

## MVP/Preferred Care BENEFIT INTERPRETATION

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Cardiac Output Monitoring by  
Thoracic Electrical Bioimpedance

### Type of Policy

Medical

### Codes

CPT Code: 93701

### Evidence Basis for Policy

Potential but unproven benefit. Use of the technology is supported by some positive published data regarding safety and/or efficacy for the cited application(s), but a beneficial impact on health outcomes has not been proven for one of two reasons: (1) Data are sparse and the level of evidence is low, or (2) Data are inconsistent or conflicting.

### Description

Thoracic electrical bioimpedance (TEB) devices, a form of plethysmography, monitor cardiac output by non-invasively measuring hemodynamic parameters, including: stroke volume; systemic vascular resistance; and thoracic fluid status. Hemodynamic measurements of cardiac output (CO) using thoracic electrical bioimpedance (TEB) devices, relates change in thoracic electrical conductivity to changes in thoracic aortic blood volume and blood flow.

Deleted: Investigational and/or Experimental. The data on this procedure are promising but inconclusive regarding safety and/or efficacy. There is no clear medical consensus regarding its safety and/or efficacy. Coverage may be provided for selected applications based on expert opinion. Clinical outcomes data in the literature is inconclusive for improving health outcomes. The coverage of this service is based on member contract and regulatory requirements.¶

### Indications/Criteria

There are no indications supported in the medical literature.

### Exclusions/Limitations

The coverage of this service is based on member contract and regulatory requirements. Refer to Variation Section of this policy.

Deleted: Documentation Requirements ¶  
¶ The signs and symptoms related to an indicated diagnosis must be present, documented in the medical record and available upon request.¶

### Variation for Medicare Products

#### Indications/Criteria

#### Documentation Requirements

The signs and symptoms related to an indicated diagnosis must be present, documented in the medical record and available upon request.

Medical records must substantiate that the criteria in this policy are met, including a clinical diagnosis and the specific reason for the study. Such information should also document the following:

- a pertinent history and physical was done prior to the decision to test;
- test results were correlated with clinical findings; and
- testing contributed to medical decision making and treatment management.

Use of the procedure is limited to cardiologists and pulmonologists. Non-invasive diagnosis or monitoring of members with suspected or known cardiovascular disease. Bioimpedance should only be considered when medical history, physical examination, and standard assessment tools provide insufficient information, and the treating physician has determined that bioimpedance hemodynamic data is necessary for appropriate management of the patient. This indication will be limited to specific clinical situations such as:

- differentiation of cardiogenic from pulmonary causes of acute dyspnea;
- optimization of atrioventricular interval for members with A/V sequential pacemaker who have signs of dyspnea, fatigue or heart failure;
- members with terminal congestive heart failure with need of determination for intravenous inotropic therapy, when those members have chosen to die with comfort at home or for those members waiting at home for a heart transplant;
- optimization of fluid management in members with congestive heart failure; or
- evaluation for rejection in members with a heart transplant as a predetermined alternative to a myocardial biopsy. Medical necessity should be documented if a biopsy is performed after bioimpedance monitoring.

**The signs or symptoms related to the coded diagnosis must be present for the procedure to be viewed as medically necessary.**

### **Exclusions/Limitations**

~~MVP/ Preferred Care does not cover cardiac output monitoring using electrical bioimpedance for the following uses:~~

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- routine assessment of cardiac output in an asymptomatic member (i.e., a member that presents with no clinical signs or symptoms of illness or injury);
- routine assessment of hypertensive members who have had a course of combination drug therapy that has failed to control the hypertension;
- members with aortic regurgitation;
- members with minute ventilation (MV) sensor function pacemakers and bypass machine; or
- during cardiac bypass surgery.

Repeated measurements to monitor acute interventions will only be covered once per day. Cardiac output monitoring using electrical bioimpedance must be ordered by the treating physician.

Measurement of cardiac output by electrical bioimpedance is not considered medically reasonable and necessary upon each visit or each change in the member's medication.

## References

Literature (Search performed in 2008)

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1. [HealthNow UMD: Cardiac Output Monitoring by Thoracic Electrical Bioimpedance. LCD Database ID Number L3793. Update 2003. Available @ www.umd.nycpic.com/cgi-bin/bookmgr.exe/BOOKS/CV006E04/FRONT.](#) Centers for Medicare & Medicaid Services, CMS, National Determination for Thoracic Electrical Bioimpedance (TEB). Pub. 100-3, Update: 2007.
2. [HAYES Medical Technology Directory™. Electrical Bioimpedance for the Measurement of Cardiac Output. Lansdale, PA: HAYES, Inc.; ©2003 Winifred S. Hayes, Inc. Jan 8, 2003.](#)
3. [HAYES update search™. Electrical Bioimpedance for the Measurement of Cardiac Output. Lansdale, PA: HAYES, Inc.; ©2008 Winifred S. Hayes, Inc. Mar 29, 2007.](#)
4. Centers for Medicare and Medicaid Services, CMS (formerly HCFA), (2000).
5. [Cardiac output monitoring by electrical bioimpedance](#) (Coverage Issues Manual). Washington, DC. [On-Line]. 2001. Available: [www.hcfa.gov/pubforms](http://www.hcfa.gov/pubforms).
6. Belott, P. (1999). Bioimpedance in the pacemaker clinic. [AACN Clinical Issues](#), 10 (3). [On-Line]. 2001. Available: [www.aacn.org](http://www.aacn.org).
7. Pranulis, M. (2000). Impedance cardiology non-invasive hemodynamic monitoring provider an opportunity to deliver cost effective, quality care for patients with cardiovascular disorders. [The Journal of Cardiovascular Management](#), 11 (3).

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## **Review/Approval**

Medical:

Review:

Medical Advisory Team: 3/25/08

Approval

Quality Improvement Committee: 6/9/08

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**Note:** For Preferred Care authorization requirements refer to Appendix A and Appendix B in the Referral/Prior Authorization/Notification Administrative Policy. You may also refer to the "Prior Authorization of Certain Prescription Drugs" for information on drugs that require prior authorization. Both policies are available on the *easyLink* for Providers at [www.preferredcare.org](http://www.preferredcare.org).