

Quest T-Wave Alternans

A reliable way to assess your patient's risk of Sudden Cardiac Death

Exercise
Cardiac Stress
Testing

Every year, more than 400,000 Americans die from sudden cardiac death or SCD. Microvolt T-Wave Alternans technology provides a reliable, noninvasive method for assessing risk and determining who is the best candidate for an internal cardiac defibrillator using a technology that assesses the Microvolt T-Wave at 1.9Mv in amplitude.

The Quest® exercise stress system with Microvolt T-Wave Alternans software offers physicians additional information about a patient's potential risk of sudden cardiac death. The test offers physicians the opportunity to differentiate practices with innovative and potentially life-saving technology while obtaining higher reimbursements.

According to clinical evidence, presence of Microvolt T-Wave Alternans in patients with known and/or suspected risk of ventricular tachyarrhythmia predicts increased risk of a cardiac event. Studies have shown that the Microvolt T-Wave Alternans test is comparable in predictive accuracy to electrophysiology study and better than other noninvasive markers of arrhythmia risk.



Winning business case

The Microvolt T-Wave Alternans test not only offers a lower cost, noninvasive testing option for patients; it also offers significant revenue opportunities to health care providers. Approved for reimbursement by Medicare in January 2002, tests generate a national average of \$426 in Medicare reimbursement. Private pay insurance carriers have paid significantly more for this procedure.

In November of 2001, the AMA established unique ICD 9 codes for the procedure. In 2002, the procedure was permitted to be billed as an incremental charge to a standard exercise stress test by private pay insurance.

Who needs the T-Wave test?

These are just a few examples of possible indications for a T-Wave Alternans test.

- Hypertensive heart disease
- Post myocardial infarction syndrome
- Congestive heart failure, reduced ejection fraction, or prior MI
- Coronary heart disease
- Syncope, pre-syncope, palpitations, or non-sustained VT
- Arrhythmia
- Non-ischemic dilated cardiomyopathy
- Family history of sudden death or familial condition predisposing to ventricular arrhythmias
- Pre-surgical cardiac evaluation



What is T-Wave?

Using the spectral method of analysis developed at the Massachusetts Institute for Technology and sophisticated signal-processing techniques, the Quest T-Wave diagnostic system measures Microvolt T-Wave Alternans during standard stress exercise at 1.9mV. The test can also be used with nuclear and Cardiolite studies.

Features

- Cost-effective, non-invasive diagnostic test
- Can be performed before or during the exercise stress testing
- Reimbursable by Medicare and private pay insurance
- Clinically proven technology at over 50 major medical institutions worldwide

BURDICK®

Quest T-Wave Alternans

TECHNICAL SPECIFICATIONS

General Description	Computer-based Cardiac Stress and diagnostic system. Computes Microvolt T-Wave Alternans (TWA) using the Spectral Method and other signal-processing techniques.
ECG Amplifier	Leads: 15-lead/14-electrode, high-resolution; includes standard 12-lead analysis; Sample rate: 1000 Hz; Frequency Response: DC to 250 Hz; Common mode rejection: 95 dB min. @ 60 Hz with TWA module; Input impedance: 10 Mohm min. (per ANSI/AAMI EC-11 1991); Line filter: Selectable 50/60 Hz adaptive canceller; Pacemaker detection: Detects pacemaker spikes between 0.5 ms to 2.0 ms and 2 mV to 250 mV; Defibrillation protection: Protected to 5000 V and 400 j
ECG Computations <i>(using standard 12-lead)</i>	Heart rate computation: 8-beat average, 30 to 250 bpm, updated every second; ST parameters: Level, slope (12 leads simultaneously); QRS detection channel: Lead II, V2 or V5, user-selectable; Artifact filter: Time domain filter at 40 Hz, independently selectable to screen and print output; Baseline filter: Baseline Stabilization filter reduces wander without distorting ST segment
Signal Processing	T-Wave Alternans: Computed using the Spectral Method based on (Smith, JM et al. Circulation 1988; 77: 110-21); ST-T computations: Integral, index and T-Wave Alternans computation; Median beat calculation: Incremental update of median beats including "relearn" response to gross changes in morphology and elimination of artifact and ectopic or aberrant beats
Printed Output	Printer: Inkjet printer; Alternans trend report: Displays alternans level vs. heart rate for entire study
Safety and Performance Standards	In compliance with: IEC 601-1, CSA 22.2, VDE (0871B), IEC 601-1-2, NFPA 99 and CISPR 11. Meets the American National Standards for Diagnostic Electrocardiographic Devices (ANSI/AAMI EC-11 1991) and, where applicable, for Cardiac Monitors and Heart Rate meters, and Alarms (AHA/ANSI/AAMI EC13-1992); Patient leakage: <10 microamps RMS when measured at the patient end of the patient cable

ORDERING INFORMATION

92400\1AKPT	Quest system, treadmill and Microvolt T-Wave Alternans, includes inkjet printer, printer cable, PM-3 patient module, Alternans patient cable, belt with buckle, T-wave manual and Physicians guide. (120V, English version)
040-1219-00	Microvolt T-Wave Alternans upgrade kit for existing Quest systems, includes inkjet printer, printer cable, microprocessor and memory upgrade. <i>(Requires service call and 2 hours of installation.)</i>
097014	BlueMax™ monitoring electrodes, 35 mm dia., foam
097004	BlueMax™ monitoring electrodes, 48 mm dia., foam
015-0635-00	Microvolt T-Wave Alternans electrodes (20 pouches, 7 electrodes/pouch)



Proprietary Microvolt Alternans Sensors provide the ability to sense microvolt changes while minimizing the effects of artifact on the signal.

Cardiac Stress and Microvolt T-Wave Alternans on one system

The Burdick Microvolt T-Wave Alternans system combines the proven Quest Cardiac Exercise Stress system with T-Wave Alternans. The system can be used for traditional stress testing, T-Wave Alternans or both tests simultaneously.

The T-Wave option can be part of a Quest system at time of purchase or added as an enhancement at a later date.

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Due to continued product innovations, specifications are subject to change without notice. AccuPrint, Assurance, Burdick, CardioSens, CardioVault, Eclipse and UpTime are trademarks of Burdick Inc. Microvolt T-Wave Alternans was developed by Cambridge Heart.

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