

Corporate Medical Policy

Acoustic Cardiography

File Name:	acoustic_cardiography
Origination:	8/2011
Last CAP Review:	10/2011
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Description of Procedure or Service

Acoustic cardiography is a technique that simultaneously records the electrical and acoustical aspects of the heart. By integrating the acoustic and electric properties, acoustic cardiography is intended to enhance the diagnostic ability of simple auscultation. The information from acoustic cardiography has also been used to optimize hemodynamic parameters for device placement, particularly with cardiac resynchronization therapy (CRT).

Background

Acoustic cardiography utilizes three inputs: a single EKG lead from two standard electrodes, and two audio sensors placed at the usual V3 and V4 positions on the chest. (1) These three channels synchronously record electrical and audio information. The audio information is processed using wavelet signal processing techniques and a diagnostic algorithm that filters out extraneous noise and uses time frequency analysis to objectively define the heart sounds and the intervals between sounds. An analogue visual display of the audio data is then displayed and paired with the electrical data from the EKG recording.

Output from acoustic cardiography can generate numerous parameters, some of which may have clinical applicability. Three of these measures are: 1) S3 strength - a quantitative measure of the intensity of the S3 heart sound, which is an abnormal sound that is associated with systolic dysfunction. 2) Electromechanical activation time (EMAT) defined as the interval between the onset of the QRS complex and the closure of the mitral valve. EMAT is the main parameter that is used to optimize CRT therapy by choosing the interval that optimizes cardiac output. 3) Left ventricular systolic time (LVST) - the interval between mitral valve closure and aortic valve closure. This length of the LVST has been correlated with changes in ejection fraction.

Auscultation for an S3 is part of the physical exam when evaluating for presence of heart failure. The presence of an S3 indicates systolic dysfunction, and is a specific physical exam finding supporting systolic heart failure. The S3 is an indistinct sound that can be difficult to hear, and is not present in all patients with systolic dysfunction. Other components of the diagnostic evaluation for heart failure include a variety of clinical symptoms and physical exam findings such as dyspnea, orthopnea, pulmonary rales, increased jugular venous pressure, and peripheral edema. Routine diagnostic evaluation for heart failure also includes measurement of brain natriuretic peptide (BNP), and other common laboratory measures, and a chest x-ray. A direct measure of ejection fraction by echocardiography, nuclear medicine imaging, or other imaging modalities is a crucial component of clinical evaluation for heart failure. Systolic dysfunction can be confirmed by echocardiography and/or other imaging modalities.

Optimization of CRT therapy is usually done using Doppler echocardiography. Optimization involves manipulation of the atrio-ventricular (AV) and interventricular (VV) pacemaker settings in

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order to maximize LV filling and stroke volume. Some evidence has reported that optimization improves overall clinical benefit, but this data is not uniform. Also, whether re-optimization should be performed following initial optimization is controversial, as is the timing of re-optimization if it is performed.

Regulatory Status

The Audicor™ system and electrodes received 510(k) marketing clearances from the Food and Drug Administration (FDA) for “use in acquiring, analyzing and reporting EGG and heart sounds (phonocardiograph) data and to provide interpretation of the data for consideration by physicians.”

*****Note: This Medical Policy is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.**

Policy

Acoustic Cardiography is considered investigational for all applications. BCBSNC does not provide coverage for investigational services or procedures.

Benefits Application

This medical policy relates only to the services or supplies described herein. Please refer to the Member's Benefit Booklet for availability of benefits. Member's benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this medical policy.

When Acoustic Cardiography is covered

Not applicable

When Acoustic Cardiography is not covered

Acoustic cardiography is considered investigational for the diagnosis of heart failure and for the optimization of CRT hemodynamic parameters.

Policy Guidelines

Acoustic cardiography is a technique that integrates electric and acoustic information in order to enhance the ability to detect and characterize heart sounds. Published literature has evaluated the use of acoustic cardiography in two areas: 1) as an aid in the diagnosis of heart failure, and 2) for optimization of hemodynamic parameters in patients with a CRT device.

A number of published articles support that acoustic cardiography improves the detection of an S3 compared to auscultation alone. However, there is no evidence that acoustic cardiography contributes independent predictive information when added to a standard clinical workup for heart failure that includes physical exam findings, laboratory testing, and routine imaging studies.

When used to optimize CRT settings, several studies report that acoustic cardiography has a high correlation with Doppler echocardiography. No studies have demonstrated that acoustic cardiography is superior to echocardiography for this purpose, and therefore there is no evidence that acoustic cardiography improves outcomes when used for optimization of CRT therapy.

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Billing/Coding/Physician Documentation Information

This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at www.bcbsnc.com. They are listed in the Category Search on the Medical Policy search page.

Applicable service codes: 0223T, 0224T, 0225T

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

Scientific Background and Reference Sources

Food and Drug Administration (FDA). 501(k) Summary Approval for Audicor™ Upgrade System K032145. 10/2003. Retrieved on June 10, 2011 from http://www.accessdata.fda.gov/cdrh_docs/pdf3/K032145.pdf

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.02.27, 06/09/11

Medical Director review 8/2011

Specialty Matched Consultant Advisory Panel review 10/2011

Policy Implementation/Update Information

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| 8/30/11 | New policy implemented. Acoustic cardiography is considered investigational for the diagnosis of heart failure and for the optimization of CRT hemodynamic parameters. Medical Director review 8/2011. (mco) |
| 11/8/11 | Specialty Matched Consultant Advisory Panel review 10/2011. No changes to Policy Statements. (mco) |

Medical policy is not an authorization, certification, explanation of benefits or a contract. Benefits and eligibility are determined before medical guidelines and payment guidelines are applied. Benefits are determined by the group contract and subscriber certificate that is in effect at the time services are rendered. This document is solely provided for informational purposes only and is based on research of current medical literature and review of common medical practices in the treatment and diagnosis of disease. Medical practices and knowledge are constantly changing and BCBSNC reserves the right to review and revise its medical policies periodically.