

Corporate Medical Policy

T-Wave Alternans

File Name:	t_wave_alternans
Origination:	6/2002
Last CAP Review:	10/2011
Next CAP Review:	10/2012
Last Review:	10/2011

Description of Procedure or Service

T-wave alternans refers to a beat-to-beat variability in the amplitude of the T-wave. A routine electrocardiogram (EKG or ECG) cannot detect these small fluctuations, and thus this test requires specialized sensors to detect the fluctuations and computer algorithms to evaluate the results. T-wave alternans is a provocative test that necessitates gradual elevation of the heart rate to above 110 beats per minute. The test can be performed in conjunction with an exercise tolerance stress test.

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, congestive heart failure, or cardiomyopathy. High-risk patients may be treated with drugs to suppress the emergence of arrhythmias or undergo implantation of cardiac defibrillators to promptly terminate tachyarrhythmias when they occur. Since sudden cardiac death is one of the most common causes of death after a myocardial infarction (MI) or in patients with dilated cardiomyopathy, there is intense interest in risk stratification to target therapy.

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

T-wave alternans has also been investigated as a diagnostic test for patients with syncope of unknown origin and as a noninvasive test to identify candidates for further invasive electrophysiology testing of the heart.

*****Note: This Medical Policy is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.**

Policy

T-wave alternans is considered investigational for all applications. BCBSNC does not provide coverage for investigational services or procedures.

Benefits Application

This medical policy relates only to the services or supplies described herein. Please refer to the Member's Benefit Booklet for availability of benefits. Member's benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this medical policy.

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When T-Wave Alternans is covered

Not Applicable

When T-Wave Alternans is not covered

T-wave alternans is considered investigational as a technique of risk stratification for primary or secondary prevention of fatal arrhythmias and sudden cardiac death in patients with a history of myocardial infarction, congestive heart failure, cardiomyopathy or other cardiac disorders such as long-QT syndrome (e.g., Brugada syndrome).

Policy Guidelines

T-wave alternans testing is a promising technique that appears to be an effective, noninvasive predictor of risk for ventricular arrhythmias and sudden death in published studies. This test appears to be comparable to invasive electrophysiologic testing but needs to be assessed in controlled clinical trials to determine whether management based on T-wave alternans findings improves the survival of patients at risk for life-threatening ventricular arrhythmias. The rationale for T-wave alternans testing is primarily that patients with a negative result will not benefit from ICD placement. Accordingly, the most convincing evidence would be obtained from a randomized trial restricted to alternans-negative patients. Such a trial is lacking.

In 2008, the AHA/American College of Cardiology (ACC) Foundation/Heart Rhythm Society published a scientific statement on noninvasive risk stratification techniques for identifying patients at risk for sudden cardiac death. The authors reported that a number of observational cohort studies have been published that suggest that T-wave alternans may work at least as well as electrophysiological testing for prediction of sudden cardiac death or major arrhythmic events. The authors concluded that, “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.”

In 2009, the American College of Cardiology Foundation (ACCF) and the American Heart Association (AHA) published a focused update to the guidelines for the diagnosis and management of heart failure in adults. In the assessment of prognosis section of the guideline the authors reported that, “Routine use of ambulatory electrocardiographic monitoring, T-wave alternans analysis, heart rate variability measurement, and signal-averaged electrocardiography have not been shown to provide incremental value in assessing overall prognosis.”

Billing/Coding/Physician Documentation Information

This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at www.bcbsnc.com. They are listed in the Category Search on the Medical Policy search page.

Applicable service codes: 93025

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

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Scientific Background and Reference Sources

BCBSA Medical Policy Reference Manual, 2.02.13, Issued 2/15/02

BCBSA Medical Policy Reference Manual, 2.02.13, 4/29/03

Specialty Matched Consultant Advisory Panel - 11/2003

Specialty Matched Consultant Advisory Panel - 11/2005

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.02.13, 4/17/07.

BCBSA TEC Assessment [Electronic Version]. May 2007.

