



MASSACHUSETTS

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Medical Policy

Signal-Averaged Electrocardiography (SAECG)

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Policy Number: 134

BCBSA Reference Number: 2.02.04 (For Plan internal use only)

NCD/LCD: N/A

Related Policies

None

Policy

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

Signal- averaged ECG (SAECG) is **INVESTIGATIONAL**, including, but not limited to, its use for the following indications:

- As a technique of risk stratification for arrhythmias after prior myocardial infarction
- In patients with cardiomyopathy
- In patients with syncope;
- As an assessment of success after surgery for arrhythmia
- In the detection of acute rejection of heart transplants
- As an assessment of efficacy of antiarrhythmic drug therapy, or
- In the assessment of success of pharmacological, mechanical, or surgical interventions to restore coronary artery blood flow.

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)	This is not a covered service.
Commercial PPO and Indemnity	This is not a covered service.

Medicare HMO Blue SM	This is not a covered service.
Medicare PPO Blue SM	This is not a covered service.

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 following CPT code is considered investigational for Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity and Medicare Advantage Members: Medicare HMO Blue and Medicare PPO Blue:

CPT Codes

CPT codes:	Code Description
93278	Signal-averaged electrocardiography (SAECG), with or without ECG

Description

Signal-averaged electrocardiography (SAECG) is a more detailed type of ECG involving computerized analysis of small segments of a standard EKG to detect abnormalities, termed ventricular late potentials (VLPs). These late-potentials are associated with delayed activation of the ventricles, and can aid in the identification of a population of patients at an increased risk for ventricular tachycardia. Therefore, VLPs, as measured by SAECG, have been investigated as a risk factor for arrhythmic events in patients with a variety of cardiac conditions, including cardiomyopathy and prior history of myocardial infarction (MI).

Patients considered at high risk of ventricular arrhythmias, and thus sudden death, may be treated with drugs to suppress the emergence of arrhythmias or implantable cardiac defibrillators to promptly detect and terminate tachyarrhythmias when they occur. Because sudden cardiac death, whether from arrhythmias or pump failure, is one of the most common causes of death after a previous MI, there is intense interest in risk stratification to target therapy.

This policy does not address other risk stratification methods, such as T-wave alternans.

Summary

Signal-averaged ECG has some ability to risk-stratify patients at risk for ventricular arrhythmias. However, this predictive ability is modest, and this technique has not been used to stratify patients into clinically relevant categories of risk. Some RCTs have used signal-averaged ECG for selection of patients at high risk of ventricular arrhythmias, but these studies have not demonstrated outcome benefits for the treatments under study. Signal-averaged ECG has also been tested as a diagnostic test for a variety of cardiac-related disorders, but the evidence is insufficient to demonstrate clinical utility for any of the conditions tested. Therefore, signal-averaged ECG has not demonstrated improvements in health outcomes and is investigational for all indications for commercial members.

Policy History

Date	Action
1/2023	Annual policy review. PA information section clarified to include Medicare.
11/2022	Annual policy review. Policy updated with literature review through October 2022. No references added. Policy statements unchanged.
1/2021	Medicare information removed. See MP #132 Medicare Advantage Management for

	local coverage determination and national coverage determination reference.
1/2020	Policy updated with literature review through January 1, 2020, references added. Policy statements unchanged.
11/2015	Clarified coding information.
5/2014	Updated Coding section with ICD10 procedure and diagnosis codes, effective 10/2015.
3/2014	Coding information clarified.
11/2011-4/2012	Medical policy ICD 10 remediation: Formatting, editing and coding updates. No changes to policy statements.
4/2011	Reviewed - Medical Policy Group - Cardiology and Pulmonology. No changes to policy statements.
4/2010	Reviewed - Medical Policy Group - Cardiology and Pulmonology. No changes to policy statements.
9/2009	Annual policy review. Changes to policy statements.
4/2009	Reviewed - Medical Policy Group - Cardiology and Pulmonology. No changes to policy statements.
4/2008	Reviewed - Medical Policy Group - Cardiology and Pulmonology. No changes to policy statements.
10/2007	Annual policy review. No changes to policy statements.
4/2007	Reviewed - Medical Policy Group - Cardiology and Pulmonology. No changes to policy statements.

