterba R. Initial experience with novel mobile cardiac outpatient telemetry for children and adolescents with suspected arrhythmia. *Congenit Heart Dis*. Jan-Feb 2008;3(1):33-8. doi:10.1111/j.1747-0803.2007.00162.x

MOBILE CARDIAC OUTPATIENT TELEMETRY

79. Sanders P, Purerfellner H, Pokushalov E, et al. Performance of a new atrial fibrillation detection algorithm in a miniaturized insertable cardiac monitor: Results from the Reveal LINQ Usability Study. *Heart Rhythm*. Jul 2016;13(7):1425-30. doi:10.1016/j.hrthm.2016.03.005

80. Sanna T, Diener HC, Passman RS, et al. Cryptogenic stroke and underlying atrial fibrillation. *N Engl J Med*. Jun 26 2014;370(26):2478-86. doi:10.1056/NEJMoa1313600

81. Savelieva I, Camm AJ. Clinical relevance of silent atrial fibrillation: prevalence, prognosis, quality of life, and management. *J Interv Card Electrophysiol*. Jun 2000;4(2):369-82. doi:10.1023/a:1009823001707

82. Schreiber D, Sattar A, Drigalla D, Higgins S. Ambulatory cardiac monitoring for discharged emergency department patients with possible cardiac arrhythmias. *West J Emerg Med*. Mar 2014;15(2):194-8. doi:10.5811/westjem.2013.11.18973

83. Shen WK, Sheldon RS, Benditt DG, 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. *J Am Coll Cardiol*. Aug 1 2017;70(5):620-663. doi:10.1016/j.jacc.2017.03.002

84. Sinha AM, Diener HC, Morillo CA, et al. Cryptogenic Stroke and underlying Atrial Fibrillation (CRYSTAL AF): design and rationale. *Am Heart J*. Jul 2010;160(1):36-41 e1. doi:10.1016/j.ahj.2010.03.032

85. Solbiati M, Casazza G, Dipaola F, et al. The diagnostic yield of implantable loop recorders in unexplained syncope: A systematic review and meta-analysis. *Int J Cardiol*. Mar 15 2017;231:170-176. doi:10.1016/j.ijcard.2016.12.128

86. Solomon MD, Yang J, Sung SH, et al. Incidence and timing of potentially high-risk arrhythmias detected through long term continuous ambulatory electrocardiographic monitoring. *BMC Cardiovasc Disord*. Feb 17 2016;16:35. doi:10.1186/s12872-016-0210-x

87. Sposato LA, Cipriano LE, Saposnik G, Ruiz Vargas E, Riccio PM, Hachinski V. Diagnosis of atrial fibrillation after stroke and transient ischaemic attack: a systematic review and meta-analysis. *Lancet Neurol*. Apr 2015;14(4):377-87. doi:10.1016/S1474-4422(15)70027-X

88. Steinberg JS, Varma N, Cygankiewicz I, et al. 2017 ISHNE-HRS expert consensus statement on ambulatory ECG and external cardiac monitoring/telemetry. *Heart Rhythm*. Jul 2017;14(7):e55-e96. doi:10.1016/j.hrthm.2017.03.038

89. Steinhubl SR, Waalen J, Edwards AM, et al. Effect of a Home-Based Wearable Continuous ECG Monitoring Patch on Detection of Undiagnosed Atrial Fibrillation: The mSToPS Randomized Clinical Trial. *JAMA*. Jul 10 2018;320(2):146-155. doi:10.1001/jama.2018.8102

MOBILE CARDIAC OUTPATIENT TELEMETRY

90. Steinhubl SR, Waalen J, Sanyal A, et al. Three year clinical outcomes in a nationwide, observational, siteless clinical trial of atrial fibrillation screening-mHealth Screening to Prevent Strokes (mSToPS). *PLoS One*. 2021;16(10):e0258276. doi:10.1371/journal.pone.0258276

91. Svendsen JH, Diederichsen SZ, Hojberg S, et al. Implantable loop recorder detection of atrial fibrillation to prevent stroke (The LOOP Study): a randomised controlled trial. *Lancet*. Oct 23 2021;398(10310):1507-1516. doi:10.1016/S0140-6736(21)01698-6

92. Tayal AH, Tian M, Kelly KM, et al. Atrial fibrillation detected by mobile cardiac outpatient telemetry in cryptogenic TIA or stroke. *Neurology*. Nov 18 2008;71(21):1696-701. doi:10.1212/01.wnl.0000325059.86313.31

93. Themistoclakis S, Corrado A, Marchlinski FE, et al. The risk of thromboembolism and need for oral anticoagulation after successful atrial fibrillation ablation. *J Am Coll Cardiol*. Feb 23 2010;55(8):735-43. doi:10.1016/j.jacc.2009.11.039

