



**THORACIC ELECTRICAL BIOIMPEDANCE  
CARDIAC OUTPUT MONITORING  
HS-106**



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*Harmony Behavioral Health of Florida, Inc.*

*Harmony Health Plan of Illinois, Inc.*

*HealthEase of Florida, Inc.*

*'Ohana Health Plan, a plan offered by  
WellCare Health Insurance of Arizona, Inc.*

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*WellCare of Ohio, Inc.*

*WellCare of Texas, Inc.*

*WellCare Prescription Insurance, Inc.*

**Thoracic Electrical  
Bioimpedance Cardiac  
Output Monitoring**

**Policy Number: HS-106**

**Original Effective Date: 5/22/2009**

**Revised Date(s): 5/28/2010; 7/18/2011**

**DISCLAIMER**

The Clinical Coverage Guideline is intended to supplement certain standard WellCare benefit plans. The terms of a member's particular Benefit Plan, Evidence of Coverage, Certificate of Coverage, etc., may differ significantly from this Coverage Position. For example, a member's benefit plan may contain specific exclusions related to the topic addressed in this Clinical Coverage Guideline. When a conflict exists between the two documents, the Member's Benefit Plan always supersedes the information contained in the Clinical Coverage Guideline. Additionally, Clinical Coverage Guidelines relate exclusively to the administration of health benefit plans and are NOT recommendations for treatment, nor should they be used as treatment guidelines. The application of the Clinical Coverage Guideline is subject to the benefit determinations set forth by the Centers for Medicare and Medicaid Services (CMS) National and Local Coverage Determinations and state-specific Medicaid mandates, if any.

**APPLICATION STATEMENT**

The application of the Clinical Coverage Guideline is subject to the benefit determinations set forth by the Centers for Medicare and Medicaid Services (CMS) National and Local Coverage Determinations and state-specific Medicaid mandates, if any.

## BACKGROUND

Transthoracic electric bioimpedance (TEB), also called plethysmography or impedance cardiography (ICG), has been investigated as a noninvasive method for the measurement of cardiac output. Bioimpedance is performed by applying a small electrical current to the chest, and through electrodes placed on the neck and sides. The pulsatile flow of blood causes fluctuations in the current, and the device calculates cardiac output from the impedance waveform. Changes in the impedance of the transthoracic electric current are measured electronically, processed by a computer to calculate blood flow, and displayed in real time. The computer software typically displays cardiac data collected over the preceding seconds or minutes, which allows continuous monitoring of alterations in heart rate, cardiac output, and other cardiovascular functions.

The principal advantages of electrical bioimpedance for measurement of cardiac output are that it allows continuous monitoring and is noninvasive, without the small but definite risk associated with catheterization during thermodilution catheterization (TDC). Compared with bioimpedance cardiography, catheterization takes longer to initiate and it requires more highly skilled personnel. Cardiac output measurements are often important in critical situations, such as in hospital emergency rooms and intensive care units, where the difference in time to start bioimpedance monitoring offers a significant advantage over TDC.

## POSITION STATEMENT

Thoracic Electrical Bioimpedance (TEB) for cardiac output monitoring **is considered medically necessary** in the following circumstances:

1. Differentiation of cardiogenic from pulmonary causes of acute dyspnea when medical history, physical examination, and standard assessment tools provide insufficient information, and the treating physician has determined that TEB hemodynamic data are necessary for appropriate management of the member; **OR**,
2. Optimization of atrioventricular (A/V) interval for members with A/V sequential cardiac pacemakers when medical history, physical examination, and standard assessment tools provide insufficient information, and the treating physician has determined that TEB hemodynamic data are necessary for appropriate management of the member; **OR**,
3. Monitoring of continuous inotropic therapy for members with terminal congestive heart failure, when those members have chosen to die with comfort at home, or for members waiting at home for a heart transplant; **OR**,
4. Evaluation for rejection in members with a heart transplant as a predetermined alternative to a myocardial biopsy. Medical necessity must be documented should a biopsy be performed after TEB; **OR**,
5. Optimization of fluid management in members with congestive heart failure when medical history, physical examination, and standard assessment tools provide insufficient information, and the treating physician has determined that TEB hemodynamic data are necessary for appropriate management of the member.

TEB **is considered NOT medically necessary and NOT a covered benefit** for members:

1. With proven or suspected disease involving severe regurgitation of the aorta; **OR**,
2. With minute ventilation (MV) sensor function pacemakers, since the device may adversely affect the functioning of that type of pacemaker; **OR**,
3. During cardiac bypass surgery; **OR**,
4. In the management of all forms of hypertension

## CODING

### Covered CPT® Codes

**93701** Bioimpedance, thoracic, electrical

### Covered ICD-9-CM Procedure Codes

**89.59** Other nonoperative cardiac and vascular diagnostic procedures and vascular measurements

**HCPCS® Codes** - No applicable codes

### Covered ICD-9-CM Diagnosis Codes

**398.91** Rheumatic heart failure (congestive)  
**428.0** Congestive Heart failure; Right heart failure secondary to left heart failure  
**786.09** Other dyspnea and respiratory abnormalities  
**996.83** Complications of transplanted heart  
**V42.1** Heart replaced by transplant  
**V45.01** Atrioventricular (AV) Sequential Cardiac Pacemaker in situ  
**V53.31** Atrioventricular (AV) Sequential Cardiac Pacemaker Fitting and Adjustment

### Non-Covered ICD-9-CM Diagnosis Codes

**401.0 – 401.9** Essential Hypertension; Malignant, Benign and Unspecified  
**424.1** Aortic Valve Regurgitation  
**746.4** Congenital insufficiency of aortic valve  
**V45.01** Minute Ventilation (MV) Sensor Function Pacemakers in situ  
**V53.31** Minute Ventilation (MV) Sensor Function Pacemaker Fitting and Adjustment

\*Current Procedural Terminology (CPT) 2010 American Medical Association: Chicago, IL.®©

## REFERENCES

Peer Reviewed - N/A

### Government Agencies, Professional and Medical Organizations

- Centers for Medicare and Medicaid Services (CMS), National Coverage Determination (NCD) for Cardiac Output Monitoring by Thoracic Electrical Bioimpedance (TEB) (20.16). January 16, 2007.

## HISTORY AND REVISIONS

Date	Action
12/1/2011	• New template design approved by MPC.
7/18/2011	• Approved by MPC. No changes.