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

1. Signal-averaged electrocardiography. US Department of Health and Human Services, Health Technology Assessment. 1998; Number 11(Publication No. PB98-137227).
2. Hohnloser SH KT, Zabel M. Identification of patients after myocardial infarction at risk of life-threatening arrhythmias. *Eur Heart J* 1999; 1(suppl C):C11-20.
3. Bailey JJ, Berson AS, Handelsman H et al. Utility of current risk stratification tests for predicting major arrhythmic events after myocardial infarction. *J Am Coll Cardiol* 2001; 38(7):1902-11.
4. Grimm W, Christ M, Bach J et al. Noninvasive arrhythmia risk stratification in idiopathic dilated cardiomyopathy: results of the Marburg Cardiomyopathy Study. *Circulation* 2003; 108(23):2883-91.
5. Huikuri HV, Tapanainen JM, Lindgren K et al. Prediction of sudden cardiac death after myocardial infarction in the beta-blocking era. *J Am Coll Cardiol* 2003; 42(4):652-8.
6. Bauer A, Guzik P, Barthel P et al. Reduced prognostic power of ventricular late potentials in post-infarction patients of the reperfusion era. *Eur Heart J* 2005; 26(8):755-61.
7. Touboul P. A decade of clinical trials; CAST to AVID. *Eur Heart J* 1999; 1(suppl C):C2-10.
8. Cairns JA, Connolly SJ, Roberts R et al. Randomised trial of outcome after myocardial infarction in patients with frequent or repetitive ventricular premature depolarisations: CAMIAT. Canadian Amiodarone Myocardial Infarction Arrhythmia Trial Investigators. *Lancet* 1997; 349(9053):675-82.
9. Julian DG, Camm AJ, Frangin G et al. Randomised trial of effect of amiodarone on mortality in patients with left-ventricular dysfunction after recent myocardial infarction: EMIAT. European Myocardial Infarct Amiodarone Trial Investigators. *Lancet* 1997; 349(9053):667-74.
10. Moss AJ, Hall WJ, Cannom DS et al. Improved survival with an implanted defibrillator in patients with coronary disease at high risk for ventricular arrhythmia. Multicenter Automatic Defibrillator Implantation Trial Investigators. *N Engl J Med* 1996; 335(26):1933-40.
11. Gregoratos G, Abrams J, Epstein AE et al. ACC/AHA/NASPE 2002 Guideline Update for Implantation of Cardiac Pacemakers and Antiarrhythmia Devices--summary article: a report of the American

College of Cardiology/American Heart Association Task Force on Practice Guidelines (ACC/AHA/NASPE Committee to Update the 1998 Pacemaker Guidelines). *J Am Coll Cardiol* 2002; 40(9):1703-19.

12. Bigger JT, Jr. Prophylactic use of implanted cardiac defibrillators in patients at high risk for ventricular arrhythmias after coronary-artery bypass graft surgery. *Coronary Artery Bypass Graft (CABG) Patch Trial Investigators. N Engl J Med* 1997; 337(22):1569-75.
13. Ueno A, Kobayashi Y, Yodogawa K et al. A prospective study on the risk-stratification for patients with non-sustained ventricular tachycardia using a novel algorithm. *Circ J* 2007; 71(7):1107-14.
14. Moss AJ, Zareba W, Hall WJ et al. Prophylactic implantation of a defibrillator in patients with myocardial infarction and reduced ejection fraction. *N Engl J Med* 2002; 346(12):877-83.
15. Cain ME AJ, Arnsdorf MF et al. ACC expert consensus document. Signal-averaged electrocardiography. *J Am Coll Cardiol* 1996; 27(1):238-49.
16. Kamath GS, Zareba W, Delaney J et al. Value of the signal-averaged electrocardiogram in arrhythmogenic right ventricular cardiomyopathy/dysplasia. *Heart Rhythm* 2011; 8(2):256-62.
17. Rejdak K, Rubaj A, Glowniak A et al. Analysis of ventricular late potentials in signal-averaged ECG of people with epilepsy. *Epilepsia* 2011; 52(11):2118-24.
18. Schuller JL, Lowery CM, Zipse M et al. Diagnostic utility of signal-averaged electrocardiography for detection of cardiac sarcoidosis. *Ann Noninvasive Electrocardiol* 2011; 16(1):70-6.
19. Militaru C, Donoiu I, Ionescu DD. P Wave Signal-Averaged ECG in Normal Population and in Patients with Converted Atrial Fibrillation. *Ann Noninvasive Electrocardiol* 2011; 16(4):351-6.
20. Furukawa Y, Yamada T, Okuyama Y et al. Increased intraatrial conduction abnormality assessed by P-wave signal-averaged electrocardiogram in patients with Brugada syndrome. *Pacing Clin Electrophysiol* 2011; 34(9):1138-46.
21. Zipes DP, Camm AJ, Borggrefe M et al. ACC/AHA/ESC 2006 Guidelines for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death: a report of the American College of Cardiology/American Heart Association Task Force and the European Society of Cardiology Committee for Practice Guidelines (writing committee to develop Guidelines for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death): developed in collaboration with the European Heart Rhythm Association and the Heart Rhythm Society. *Circulation* 2006; 114(10):e385-484.
22. Goldberger JJ, Cain ME, Hohnloser SH et al. AHA/ACC/Heart A scientific statement from the American Heart Association Council on Clinical Cardiology Committee on Electrocardiography and Arrhythmias and Council on Epidemiology and Prevention. *J Am Coll Cardiol* 2008; 52(14):1179-99.
23. American College of Cardiology, American Heart Association Task Force, Heart Rhythm Society. (2017). 2017 AHA/ACC/HRS guideline for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death. www.acc.org.