94. Tung CE, Su D, Turakhia MP, Lansberg MG. Diagnostic Yield of Extended Cardiac Patch Monitoring in Patients with Stroke or TIA. *Front Neurol*. 2014;5:266. doi:10.3389/fneur.2014.00266

95. Turakhia MP, Hoang DD, Zimetbaum P, et al. Diagnostic utility of a novel leadless arrhythmia monitoring device. *Am J Cardiol*. Aug 15 2013;112(4):520-4. doi:10.1016/j.amjcard.2013.04.017

96. Turakhia MP, Ullal AJ, Hoang DD, et al. Feasibility of extended ambulatory electrocardiogram monitoring to identify silent atrial fibrillation in high-risk patients: the Screening Study for Undiagnosed Atrial Fibrillation (STUDY-AF). *Clin Cardiol*. May 2015;38(5):285-92. doi:10.1002/clc.22387

97. Verma A, Champagne J, Sapp J, et al. Discerning the incidence of symptomatic and asymptomatic episodes of atrial fibrillation before and after catheter ablation (DISCERN AF): a prospective, multicenter study. *JAMA Intern Med*. Jan 28 2013;173(2):149-56. doi:10.1001/jamainternmed.2013.1561

98. Wineinger NE, Barrett PM, Zhang Y, et al. Identification of paroxysmal atrial fibrillation subtypes in over 13,000 individuals. *Heart Rhythm*. Jan 2019;16(1):26-30. doi:10.1016/j.hrthm.2018.08.012

99. Ziegler PD, Rogers JD, Ferreira SW, et al. Real-World Experience with Insertable Cardiac Monitors to Find Atrial Fibrillation in Cryptogenic Stroke. *Cerebrovasc Dis*. 2015;40(3-4):175-81. doi:10.1159/000439063

Coding:

CPT: 93228, 93229

EVIDENCE-BASED CRITERIA
SECTION: MEDICINE

NEXT ANNUAL REVIEW DATE: 3RD QTR 2025

ORIGINAL EFFECTIVE DATE: 11/22/23
LAST REVIEW DATE: 07/02/24
CURRENT EFFECTIVE DATE: 07/02/24
LAST CRITERIA REVISION DATE:
ARCHIVE DATE:

MOBILE CARDIAC OUTPATIENT TELEMETRY

History:	**Date**:	**Activity**:
Medical Policy Panel	07/02/24	Review with revisions
Medical Policy Panel (ad hoc)	11/22/23	Approved guideline
Medical Director (Dr. Deering)	11/20/23	Development

Policy Revisions:

07/02/24 Updated: Description section, Resources section

EVIDENCE-BASED CRITERIA
SECTION: MEDICINE

NEXT ANNUAL REVIEW DATE: 3RD QTR 2025

ORIGINAL EFFECTIVE DATE: 11/22/23
LAST REVIEW DATE: 07/02/24
CURRENT EFFECTIVE DATE: 07/02/24
LAST CRITERIA REVISION DATE:
ARCHIVE DATE:

MOBILE CARDIAC OUTPATIENT TELEMETRY

Non-Discrimination Statement:

Blue Cross Blue Shield of Arizona (BCBSAZ) complies with applicable Federal civil rights laws and does not discriminate on the basis of race, color, national origin, age, disability or sex. BCBSAZ provides appropriate free aids and services, such as qualified interpreters and written information in other formats, to people with disabilities to communicate effectively with us. BCBSAZ also provides free language services to people whose primary language is not English, such as qualified interpreters and information written in other languages. If you need these services, call (602) 864-4884 for Spanish and (877) 475-4799 for all other languages and other aids and services.

If you believe that BCBSAZ has failed to provide these services or discriminated in another way on the basis of race, color, national origin, age, disability or sex, you can file a grievance with: BCBSAZ's Civil Rights Coordinator, Attn: Civil Rights Coordinator, Blue Cross Blue Shield of Arizona, P.O. Box 13466, Phoenix, AZ 85002-3466, (602) 864-2288, TTY/TDD (602) 864-4823, crc@azblue.com. You can file a grievance in person or by mail or email. If you need help filing a grievance BCBSAZ's Civil Rights Coordinator is available to help you. You can also file a civil rights complaint with the U.S. Department of Health and Human Services, Office for Civil Rights electronically through the Office for Civil Rights Complaint Portal, available at https://ocrportal.hhs.gov/ocr/portal/lobby.jsf, or by mail or phone at: U.S. Department of Health and Human Services, 200 Independence Avenue SW., Room 509F, HHH Building, Washington, DC 20201, 1–800–368–1019, 800–537–7697 (TDD). Complaint forms are available at http://www.hhs.gov/ocr/office/file/index.html

Multi-Language Interpreter Services:

Spanish: Si usted, o alguien a quien usted está ayudando, tiene preguntas acerca de Blue Cross Blue Shield of Arizona, tiene derecho a obtener ayuda e información en su idioma sin costo alguno. Para hablar con un intérprete, llame al 602-864-4884.

