

Kaiser Foundation Health Plan of Washington

Clinical Review Criteria Signal-Averaged Electrocardiography (SAECG)

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Criteria

For Medicare Members

Source	Policy
CMS Coverage Manuals	None
National Coverage Determinations (NCD)	None
Local Coverage Determinations (LCD)	None
Local Coverage Article (LCA)	None
Kaiser Permanente Medical Policy	Due to the absence of an active NCD, LCD, or other coverage guidance, Kaiser Permanente has chosen to use their own Clinical Review Criteria, " <i>Signal-Averaged</i> <i>Electrocardiography (SAECG)</i> " for medical necessity determinations. Use the Non-Medicare criteria below.

For Non-Medicare Members

There is insufficient evidence in the published medical literature to show that this service/therapy is as safe as standard services/therapies and/or provides better long-term outcomes than current standard services/therapies.

If requesting review for this service, please send the following documentation:

Last 6 months of clinical notes from requesting provider &/or specialist

The following information was used in the development of this document and is provided as background only. It is provided for historical purposes and does not necessarily reflect the most current published literature. When significant new articles are published that impact treatment option, Kaiser Permanente will review as needed. This information is not to be used as coverage criteria. Please only refer to the criteria listed above for coverage determinations.

Background

Signal-averaged electrocardiography (SAECG) is a technique involving computerized analysis of small segments of a standard ECG to detect abnormalities that would be otherwise obscured by "background" skeletal muscle activity.

Sudden cardiac death (SCD) is a major health problem worldwide. It has been estimated that between 184,000 and 462,000 Americans die suddenly each year from sustained ventricular tachycardia or ventricular fibrillation. The majority have coronary artery disease and left ventricular dysfunction. Multiple large clinical trials have shown that prophylactic implantable cardioverter defibrillator (ICD) can prevent or abort these arrhythmic events and reduce mortality. It is thus critically important to identify those patients at risk to prevent potentially lethal arrhythmias (Cain 1996, Iravanian 2005, Goldberger 2008, Pandey 2010, Stein 2008).

Several invasive and noninvasive approaches or tests have been studied to stratify the patient with risk of ventricular arrhythmia and sudden death. Noninvasive methods include measurement of QRS duration on the 12-

lead ECG, measurement of heart rate variability (HRV) and baroreflex sensitivity, detection of non-sustained ventricular tachycardia; signal averaged electrocardiography (SAECG), and several others (Stein 2008).

SAECG was introduced in the 1970s primarily for the detection of patients at high risk of sudden cardiac death after myocardial infarction. It is based on the idea that most life-threatening ventricular arrhythmias are reentrant in nature among patients with structural heart disease. The arrhythmias require an area of slow conduction to allow their perpetuation. These areas of delayed conduction within the ventricular myocardium (ventricular late potentials) can often be demonstrated by invasive electrophysiological studies performed in sinus rhythm. SAECG seeks to detect the occurrence of late activation within the myocardium noninvasively via surface ECG electrodes. It involves computerized analysis of segments of a standard surface ECG to compare and average consecutive QRS complexes (usually around 300) and produce a filtered QRS complex that provides information on the presence of ventricular late potentials (Chandrasekaran 1999, Stein 2008, Liew 2010).

Medical Technology Assessment Committee (MTAC)

Signal-Averaged Electrocardiography (SAECG)

12/19/2011: MTAC REVIEW

Evidence Conclusion: In evaluating any method for risk stratification it is important to demonstrate that the test or marker can be used to select patients for a therapy or intervention that will improve outcome. Signal-averaged electrocardiography (SAECG) has been proposed as a noninvasive method for arrhythmia risk stratification. However, there is insufficient published evidence to its efficacy in establishing the risk of ventricular arrhythmias and sudden death. There is also insufficient evidence to determine clinical utility of SAECG testing in selecting patients for receiving pharmacological therapy, ICD implantation or other treatments.

<u>Articles:</u> The literature search did not identify any large prospective or randomized trials that examined the benefit of using SAECG for selecting patients for electro physiologic studies, or its clinical utility for selecting patients for prophylactic therapies and/or interventions and improving health outcomes. There was a large number of earlier studies conducted in the 1990s that examined the accuracy of SAECG and various other variables in predicting the risk of major arrhythmic events after a myocardial infarction, and a meta-analysis (Bailey 2001) that pooled the results of these studies published before 2001. The search also identified a more recent study (CARISMA study) that evaluated the ability of several invasive and noninvasive risk markers to predict arrhythmias that can potentially be treated with an ICD, and another study that compared the ability off SAECG and ejection fraction for predicting future cardiovascular events including life threatening arrhythmias in different cardiac diseases. The meta-analysis and CARISMA study were selected for critical appraisal: Bailey JJ, Berson AS, Handelsman H. Utility of current risk stratification test for predicting major arrhythmic events after myocardial infarction. *J Am Coll Cardiol* 2001; 38:1902-1911. See Evidence Table Huikuri HV, Raatikainen MJ, Moerch-Joergensen R, et al. Prediction of fatal or near-fatal cardiac arrhythmia events in patients with depressed left ventricular function after an acute myocardial infarction. *Eur Heart J.* 2009; 30:689-698. See Evidence Table

The use of SAECG does not meet the Kaiser Permanente Medical Technology Assessment Criteria.

Applicable Codes

Considered Not Medically Necessary:

CPT® Codes	Description
93278	Signal-averaged electrocardiography (SAECG), with or without ECG

*Note: Codes may not be all-inclusive. Deleted codes and codes not in effect at the time of service may not be covered.

**To verify authorization requirements for a specific code by plan type, please use the Pre-authorization Code Check.

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MDCRPC Medical Director Clinical Review and Policy Committee

MPC Medical Policy Committee

Revision History	Description
09/01/2020	Added KPWA Medical Policy statement under Medicare section