MEDICAL POLICY

POLICY TITLE	**T-WAVE ALTERNANS TESTING**
POLICY NUMBER	**MP- 2.057**

Original Issue Date (Created):	**8/23/2002**
Most Recent Review Date (Revised):	**9/14/2020**
Effective Date:	**1/1/2021**

I. POLICY

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).

There is insufficient evidence to support a conclusion concerning the health outcomes or benefits associated with this procedure.

*Primary prevention refers to patients that have *not* experienced a life-threatening arrhythmia. Secondary prevention refers to patients that have experienced a life-threatening arrhythmia.

Cross-references:

MP-1.081 Cardioverter-Defibrillators (Implantable and External)
MP-2.233 Genetic Testing for Cardiac Ion Channelopathies

II. PRODUCT VARIATIONS

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This policy is only applicable to certain programs and products administered by Capital BlueCross. Please see additional information below, and subject to benefit variations as discussed in Section VI below.

FEP PPO - Refer to FEP Benefit Brochure for information on T-Wave Alternans Testing

https://www.fepblue.org/benefit-plans/benefit-plans-brochures-and-forms

Note* - The Federal Employee Program (FEP) Service Benefit Plan does not have a medical policy related to these services.

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III. DESCRIPTION/BACKGROUND

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Microvolt T-wave alternans (MTWA) refers to a beat-to-beat variability in the 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 a provocative test that requires 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. Test results are reported as the number of standard deviations 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 anything in between is considered 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, 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 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 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 already experienced an arrhythmia are already at high risk and probably do not require 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, arrhythmias detected on Holter monitor or electrophysiologic studies, heart rate variability, and baroreceptor sensitivity. Signal-averaged electrocardiography (SAECG) is another technique for risk stratification. SAECG 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.

IV. RATIONALE

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Summary of Evidence

Microvolt T-wave alternans is one available method to risk stratify patients who may be at risk for sudden cardiac death and has been proposed to assist in selecting patients for ICD treatment. Results from prospective multicenter studies enrolling various patient populations undergoing ICD placement as part of primary prevention strategies do not support clinical utility from MTWA used to risk stratify and therefore guide placement. This conclusion, expressed in the 2006 TEC Assessment, is also supported by recent prospective studies designed to evaluate the utility of MTWA and by pooled analyses. Therefore, this technology is considered investigational.

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V. DEFINITIONS TOP

ARRHYTHMIA is an irregularity or loss of rhythm, especially of the heart**.**

CARDIOMYOPATHY refers to a disease of the myocardium (heart muscle) causing enlargement.

DEFIBRILLATOR is an electrical device that produces defibrillation of the heart. It may be used externally or in the form of an automatic implanted cardioverter defibrillator.

MYOCARDIAL INFARCTION refers to the loss of living heart muscle as a result of coronary artery occlusion.

PRIMARY PREVENTION refers to patients that have *not* experienced a life-threatening arrhythmia. Secondary prevention refers to patients that have experienced a life-threatening arrhythmia.

SECONDARY PREVENTION refers to patients that have experienced a life-threatening arrhythmia.

T WAVE is the portion of the electrical activity of the heart that reflects repolarization of the ventricles.

VI. BENEFIT VARIATIONS TOP

The existence of this medical policy does not mean that this service is a covered benefit under the member's health benefit plan. Benefit determinations should be based in all cases on the applicable health benefit plan language. Medical policies do not constitute a description of benefits. A member's health benefit plan governs which services are covered, which are excluded, which are subject to benefit limits and which require preauthorization. There are different benefit plan designs in each product administered by Capital BlueCross. Members and providers should consult the member's health benefit plan for information or contact Capital BlueCross for benefit information.

VII. DISCLAIMER TOP

Capital BlueCross's medical policies are developed to assist in administering a member's benefits, do not constitute medical advice and are subject to change. Treating providers are solely responsible for medical advice and treatment of members. Members should discuss any medical policy related to their coverage or condition with their provider and consult their benefit information to determine if the service is covered. If there is a discrepancy between this medical policy and a member's benefit information, the benefit information will govern. If a provider or a member has a question concerning the application of this medical policy to a specific member's plan of benefits, please contact Capital BlueCross' Provider Services or Member Services. Capital BlueCross considers the information contained in this medical policy to be proprietary and it may only be disseminated as permitted by law.

VIII. CODING INFORMATION TOP

Note: This list of codes may not be all-inclusive, and codes are subject to change at any time. The identification of a code in this section does not denote coverage as coverage is determined by the terms of member benefit information. In addition, not all covered services are eligible for separate reimbursement.