California Technology Assessment Forum (CTAF). (October 2006) Microvolt T-Wave Alternans Testing to Risk Stratify Patients for Implantable Cardioverter-Defibrillator Placement for Prevention of Sudden Cardiac Death. Retrieved 8/17/07 from <http://www.ctaf.org/content/general/detail/622>

Harvard Pilgrim HealthCare Technology Assessment Policy (December 2006). Microvolt T-wave Alternans (MTWA). Retrieved 8/17/07 from http://www.harvardpilgrim.org/pls/portal/docs/PAGE/PROVIDERS/MEDMGMT/STATEMENTS/MI_CROVOLT_TWAVE_ALTERNANS_12.06.PDF

Zipes DP, Camm AJ, Borggrefe M, Buxton AE, Chaitman B, Fromer M, et. al. ACC/AHA/ESC 2006 guidelines 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 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;48:1064-1108

Centers for Medicare & Medicaid Services (CMS). National Coverage Determination for Microvolt T-Wave Alternans (MTWA). Manual Section Number 20.30. Retrieved 8/17/07 from <http://www.cms.hhs.gov/transmittals/downloads/R49NCD.pdf>

U.S. Food and Drug Administration (FDA). Center for Devices and Radiological Health (CDRH). Premarket Notification. 510(k) Summary. April 7, 2005. Retrieved 8/17/07 from <http://www.fda.gov/cdrh/pdf5/K050225.pdf>

Goldberger JJ, Cain ME, Hohnloser SH, et al. American Heart Association Council on Clinical Cardiology; American Heart Association Council on Epidemiology and Prevention; American College of Cardiology Foundation; Heart Rhythm Society. Scientific Statement on Noninvasive Risk Stratification Techniques for Identifying Patients at Risk for Sudden Cardiac Death

Costantini O, Hohnloser SH, Kirk et al. The ABCD (Alternans Before Cardioverter Defibrillator) Trial: strategies using T-wave alternans to improve efficiency of sudden cardiac death prevention. *J Am Coll Cardiol*. 2009 Feb 10;53(6):471-9.

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.02.13, 11/12/09

Specialty Matched Consultant Advisory Panel review 10/2010

Chan PS, Gold MR, Nallamothu BK. Do Beta-blockers impact microvolt T-wave alternans testing in patients at risk for ventricular arrhythmias? A meta-analysis. *J Cardiovasc Electrophysiol* 2010; 21(9):1009-14.

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BCBSA Medical Policy Reference Manual [Electronic Version]. 2.02.13, 02/10/11

Specialty Matched Consultant Advisory Panel review 10/2011

Policy Implementation/Update Information

6/02 Original policy issued

5/03 Changed Date of Next Review to 6/04.

11/03 Biannual policy review. Specialty Matched Consultant Advisory Panel review. No change to policy criteria. Formatting changed for consistency. Sources added. Policy reaffirmed.

11/17/05 Biennial policy review. Specialty Matched Consultant Advisory Panel review

11/07/05. No change to policy.

11/19/07 Restated "When T-Wave Alternans is Not Covered" to read: T-wave alternans is considered investigational as a technique of risk stratification for primary or secondary prevention of fatal arrhythmias and sudden cardiac death in patients with a history of myocardial infarction, congestive heart failure, cardiomyopathy or other cardiac disorders such as long-QT syndrome (e.g., Brugada syndrome). Added medical terms and definitions. Updated Policy Guidelines with rationale from BCBSA TEC Assessment. References updated. Specialty Matched Consultant Advisory Panel review meeting 10/29/07. (adn)

12/7/09 Specialty Matched Consultant Advisory Panel review 10/30/09. No change to policy statement.

6/22/10 Policy Number(s) removed (amw)

11/23/10 Specialty Matched Consultant Advisory Panel review 10/2010. Policy Guidelines updated. References updated. (mco)

4/26/11 Description section updated. Policy Guidelines updated. References updated. (mco)

11/8/11 Specialty Matched Consultant Advisory Panel review 10/2011. No changes to Policy Statement. (mco)

Medical policy is not an authorization, certification, explanation of benefits or a contract. Benefits and eligibility are determined before medical guidelines and payment guidelines are applied. Benefits are determined by the group contract and subscriber certificate that is in effect at the time services are rendered. This document is solely provided for informational purposes only and is based on research of current medical literature and review of common medical practices in the treatment and diagnosis of disease. Medical practices and knowledge are constantly changing and BCBSNC reserves the right to review and revise its medical policies periodically.