# Improved Patterns of Diagnostic Management of Patients Using a Personalized Gene Expression Score Among Matched Cohorts of Patients Presenting to the Cardiologist with Symptoms of Suspected Obstructive Coronary Artery Disease: Results from the Understanding Clinician Utility-Cardiology Trial

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**Background:** Better methods are needed for the evaluation of stable, non-acute patients presenting with symptoms suggestive of obstructive coronary artery disease (CAD). A previously validated blood-based, gene expression diagnostic test has a negative predictive value of 96% in ruling out the diagnosis of obstructive CAD in non-diabetic patients without a history of revascularization or myocardial infarction.

**Objective:** Using a matched cohort design, the objective of this study is to evaluate the patterns of care by a cardiologist in the diagnostic management of ambulatory care patients presenting with symptoms suggestive of obstructive CAD both in usual care and after the incorporation of a personalized medicine, gene expression score (GES).

**Methods:** The Understanding Clinician Utilization-Cardiology Trial is a retrospective, matched cohort study evaluating patterns of care for patients without a history of CAD who were referred to cardiology for further work up of chest pain and/or related symptoms. GES patients were matched to historical non-GES patients by clinical factors (gender, age ±5 years, presenting symptoms). GES results were predefined as low (GES ≤15) or elevated (GES >15). The primary outcome was a comparison of management decisions between the GES cohort and the matched control group using the Fisher Exact Test.

**Results:** For primary endpoint analysis, 264 patients were eligible (132 GES patients, 132 matched controls): 146 (55%) female, median age of 51 years, and median GES of 12 (range 1-40). The GES and control groups had similar demographics and were well matched at baseline. Symptoms were evaluated as typical angina or atypical angina in 52% (129/246) and 48% (117/246) of patients, respectively. Overall, the cardiologist deferred further diagnostic testing in a greater number of patients in the GES cohort: 42% (56/132) of GES patients vs. 6% (8/132) of control patients had no further testing (p<0.001). Within the GES cohort, a low GES was noted in 58% (77/132) of patients, and the low GES patient group had more patients who did not proceed to further

diagnostic testing compared to the elevated GES patient group, 39/77 (51%) vs. 17/55 (33%), respectively(p=0.03). Notably, there was a highly significant difference in the number of patients who did not proceed to further diagnostic testing in the low GES group (39/77) vs. the matched control group (4/77) (p<0.0001).

**Conclusion:** Gene expression testing influenced the cardiologist's diagnostic work up of patients. There was a statistically significant decrease in additional diagnostic tests ordered in the GES cohort compared to a matched historical control group of patients. In conclusion, GES helped identify patients who did not require further diagnostic testing, and incorporating the GES into cardiac diagnostic clinical decision making may improve the efficiency of care in ruling out the diagnosis of obstructive CAD.

**Reference:** Kline L, Burkle J, Hoffman DA, et al. Improved Patterns of Diagnostic Management of Patients Using a Personalized Gene Expression Score Among Matched Cohorts of Patients Presenting to the Cardiologist with Symptoms of Suspected Obstructive Coronary Artery Disease: Results from the Understanding Clinician Utility-Cardiology Trial. *Circ Cardiovasc Qual Outcomes*. 2014;7.