Medical Coverage Policy | Microvolt T-Wave Alternans Testing

EFFECTIVE DATE: 10|01|2026
POLICY LAST REVIEWED: 06|03|2026

OVERVIEW

Microvolt T-wave alternans (MTWA) testing has been investigated as a noninvasive test to identify a patient's risk for sudden cardiac death. The test measures the beat-to-beat microvolt variation in the amplitude of the electrocardiogram tracing. Some research indicates a positive test has a greater risk of developing ventricular tachyarrhythimas than a negative test.

MEDICAL CRITERIA

Medicare Advantage Plans
Not applicable

Commercial Products
MTWA testing using the spectral analytic method is considered medically necessary for the evaluation of persons at risk of sudden cardiac death for medically necessary implantable cardioverter-defibrillator placement.

PRIOR AUTHORIZATION

Medicare Advantage Plans
Not applicable

Commercial Products
Prior authorization is recommended for Commercial Products.

POLICY STATEMENT

Medicare Advantage Plans
MTWA testing is covered.

Note: Blue Cross & Blue Shield of Rhode Island (BCBSRI) must follow Centers for Medicare and Medicaid Services (CMS) guidelines, such as national coverage determinations or local coverage determinations for all Medicare Advantage Plans policies. Therefore, Medicare Advantage Plans policies may differ from Commercial Products. In some instances, benefits for Medicare Advantage Plans may be greater than what is allowed by the CMS.

Commercial Products
MTWA testing using the spectral analytic method is considered medically necessary when the medical criteria above is met.

MTWA testing using the spectral analytic method is considered not medically necessary when the medical criteria above is not met.

MTWA testing using the spectral analytic method is considered not medically necessary for the following indications as the evidence is insufficient to determine the effects of the technology on health outcomes:

1. Diagnosis and risk assessment of acute coronary syndrome
2. Diagnosis of reversible myocardial ischemia in individuals without structural heart disease
3. Evaluation of non-pathological preterm infants
4. Evaluation of children and adolescents with Eisenmenger syndrome

5. Evaluation of malignant ventricular arrhythmias in Chagas disease
6. Evaluation of the adequacy of medical therapy
7. Guidance of anti-arrhythmic therapy
8. Judgement of the severity of ischemic cardiomyopathy
9. Prediction of major adverse cardiac events in ischemic heart failure
10. Prediction of post-operative mortality in cardiac surgery
11. Prognosis of myocardial function in newborns with hypoxic-ischemic encephalopathy
12. Prognosis of pulmonary arterial hypertension
13. Prognostic evaluation in hypertrophic cardiomyopathy
14. Risk assessment of sudden cardiac death in children with chronic renal failure
15. Risk stratification of cardiac events (e.g., sudden cardiac death) in members following repair of tetralogy of Fallot
16. Risk stratification in Brugada syndrome
17. Tracking changes in risk during cardiac disease progression

MTWA combined with electrophysiologic study for prediction of ventricular tachyarrhythmias in individuals with arrhythmogenic right ventricular cardiomyopathy is considered not medically necessary as the evidence is insufficient to determine the effects of the technology on health outcomes.

COVERAGE

Benefits may vary between groups/contracts. Please refer to the appropriate Benefit Booklet, Evidence of Coverage or Subscriber Agreement for applicable machine tests or limitations of benefits/coverage when services are not medically necessary.

BACKGROUND

Microvolt T-wave alternans (MTWA) refers to a beat-to-beat variability in T-wave amplitude. Because a routine electrocardiogram (EKG) cannot detect these small fluctuations, this test requires specialized sensors to detect the fluctuations and computer algorithms to evaluate the results. T-wave alternans is measured by a provocative test that requires gradual elevation of the heart rate to more than 110 beats per minute. The test can be performed in conjunction with an exercise tolerance stress test. Test results are reported as the number of standard deviations (SDs) by which the peak signal of the T-wave exceeds the background noise. This number is referred to as the alternans ratio. An alternans ratio of 3 or greater is typically considered a positive result, an absent alternans ratio is considered a negative result, and other values are indeterminate.

The presence of T-wave alternans has been investigated as a risk factor for fatal arrhythmias and sudden cardiac death in patients with a history of myocardial infarction (MI), heart failure, or cardiomyopathy. Patients with these disorders at high-risk for sudden cardiac death may be treated with medications to suppress the emergence of arrhythmias or undergo implantation of cardiac defibrillators to terminate tachyarrhythmias when they occur. Since sudden cardiac death is one of the most common causes of death after a MI or in patients with dilated cardiomyopathy, there is substantial interest in risk stratification to target therapy.

Patient groups are categorized into those who have not experienced a life-threatening arrhythmia (i.e., primary prevention) and those who have (i.e., secondary prevention). Those who have experienced a life-threatening arrhythmia are already at high risk and would not be considered for testing. T-wave alternans is one of many risk factors that have been investigated for identifying candidates for primary prevention. Others include left ventricular ejection fraction (LVEF), arrhythmias detected on Holter monitor or electrophysiologic studies, heart rate variability, and baroreceptor sensitivity. Signal-averaged electrocardiography (SAECG) is another technique for risk stratification. It measures beat-averaged conduction, while T-wave alternans measures beat-to-beat variability.

MTWA testing has primarily been used for defining the risk of ventricular arrhythmias in persons at risk for sudden cardiac death and determining which patients are most likely to benefit from implantable cardioverter-defibrillators. The quality of evidence is adequate to conclude that MTWA testing using a spectral analysis

algorithm can improve net health outcomes for patients who are candidates for implantable cardioverter defibrillator (ICD) placement.

