

# Example of research paper on diagnostic tests and complementary alternative medic...

[Health & Medicine](#), [Stress](#)



## **Diagnostic tests and complementary/alternative medicines for coronary artery disease**

The diagnosis of CAD is based on the presenting manifestations, medical history, and a battery of tests. These tests are usually conducted in a systematic manner beginning with the least expensive and non-invasive ones to the more expensive and invasive ones. If the findings of one level of tests are inconclusive or abnormal, the tests in the next level of diagnostic tests are conducted. The tests utilized in the diagnosis of coronary artery disease include blood tests, stress testing, non-invasive and invasive imaging techniques. Non-invasive imaging techniques include electrocardiography, echocardiography, nuclear imaging, positron emission tomography, electronic beam computed tomography, and magnetic resonance imaging. Invasive imaging techniques used in the diagnosis of CAD encompass coronary angiography, left ventriculography, and intracoronary ultrasound (Brubaker, Kaminsky, Whaley, 2002, p. 65). A host of complimentary and/or alternative medicines (CAM) are used in the management of CAD in hospital and community settings. These therapies may be provider initiated or patient initiated. This essay will describe the various tests used in the diagnosis of CAD and CAM therapies beneficial to this patient population.

### **Stress testing**

Stress testing is aimed at inducing myocardial ischemia through exercise or pharmacological agents like dobutamine. Coronary artery disease leads to the narrowing of epicardial coronary arteries which limits coronary blood

flow. Stress testing increases the metabolic demands of myocardial tissue. In patients with coronary artery disease, increased demands for oxygen cause a cascade of ischemic events. This cascade progresses from cellular changes to mechanical changes in the function of ventricles during both systole and diastole to changes in electrical conduction detectable through ECG and eventually, to overt symptoms like angina. The events of the ischemia cascade are detected using a number of invasive and non-invasive techniques (Brubaker, Kaminsky, & Whaley, p. 67).

### **Electrocardiography**

Exercise-induced changes in the ST segment of the action potential of the heart are used to detect ischemia. The findings of ECG are interpreted together with other changes for instance, alterations in blood pressure because changes in electrical conduction of the heart occur late in the ischemic cascade. The sensitivity of the test is low although its specificity in the diagnosis of CAD is high (Brubaker, Kaminsky, & Whaley, p. 68).

### **Echocardiography**

These tests use ultrasound to examine the heart. Information is recorded in form of echoes (reflected sonic waves). Ultrasonic waves are produced by a transducer applied to the chest wall of a patient or from a tubular device put in the esophagus. The reflected sound waves return to the transducer and are processed to create an image. During exercise testing, the images are obtained before and immediately after the completion of the exercise (Brubaker, Kaminsky, and Whaley, 2002, p. 69).

## **Nuclear imaging**

In nuclear imaging, electromagnetic radiations emitted by radioisotopes administered to patients are acquired and displayed in form of a nuclear image. Nuclear imaging is used to assess myocardial perfusion. Normal cardiac cells take up the radioisotopes while ischemic ones do not. The normal cardiac cells thus appear brighter than the ischemic cardiac cells (Brubaker, Kaminsky, & Whaley, p. 69).

## **Positron Emission Tomography (PET)**

PET is used to assess myocardial blood flow and viability via the infusion of [13N] ammonia and/or [18F]-deoxyglucose. The two provide an index of metabolism of the myocardial cells and concomitantly, viability (Brubaker, Kaminsky, & Whaley, 2002, p. 70).

## **Electron beam computed tomography (EBCT)**

This test reveals the presence of calcium in coronary arteries. Calcium presence in coronary arteries is highly correlated with the extent of coronary stenosis as well as the risk for cardiac events (Brubaker, kaminsky, & Whaley, 2002, p. 71; Huang and Lauer, 2007, pp. 228).

## **Invasive diagnostic techniques**

The most reliable invasive technique in the diagnosis of CAD is coronary angiography. It is invasive because it entails the introduction of a radiographic contrast agent into the coronary arteries via a catheter inserted through the femoral artery. Cineographic equipments are then used to visualize and document images of the contrast medium as it flows through

the coronary arteries. The contrast agent is able to reveal areas where the coronary arteries are narrowed. On the other hand, ultrasonic transducers placed at the tip of a catheter provide cross-sectional images of the artery and pictures of the artery wall which enable the determination of the characteristics of any coronary artery lesions. Cardiac catheters are also used to obtain left ventriculograms (LVs). The LVs help in the determination of systolic and diastolic heart wall motion and concomitantly, ejection fraction as well as the identification of akinetic, dyskinetic, and hypokinetic areas (Brubaker, Kaminsky, & Whaley, 2002, p. 71).

Findings of studies that have examined the use of CAM by patients with CAD suggest that yoga, imagery and hypnosis, meditation, tai chi, faith and prayer, exercise, diet and dietary supplements, and music are beneficial to this group of patients. These therapies help to reduce stress, blood pressure, heart rate, sympathetic stimulation, peripheral vascular resistance, apprehension, and anxiety. Some of the therapies, for instance, yoga also help to improve cardiac output and cardiovascular endurance. Traditional dietary supplements help to reduce serum cholesterol levels (Kreitzer and Synder, 2002, p. 73).

## **Conclusion**

In summary, an array of invasive and non-invasive diagnostic tests can be used to diagnose CAD. Some of these tests are expensive and hence judicious use is warranted. These tests include stress testing, echocardiography, coronary angiography amongst others. In regard to CAM, a number of CAM therapies such as yoga, meditation, dietary supplements

amongst others are beneficial in patients with CAD. Their benefits include but are not limited to lowering serum cholesterol levels, blood pressure, heart rate, and sympathetic stimulation.

## References

- Brubaker, P. H., Kaminsky, L. A., & Whaley, M. H. (2002). Coronary artery disease: Essentials of prevention and rehabilitation programs. Windsor, ON: Human Kinetics.
- Huang, J. C., & Lauer, M. S., 2007. Electrocardiographic stress testing. In B. P. Griffin, C. M.
- Rimmerman, E. J. Topol, The Cleveland Clinic Cardiology Board review (pp. 228-240). Philadelphia, PA: Lippincott, Williams, & Wilkins.
- Kreitzer, M. J., & Synder, M. (2002). Healing the heart: Integrating complementary therapies and healing practices into the care of cardiovascular patients. *Progress in Cardiovascular Nursing*, 17, 73-80.