

Electrical Bioimpedance for Cardiac Output Monitoring (BioZ)

MPM 5.4

Disclaimer

Refer to the member's specific benefit plan and *Schedule of Benefits* to determine coverage. This may not be a benefit on all plans or the plan may have broader or more limited benefits than those listed in this Medical Policy.

Description

Electrical bioimpedance measures the response of body fluids to an applied electrical current. A low level current is directed through the body and the impedance to the current flow is measured. Bioimpedance decreases as body fluid increases. There are numerous applications of electrical bioimpedance. However, this Medical Policy addresses the use of electrical bioimpedance for cardiac output monitoring.

Cardiac output determined by electrical bioimpedance, also known as thoracic electrical bioimpedance, is based upon the resistive changes in the thorax to an applied current. A special monitor is designed to measure impedance during the cardiac cycle. Since impedance changes are related to the flow of blood, both stroke volume and cardiac output can be derived. Related hemodynamic parameters such as cardiac index, index of contractility, acceleration index, thoracic fluid content and systemic vascular resistance can also be subsequently estimated.¹

**Coverage
Determination and
Clinical
Indications**

Benefit Certification is not required. However, all claims are subject to retrospective review.

This technology has been reviewed and approved by the Technology Assessment Committee and the Benefit Interpretation Committee.

Per CMS NCD 20.16, the following indications are appropriate for the use of electrical bioimpedance for cardiac output monitoring:

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 electrical bioimpedance hemodynamic data are necessary for the appropriate management of the patient.
2. Optimization of atrioventricular (A/V) interval for patients with A/V sequential cardiac pacemakers when medical history, physician examination, and standard assessment tools provide insufficient information, and the treating physician has determined that electrical bioimpedance hemodynamic data are necessary for the appropriate management of the patient.

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3. Monitoring of continuous inotropic therapy for patients with terminal congestive heart failure, when those patients have chosen to die with comfort at home, or for patients waiting at home for a heart transplant.
4. Evaluation for rejection in patients with a heart transplant as a predetermined alternative to a myocardial biopsy. Medical necessity must be documented should a biopsy be performed after electrical bioimpedance.
5. Optimization of fluid management in patients with congestive heart failure when medical history, physical examination, and standard assessment tools provide insufficient information, and the treating physician has determined that electrical bioimpedance hemodynamic data are necessary for the appropriate management of the patient.^{1,2}

Exclusions

Per CMS guidelines, electrical bioimpedance for cardiac output monitoring is **not covered** when used for patients:

1. With proven or suspected disease involving severe regurgitation of the aorta;
2. With minute ventilation sensor function pacemakers, since the device may adversely affect the functioning of that type of pacemaker;
3. During cardiac bypass surgery; or
4. In the management of all forms of hypertension, including drug-resistant hypertension.^{1,2}

Electrical bioimpedance is not covered for any indication other than cardiac output monitoring, as described above.

Coding

The coding listed in this Medical Policy is for reference only. Covered and non-covered procedures are included in this list.

CPT Codes	Description
93701	Bioimpedance, thoracic, electrical

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ICD-9© Diagnosis Codes	Description
398.91	Rheumatic heart failure (congestive)
401.0- 405.99	Hypertensive disease
425.1	Hypertrophic obstructive cardiomyopathy
425.4	Other primary cardiomyopathies
425.9	Secondary cardiomyopathy
428.0 – 428.9	Heart failure
674.50- 674.54	Peripartum cardiomyopathy
786.02	Orthopnea
786.05	Shortness of breath
786.09	Other dyspnea and respiratory abnormalities
996.83	Complications of transplanted heart
V42.1	Heart replaced by transplant
V45.01	Cardiac pacemaker in situ
V53.31	Fitting and adjustment of cardiac pacemaker

References:

1. Centers for Medicare and Medicaid Services. National Coverage Determination for Cardiac Output Monitoring by Thoracic Electrical Bioimpedance (20.16). Effective date 11-24-06. Accessed on the Internet 07-29-10 at: http://www.cms.hhs.gov/mcd/viewncd.asp?ncd_id=20.16&ncd_version=3&basket=ncd%3A20%2E16%3A3%3ACardiac+Output+Monitoring+by+Thoracic+Electrical+Bioimpedance+%28TEB%29
2. Centers for Medicare and Medicaid Services. TrailBlazer Health Enterprises, LLC. Local Coverage Determination L26495. Cardiac Output Monitoring by Thoracic Electrical Bioimpedance. Revision effective date 01-11-10. Accessed on the Internet 07-29-10 at: http://www.cms.gov/mcd/viewlcd.asp?lcd_id=26495&lcd_version=18&show=all

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Approval Signatures: **Clinical Quality Committee:** Mark Whitaker, MD**Medical Director:** Norman White, MD**Date:** July 28, 2010**Publication History:** 03-22-04: Benefit Alert, original effective date
07-21-08: Transitioned to Medical Policy
07-28-10: Review and revision

This Medical Policy is intended to represent clinical guidelines describing medical appropriateness and is developed to assist Presbyterian Health Plan and Presbyterian Insurance Company, Inc. (Presbyterian) Health Services staff and Presbyterian medical directors in determination of coverage. The Medical Policy is not a treatment guide and should not be used as such.

For those instances where a member does not meet the criteria described in these guidelines, additional information supporting medical necessity is welcome and may be utilized by the medical director in reviewing the case. Please note that all Presbyterian Medical Policies are available on the Internet at:
<http://www.phs.org/phs/healthplans/providers/healthservices/Medical/index.htm>

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