



Clinical Policy: Microvolt T-Wave Alternans Testing

Reference Number: HNCA.CP.MP.212

Last Review Date: 09/19

[Coding Implications](#)
[Revision Log](#)

See [Important Reminder](#) at the end of this policy for important regulatory and legal information.

Description

Microvolt T-wave alternans (MTWA) is a subtle, beat-to-beat variability in the morphology, amplitude, and/or polarity of the T-wave portion of the heartbeat. It is detected by electrocardiographic studies that involve specialized high-resolution electrodes and computer analysis. MTWA testing requires gradual elevation of the heart rate, which is achieved by exercise, drugs, or, in some cases, atrial and ventricular pacing. This policy describes the medical necessity requirements for performing MTWA.

Policy/Criteria

- I. It is the policy of Health Net of California that MTWA with the spectral method of testing is **medically necessary** for the evaluation of patients at risk of sudden cardiac death who meet one or more of the following criteria:
 - A. Presence of unexplained syncope or pre-syncope episodes with known or suspected heart disease, abnormal EKG, occurring suddenly or with exertion, or with risk factors for coronary artery disease; or
 - B. History of syncope, pre-syncope, or complex ectopy where there is a suspicion of congenital cardiac disorder or family history of sudden death; or
 - C. Sustained ventricular tachycardia (VT) or ventricular fibrillation (VF) associated with a transient or reversible cause such as ischemia, cardiac surgery, drug overdose, etc; or
 - D. Suspected or documented non-sustained VT and left ventricular dysfunction; or
 - E. Symptomatic cardiac arrhythmias of undetermined origin.
 - F. For evaluation of persons at risk of sudden cardiac death who meet criteria for implantable cardioverter defibrillator placement.
 - G. Known or suspected long QT syndrome as part of the evaluation for diagnostic and risk stratification purposes
- II. It is the policy Health Net of California that MTWA testing is **investigational** for all other indications than those specified above, including but not limited to, use as a general assessment of patients with atherosclerotic heart disease, congestive heart failure, acute coronary syndrome, pre-surgical evaluation or other circumstances with low suspicion of VT or VF, evaluation of the adequacy of medical or anti-arrhythmic therapy or when the knowledge of possible VT/VF is not expected to alter the treatment plan.

Background

MTWA testing is proposed as a screening tool for detecting patients who are at risk for ventricular tachyarrhythmia and sudden cardiac death in order to identify patients most likely to benefit from an inserted implantable cardioverter-defibrillator (ICD). A negative MTWA test may be useful in identifying low-risk patients who are unlikely to benefit from, and who may experience worse outcomes from ICD placement.



CLINICAL POLICY

Microvolt T-Wave Alternans Testing

The test is performed by placing highly sensitive electrodes on a patient's chest prior to a period of controlled exercise. These electrodes detect tiny beat-to-beat changes, on the order of one-millionth of volt, in the EKG T-wave. Spectral analysis is used to calculate these minute voltage changes. Spectral analysis is a sensitive mathematical method of measuring and comparing time and the EKG signals. Software then analyzes these microvolt changes and produces a report to be interpreted by a physician. MTWA testing can be performed only in patients who are in sinus rhythm at the time of testing and it is not appropriate for patients with atrial fibrillation or flutter at the time of testing

The ABCD (Alternans Before Cardioverter Defibrillator) trial was a multicenter prospective study that enrolled patients with ischemic cardiomyopathy (LVEF < 0.40) and nonsustained ventricular tachycardia. All patients underwent MTWA and electrophysiological study (EPS). ICDs were mandated if either test was positive. 566 patients were followed for a median of 1.9 years. Risk stratification strategies using noninvasive MTWA versus invasive EPS were comparable at one year and complementary when applied in combination suggesting that strategies employing MTWA, EPS, or both might identify subsets of patients least likely to benefit from ICD insertion. This was the first trial to use MTWA to guide prophylactic ICD insertion.¹

American College of Cardiology/American Heart Association Task Force and the European Society of Cardiology Committee

The ACC/AHA/ESC 2006 Guidelines for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death report that based on data derived from multiple randomized clinical trials or meta-analyses, “It is reasonable to use T-wave alternans to improve the diagnosis and risk stratification of patients with ventricular arrhythmias or who are at risk for developing life-threatening ventricular arrhythmias”²

American Heart Association/American College of Cardiology Foundation/Heart Rhythm Society

A scientific statement on noninvasive risk stratification techniques for identifying patients at risk for sudden cardiac death concluded, “A moderate amount of data suggest that T-wave alternans may be useful for risk stratification for SCD. Further information will be required to determine how to implement this test in clinical practice.” They note further, “The value of T-wave alternans may be enhanced when combined with other major risk predictors”³

In 2017, the American College of Cardiology, American Heart Association Task Force, and the Heart Rhythm Society published an updated clinical practice guideline for management of individuals with ventricular arrhythmias and the prevention of SCD (Al-Khatib, 2017). The guideline states that “Data on the use of microvolt T wave alternans and the signal averaged ECG are inconclusive, as such, these tests are not routinely used in clinical practice “. Neither the American College of Cardiology nor CMS recommend withholding, based on MTWA results, an ICD from an individual meeting the criteria established in randomized clinical trials of ICD therapy (MADIT-II/SCD-HeFT)¹¹.



