

Corporate Medical Policy

Gene Expression Testing to Predict Coronary Artery Disease

File Name:	gene_expression_testing_to_predict_coronary_artery_disease
Origination:	9/2011
Last CAP Review:	4/2012
Next CAP Review:	4/2013
Last Review:	4/2012

Description of Procedure or Service

Heart disease is the leading cause of mortality in the U.S. and together with cerebrovascular disease accounted for 31% of deaths in 2007. Individuals with signs and symptoms of obstructive coronary artery disease (CAD), the result of a chronic inflammatory process that ultimately results in progressive luminal narrowing and acute coronary syndromes, may be evaluated with a variety of tests according to prior risk. Coronary angiography is the gold standard for diagnosing obstructive CAD, but is invasive and associated with a low but finite risk of harm. Thus, coronary angiography is recommended for patients at a high prior risk of CAD according to history, physical findings, electrocardiogram, and biomarkers of cardiac injury. For patients initially assessed at low to intermediate risk, observation and noninvasive diagnostic methods, which may include imaging methods such as coronary computed tomographic angiography, may be recommended. Nevertheless, even noninvasive imaging methods have potential risks of exposure to radiation and contrast material. In addition, coronary angiography has a relatively low yield despite risk stratification recommendations. In one study of nearly 400,000 patients without known CAD undergoing elective coronary angiography, about 38% were positive for obstructive CAD (using the CAD definition, stenosis of 50% or more of the diameter of the left main coronary artery or stenosis of 70% or more of the diameter of a major epicardial or branch vessel that was more than 2.0 mm in diameter; result was 41% if using the broader definition, stenosis of 50% or more in any coronary vessel). Thus, methods of improving patient risk prediction prior to diagnostic testing are needed.

A CAD classifier has been developed based on the expression levels, in whole blood samples, of 23 genes plus patient age and sex. This information is combined in an algorithm to produce a score from 1 to 40, with higher values associated with a higher likelihood of obstructive CAD. The test is marketed as Corus CAD™ (CardioDx, Inc.). The intended population is stable, non-diabetic patients suspected of CAD either because of symptoms, a high-risk history, or a recent positive or inconclusive test result by conventional methods.

******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

Gene expression testing to predict coronary artery disease 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;

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therefore member benefit language should be reviewed before applying the terms of this medical policy.

When Gene Expression Testing for Coronary Artery Disease is covered

Not applicable

When Gene Expression Testing for Coronary Artery Disease is not covered

Gene Expression testing to predict coronary artery disease is considered investigational.

Policy Guidelines

The Corus CAD™ test is not a manufactured test kit and has not been reviewed by the U.S. Food and Drug Administration (FDA). Rather, it is a laboratory-developed test (LTD), offered by the CLIA-licensed CardioDx Commercial Laboratory.

Gene expression assays to predict the likelihood of obstructive CAD have the potential to increase the proportion of patients selected for coronary angiography that truly has disease and reduce the number of patients who might otherwise be inappropriately exposed to radiation, contrast agent, and an invasive procedure. Corus CAD was developed and validated for this purpose in non-diabetic patients. Results of initial validation studies report that the test may improve CAD prediction beyond that of simple prediction models such as Diamond-Forrester, a standard clinical risk scoring tool. However, the improvement in CAD prediction when added to routine clinical evaluation is uncertain. In particular, the impact of this test on the number of patients who get invasive testing is unclear. Furthermore, the test has only been validated in patients already selected for angiography, and has not been generalized to the more clinically relevant population of patients who are being considered for angiography.

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: There is not a specific code for this test. It would be reported with the following unlisted CPT code: 84999

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

Patel MR, Peterson ED, Dai D et al. Low diagnostic yield of elective coronary angiography. *N Engl J Med* 2010; 362(10):886-95. Retrieved on May 25, 2011 from <http://www.nejm.org/doi/full/10.1056/NEJMoa0907272>

National Institutes of Health (NIH). Clinical Trial # NCT01117506. Coronary Obstruction Detection by Molecular Personalized Gene Expression (COMPASS). Retrieved on May 24, 2011

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from <http://clinicaltrials.gov/ct2/show/NCT01117506?term=NCT01117506&rank=1>

Elashoff MR, Wingrove JA, Beineke P et al. Development of a blood-based gene expression algorithm for assessment of obstructive coronary artery disease in non-diabetic patients. BMC Med Genomics 2011; 4(1):26. Retrieved on May 25, 2011 from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3072303/?tool=pubmed>

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Medical Director review 9/2011

National Institutes of Health (NIH). Clinical Trial #01174550. Personalized Risk Evaluation and Diagnosis In the Coronary Tree (PREDICT). Retrieved March 27, 2012 from <http://clinicaltrials.gov/ct2/show/NCT00500617?term=00500617&rank=1>

Specialty Matched Consultant Advisory Panel review 4/2012

Policy Implementation/Update Information

9/30/11 New policy developed. Gene expression testing to predict coronary artery disease is considered investigational. Medical Director review 9/2011. Notice given 9/30/2011 for effective date December 30, 2011.(mco)

5/1/12 Specialty Matched Consultant Advisory Panel review 4/2012 References updated. (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.