Commercial Products
There are many established tools for diagnosis, prognosis, and clinical decision making for acute coronary syndrome. Understanding the advantages and limitations of each tool according the clinical scenario is essential. Several emerging tools, such as novel biomarkers (e.g., high-sensitivity troponin and growth differential factor-15), electroencephalographic (ECG) techniques (e.g., heart rate turbulence or MTWA), and imaging modalities (computed tomography angiography and cardiac magnetic resonance) may potentially improve clinical care; however, they must be fully evaluated and validated in different scenarios and patient cohorts before they are incorporated into clinical practice. The evidence is insufficient to determine the effects of the technology on health outcomes.

Findings in one study showed that MTWA could be the new non-invasive tool for the detection of reversible ischemia in patients with suspected coronary artery disease without structural heart disease. Furthermore, MTWA can detect ischemia earlier and with greater accuracy compared with exercise ECG testing. However, this study had several drawbacks. The study was conducted on a relatively small number of patients. The research could be seen as a pilot study and encouragement for large multi-center study with a view to a definitive confirmation of criteria and values of MTWA for the diagnosis of reversible ischemia in patients without structural heart disease. The evidence is insufficient to determine the effects of the technology on health outcomes.

A preliminary retrospective study suggested that non-pathological preterm infants showed MTWA could potentially indicate a condition of cardiac risk possibly related to the low development status of the infant but further investigations are needed. The evidence is insufficient to determine the effects of the technology on health outcomes.

Studies with longer follow-up periods investigating the risks of development of sudden death and arrhythmia or cardiovascular mortality in pediatric individuals with Eisenmenger syndrome are needed to obtain definite results. The evidence is insufficient to determine the effects of the technology on health outcomes.

MTWA is a direct measure of ventricular repolarization instability and has emerged as a potentially useful way of determining arrhythmia vulnerability in members with Chagas disease. However, this methodology has not been evaluated in patients with Chagas disease. Further assessment in a prospective study is needed to establish the causality and clinical application of the test. The evidence is insufficient to determine the effects of the technology on health outcomes.

Studies have resulted in questions currently undergoing investigation, to include MTWA's potential to guide ICD implantation, track changes in risk during cardiac disease progression, and evaluate the adequacy of medical therapy. The evidence is insufficient to determine the effects of the technology on health outcomes.

MTWA represents a potential useful tool judge severity following ischemic cardiomyopathy. However, the evidence is insufficient to determine the effects of the technology on health outcomes.

The prognostic value of MTWA for the prediction of major adverse cardiac events in ischemic heart failure has not been identified to-date. The evidence is insufficient to determine the effects of the technology on health outcomes.

MTWA at the end of cardiac surgery could potentially predict in-hospital mortality. This predictability was more robust when combined with the EuroSCORE II. Additional studies on the robustness of MTWA as predictive marker in a larger cohort are needed. The evidence is insufficient to determine the effects of the technology on health outcomes.
Global cardiac functions and myocardial performance of newborns with hypoxic-ischemic encephalopathy might be improved with therapeutic hypothermia which can be determined by using MTWA and tissue-

Doppler measurements. However, further studies are needed to evaluate whether MTWA is prognostic in determining the myocardial dysfunction and arrhythmias. The evidence is insufficient to determine the effects of the technology on health outcomes.

The role of MTWA in pulmonary arterial hypertension remains obscure. Further research is needed to elucidate the clinical significance and prognostic value of MTWA. The evidence is insufficient to determine the effects of the technology on health outcomes.

For the risk assessment of sudden cardiac death in children with chronic renal failure, studies for MTWA are lacking but might be used for early risk assessment in pediatric patients with CRF in the future. The evidence is insufficient to determine the effects of the technology on health outcomes.

There is a significant risk of arrhythmia and sudden death after repair of congenital heart disease. Studies to date indicate further studies of the role of MTWA following repair of tetralogy of Fallot are needed. The evidence is insufficient to determine the effects of the technology on health outcomes.

For risk stratification in Brugada syndrome, studies were found to be hypothetical (i.e., not based on experimental data); thus, further rigorous studies are needed. The evidence is insufficient to determine the effects of the technology on health outcomes.

One study showed that the predicted value of MTWA for ventricular tachyarrhythmia in patients with arrhythmogenic right ventricular cardiomyopathy remains unclear. Despite a follow-up period as long as 8 years, this study was limited by a small sample size affiliated with a single center. The evidence is insufficient to determine the effects of the technology on health outcomes.

MTWA is associated with the occurrence of ventricular arrhythmias in several heart diseases; however, its role in HCM remains uncertain. One study showed that altered MTWA was not associated with the occurrence of SCD or potentially fatal ventricular arrhythmias in HCM patients, and the low rate of these events during long-term follow-up suggested the good prognosis of this heart disease. The evidence is insufficient to determine the effects of the technology on health outcomes.

CODING

Medicare Advantage Plans

The following code is covered:

93025 Microvolt T-wave alternans for assessment of ventricular arrhythmias

Commercial Products

The following code is covered when the medical criteria above is met:

93025 Microvolt T-wave alternans for assessment of ventricular arrhythmias

RELATED POLICIES

Prior Authorization of Services, Treatments or Procedures

PUBLISHED

Provider Update, August 2026
Provider Update, June 2025
Provider Update, April 2024
Provider Update, May 2023
Provider Update June 2022

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