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Investigational; therefore not covered:

CPT Codes ®							
93025							

IX. REFERENCES

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1. *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.*
2. *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.*
3. *Buxton AE, Lee KL, Fisher JD et al. A randomized study of the prevention of sudden death in patients with coronary artery disease. Multicenter Unsustained Tachycardia Trial Investigators. N Engl J Med 1999; 341(25):1882-90.*
4. *Blue Cross and Blue Shield Association Technology Evaluation Center (TEC). Microvolt T-Wave Alternans Testing to Risk Stratify Patients Being Considered for ICD Therapy for Primary Prevention of Sudden Death. TEC Assessments 2005; Volume 20, Tab 9.*
5. *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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7. *Bloomfield DM, Steinman RC, Namerow PB et al. Microvolt T-wave alternans distinguishes between patients likely and patients not likely to benefit from implanted cardiac defibrillator therapy: a solution to the Multicenter Automatic Defibrillator Implantation Trial (MADIT) II conundrum. Circulation 2004; 110(14):1885-9.*
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9. *Chow T, Kereiakes DJ, Bartone C et al. Prognostic utility of microvolt T-wave alternans in risk stratification of patients with ischemic cardiomyopathy. J Am Coll Cardiol 2006; 47(9):1820-7.*
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11. *Calo L, De Santo T, Nuccio F et al. Predictive value of microvolt T-wave alternans for cardiac death or ventricular tachyarrhythmic events in ischemic and nonischemic cardiomyopathy patients: a meta-analysis. Ann Noninvasive Electrocardiol 2011; 16(4):388-402.*

12. *Merchant FM, Ikeda T, Pedretti RF et al. Clinical utility of microvolt T-wave alternans testing in identifying patients at high or low risk of sudden cardiac death. Heart Rhythm 2012; 9(8):1256-64 e2.*
13. *Gupta A, Hoang DD, Karliner L et al. Ability of microvolt T-wave alternans to modify risk assessment of ventricular tachyarrhythmic events: a meta-analysis. Am Heart J 2012; 163(3):354-64.*
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16. *Ellenbogen KA, Levine JH, Berger RD et al. Are implantable cardioverter defibrillator shocks a surrogate for sudden cardiac death in patients with nonischemic cardiomyopathy? Circulation 2006; 113(6):776-82.*
17. *Chow T, Kereiakes DJ, Onufer J et al. Does microvolt T-wave alternans testing predict ventricular tachyarrhythmias in patients with ischemic cardiomyopathy and prophylactic defibrillators? The MASTER (Microvolt T Wave Alternans Testing for Risk Stratification of Post-Myocardial Infarction Patients) trial. J Am Coll Cardiol 2008; 52(20):1607-15.*
18. *Greenberg H, Case RB, Moss AJ et al. Analysis of mortality events in the Multicenter Automatic Defibrillator Implantation Trial (MADIT-II). J Am Coll Cardiol 2004; 43(8):1459-65.*
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X. POLICY HISTORY

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MP 2.057	**CAC 6/24/03**
	CAC 9/13/05
	CAC 4/25/06
	CAC 4/24/07 Consensus.
	CAC 5/27/08 Consensus.
	CAC 3/31/2010 BCBSA Project.
	CAC 4/26/11 Consensus.
	CAC 6/26/12 Consensus. Policy statements unchanged, references updated. Changed FEP variation to reference to FEP Medical Policy Manual MP-2.02.13 T-Wave Alternans.
	7/29/13 Administrative update. Coding review complete.
	CAC 9/24/13 Consensus review. No change to policy statements, references reviewed.
	CAC 9/30/14 Consensus review. No change to policy statements. References reviewed. Rationale section added.
	CAC 9/29/15 Consensus review. No change to the policy statements. Reference and rationale update. FEP variation revised as policy is archived. Coding Reviewed
	CAC 9/27/2016 Consensus review. No change to the policy statements. Reference updated. Coding Reviewed. Variation reformatting.
	CAC 11/28/17 Consensus review. No change to policy statements. References and rationale updated. Coding reviewed.
	10/15/18 Consensus review. No change to policy statements. References reviewed. Rationale condensed.
	9/3/19 Consensus review. No change to policy statements. References and Summary of Evidence reviewed.
	9/14/20 Consensus review. No change to Policy Statement. Coding reviewed, no changes. References reviewed, updated. Product Variation Statement updated. FEP statement updated.

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