Navajo: Díí kwe'é atah nílínigíí Blue Cross Blue Shield of Arizona haada yit'éego bína'ídíłkidgo éí doodago Háida bíjá anilyeedígíí t'áadoo le'é yína'ídíłkidgo beehaz'áanii hóló díí t'áá hazaadk'ehjí háká a'doowołgo bee haz'ą doo bąąh íłínígóó. Ata' halne'ígíí kojį' bich'į' hodíilnih 877-475-4799.

Chinese: 如果您，或是您正在協助的對象，有關於插入項目的名稱 Blue Cross Blue Shield of Arizona 方面的問題，您有權利免費以您的母語得到幫助和訊息。洽詢一位翻譯員，請撥電話 在此插入數字 877-475-4799。

Vietnamese: Nếu quý vị, hay người mà quý vị đang giúp đỡ, có câu hỏi về Blue Cross Blue Shield of Arizona quý vị sẽ có quyền được giúp và có thêm thông tin bằng ngôn ngữ của mình miễn phí. Để nói chuyện với một thông dịch viên, xin gọi 877-475-4799.

Arabic:
إن كان لديك أو لدى شخص تساعده أسئلة بخصوص Blue Cross Blue Shield of Arizona، فلديك الحق في الحصول على المساعدة والمعلومات الضرورية بلغتك من دون اية تكلفة. للتحدث مع مترجم اتصل ب 877-475-4799.

MOBILE CARDIAC OUTPATIENT TELEMETRY

<u>Multi-Language Interpreter Services</u>:

Tagalog: Kung ikaw, o ang iyong tinutulangan, ay may mga katanungan tungkol sa Blue Cross Blue Shield of Arizona, may karapatan ka na makakuha ng tulong at impormasyon sa iyong wika ng walang gastos. Upang makausap ang isang tagasalin, tumawag sa 877-475-4799.

Korean: 만약 귀하 또는 귀하가 돕고 있는 어떤 사람이 Blue Cross Blue Shield of Arizona 에 관해서 질문이 있다면 귀하는 그러한 도움과 정보를 귀하의 언어로 비용 부담없이 얻을 수 있는 권리가 있습니다. 그렇게 통역사와 얘기하기 위해서는 877-475-4799 로 전화하십시오.

French: Si vous, ou quelqu'un que vous êtes en train d'aider, a des questions à propos de Blue Cross Blue Shield of Arizona, vous avez le droit d'obtenir de l'aide et l'information dans votre langue à aucun coût. Pour parler à un interprète, appelez 877-475-4799.

German: Falls Sie oder jemand, dem Sie helfen, Fragen zum Blue Cross Blue Shield of Arizona haben, haben Sie das Recht, kostenlose Hilfe und Informationen in Ihrer Sprache zu erhalten. Um mit einem Dolmetscher zu sprechen, rufen Sie bitte die Nummer 877-475-4799 an.

Russian: Если у вас или лица, которому вы помогаете, имеются вопросы по поводу Blue Cross Blue Shield of Arizona, то вы имеете право на бесплатное получение помощи и информации на вашем языке. Для разговора с переводчиком позвоните по телефону 877-475-4799.

Japanese: ご本人様、またはお客様の身の回りの方でも、Blue Cross Blue Shield of Arizona についてご質問がございましたら、ご希望の言語でサポートを受けたり、情報を入手したりすることができます。料金はかかりません。通訳とお話される場合、877-475-4799 までお電話ください。

Farsi:

اگر شما، یا کسی که شما به او کمک میکنید ، سوال در مورد Blue Cross Blue Shield of Arizona ، داشته باشید حق این را دارید که کمک و اطلاعات به زبان خود را به طور رایگان دریافت نمایید 877-475-4799
[تماس حاصل نمایید.

Assyrian:

[illegible] Blue Cross Blue Shield of Arizona [illegible]
[illegible] 877-475-4799.

Serbo-Croatian: Ukoliko Vi ili neko kome Vi pomažete ima pitanje o Blue Cross Blue Shield of Arizona, imate pravo da besplatno dobijete pomoć i informacije na Vašem jeziku. Da biste razgovarali sa prevodiocem, nazovite 877-475-4799.

Thai: หากคณ หรอคนทคณกาลงชวยเหลอมคาถามเกยวกบ Blue Cross Blue Shield of Arizona
คณมสทธทจะไดรบความชวยเหลอและขอมลในภาษา ของคณไดโดยไมมคาใชจาย พดคยกบลาม โทร 877-475-4799