CLINICAL POLICY

Microvolt T-Wave Alternans Testing

Coding Implications

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CPT® Codes	Description
93025	Microvolt T-Wave Alternans for assessment of ventricular arrhythmias

HCPCS Codes	Description
N/A	

ICD-10-CM Diagnosis Codes that May Support Coverage Criteria

ICD-10-CM Code	Description
I21.01-I21.4	ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction
I22.0-I22.9	Subsequent ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction
I45.81	Long QT Syndrome
I47.0-I47.9	Paroxysmal tachycardia
I49.01-I49.9	Other cardiac arrhythmias
Q20.0-Q28.9	Congenital malformations of the circulatory system
R00.0-R00.9	Abnormalities of heart
R55	Syncope and collapse
Z82.41-Z82.49	Family history of ischemic heart disease and other diseases of the circulatory system

Reviews, Revisions, and Approvals	Date	Approval Date
Policy adopted from Health Net NMP212 Microvolt T-Wave Alternans Testing	9/16	
Added indication for those at risk for sudden death being considered for an implantable cardioverter-defibrillator. Added additional conditions under investigational	9/17	
Added G: known or suspected long QT syndrome as part of the evaluation for diagnostic and risk stratification purposes. Added references and ICD-10 code	9/18	
Updated references, no other change	9/19	9/19



CLINICAL POLICY

Microvolt T-Wave Alternans Testing

References

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2. European Heart Rhythm Association, Heart Rhythm Society, Zipes DP 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. *J Am Coll Cardiol*, 2006; 48:247-346. Available at: <http://eurheartj.oxfordjournals.org/content/ehj/27/17/2099.full.pdf>
3. Goldberger JJ, Cain ME, Hohnloser SH, et al. American Heart Association/American College of Cardiology Foundation/Heart Rhythm Society Scientific Statement on Noninvasive Risk Stratification Techniques for Identifying Patients at Risk for Sudden Cardiac Death: a scientific statement from the American Heart Association Council on Clinical Cardiology Committee on Electrocardiography and Arrhythmias and Council on Epidemiology and Prevention. *Heart Rhythm*. 2008;5(10):e1-e21. Available at: <http://circ.ahajournals.org/content/118/14/1497>
4. Hayes. Medical Technology Directory. Microvolt T-Wave Alternans to Identify Risk of Ventricular Arrhythmias and Sudden Cardiac Death. September 14, 2009. Archived October 2014
5. Daniłowicz-Szymanowicz L, Szwoch M, Dąbrowska-Kugacka A, et al. Usefulness of microvolt T-wave alternans testing in the assessment of all-cause mortality and life-threatening ventricular arrhythmia risk in patients with left ventricular dysfunction. *Arch Med Sci*. 2015 Oct 12;11(5):945-51.
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9. Schwartz, P, Ackerman M, Congenital Long QT Syndrome: Diagnosis. *UptoDate* Updated September 2017
10. Narayan, S, T wave (repolarization) alternans: Overview of technical aspects and clinical applications *UptoDate* Updated April 2018
11. 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



CLINICAL POLICY

Microvolt T-Wave Alternans Testing

Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. Heart Rhythm. 2017 Oct 30.

12. CMS National Coverage Determinations (NCDs) NCD 20.30. Microvolt T-Wave Alternans (MTWA)

Important Reminder

This clinical policy has been developed by appropriately experienced and licensed health care professionals based on a review and consideration of currently available generally accepted standards of medical practice; peer-reviewed medical literature; government agency/program approval status; evidence-based guidelines and positions of leading national health professional organizations; views of physicians practicing in relevant clinical areas affected by this clinical policy; and other available clinical information. The Health Plan makes no representations and accepts no liability with respect to the content of any external information used or relied upon in developing this clinical policy. This clinical policy is consistent with standards of medical practice current at the time that this clinical policy was approved. “Health Plan” means a health plan that has adopted this clinical policy and that is operated or administered, in whole or in part, by Centene Management Company, LLC, or any of such health plan’s affiliates, as applicable.

The purpose of this clinical policy is to provide a guide to medical necessity, which is a component of the guidelines used to assist in making coverage decisions and administering benefits. It does not constitute a contract or guarantee regarding payment or results. Coverage decisions and the administration of benefits are subject to all terms, conditions, exclusions and limitations of the coverage documents (e.g., evidence of coverage, certificate of coverage, policy, contract of insurance, etc.), as well as to state and federal requirements and applicable Health Plan-level administrative policies and procedures.

This clinical policy is effective as of the date determined by the Health Plan. The date of posting may not be the effective date of this clinical policy. This clinical policy may be subject to applicable legal and regulatory requirements relating to provider notification. If there is a discrepancy between the effective date of this clinical policy and any applicable legal or regulatory requirement, the requirements of law and regulation shall govern. The Health Plan retains the right to change, amend or withdraw this clinical policy, and additional clinical policies may be developed and adopted as needed, at any time.

This clinical policy does not constitute medical advice, medical treatment or medical care. It is not intended to dictate to providers how to practice medicine. Providers are expected to exercise professional medical judgment in providing the most appropriate care, and are solely responsible for the medical advice and treatment of members. This clinical policy is not intended to recommend treatment for members. Members should consult with their treating physician in connection with diagnosis and treatment decisions.



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CLINICAL POLICY

Microvolt T-Wave Alternans Testing

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Note: For Medicaid members, when state Medicaid coverage provisions conflict with the coverage provisions in this clinical policy, state Medicaid coverage provisions take precedence. Please refer to the state Medicaid manual for any coverage provisions pertaining to this clinical policy.

Note: For Medicare members, to ensure consistency with the Medicare National Coverage Determinations (NCD) and Local Coverage Determinations (LCD), all applicable NCDs, LCDs, and Medicare Coverage Articles should be reviewed prior to applying the criteria set forth in this clinical policy. Refer to the CMS website at <http://www.cms.gov> for additional information.

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