



Take Care of Your Heart

A new, highly accurate, risk-free inexpensive test for heart disease...

By Bonnie Arkus, RN

Hear disease is our number one killer. It accounts for more deaths each year than all forms of cancer combined. Heart disease is a huge societal burden on patients and their families as well as on the economy. According to a recent policy statement from the American Heart Association, the current cost of heart disease is \$273 billion - 17% of all health care expenditures - and that number is expected to triple by 2013.¹ There has never been a better time for a new non-invasive, accurate and risk free test to better manage heart disease. Introducing the Multifunction Cardiogram™ or “MCG”.

MCG is a revolutionary new test for diagnosing heart disease quickly, accurately and inexpensively. It can guide the physician on when more expensive riskier testing is needed. Through incorporating MCG into cardiology practices nationwide, inappropriate and unnecessary testing may be avoided, thereby saving billions of health care dollars and many lives.

The MCG machine collects the heart's electric signals with the patient at rest using a 2-lead electro-cardiac signal recorder and a computer. The combined unit resembles an oversized laptop.

Through mathematical and computer systems analysis, the MCG measures the strain on the wall of the heart muscle with the resistance between the blood flow and the myocardium. A technician places five electrodes onto the patient - one on each wrist, one on each ankle and one over the heart - to capture electrical signals from the resting heart. To obtain an accurate reading, the patient must lie completely quiet and still for four minutes. The highly sensitive MCG machine amplifies the heart signals and then transfers the digitized information over the Internet to a data center where it is compared to more than 40,000 other patient's heart signals.

In just minutes, the MCG data center generates

an automated report that is sent to the doctor's email "IN" box. The MCG report is completely objective and indicates if a patient is suffering from coronary ischemia - lack of blood flow to the heart muscle. It also provides secondary and tertiary results as well and gives valuable information like the health of the patient's heart valves, previous heart damage, arrhythmias (if present during the testing), and inflammation within the heart itself. The patient is given a disease severity score that ranges from zero to twenty, and leaves the physician's office with reliable guidance on how to proceed. An MCG severity score of ≥ 4.0 plus a qualitative MCG diagnosis of local or global ischemia are indicative of the presence of relevant coronary stenosis ($\geq 70\%$) in one or more coronary arteries. An MCG severity score between 0.0 and <4.0 is considered normal or indicative of the absence of relevant coronary stenosis ($<70\%$). Clinical guidelines are from the American Academy of Urgent Care Medicine (AAUCM).

MCG is amazingly accurate. In a recent study comparing MCG and SPECT Myocardial Perfusion Imaging for detection of relevant coronary artery stenosis ($>70\%$)², MCG correctly classified 103 of 116 patients (89%) as either having or not having coronary stenosis. SPECT nuclear

myocardial perfusion imaging was abnormal in 99 of the 116 patients undergoing cardiac catheterization (85%), but only correctly classified 54 of the 116 patients (47%) entered in the study as either having or not having relevant coronary stenosis.

MCG can be lifesaving. Here is a real-life patient scenario highlighting some of the advantages of MCG in clinical practice.

Walter A. of Trenton, New Jersey was 84-years-old when he began experiencing periodic episodes of shortness of breath. It would come and go when he was cutting the lawn, preparing his pool for the summer season or simply going up the stairs. Then one day, his shortness of breath wouldn't go away, and in fact, it became worse. That is when he made an urgent appointment to visit his primary care doctor. He was in congestive heart failure (CHF) and the ECG test indicated he had Atrial Fibrillation ("A-fib"), a rhythm disturbance that results in excessive beats and fluttering of the upper chambers of the heart. This can result in the backing up of fluid in the body and the lungs. He was placed on Lasix® - a diuretic, and advised to see a cardiologist right away. The next day, he was evaluated by a cardiologist and placed on Coumadin® - a blood thinner. The cardiologist wanted to do a stress test, but this test was contraindicated due to the severity of his CHF symptoms.

The specialist said he still needed to rule out coronary artery disease as a possible contributor to the A-fib, so after Walter's condition had stabilized for several weeks, he was admitted into the hospital to have a cardiac catheterization test - the "gold standard" for diagnosing coronary artery disease.



Cardiac catheterization involves insertion of a large catheter into the femoral artery – a major blood vessel. This can be very risky for a person taking Coumadin® due to the complication of hemorrhage. Consequently, Walter had to be first weaned from Coumadin® and placed on Heparin - a shorter-acting blood thinner, while awaiting the cardiac catheterization procedure. When Walter was wheeled to the 3rd floor surgical suite on Monday morning, there was a delay as too many patients were scheduled for the same procedure. Consequently, Walter was “bumped” and rescheduled for the next day. Stressed out, irritable and hungry, he was finally allowed some food at 4 o’clock in the afternoon. Tuesday morning, Walter was once again wheeled on a gurney to the surgical suite to have the cardiac catheterization procedure when an astute nurse noticed that Walter had a history of allergic reaction to IVP dye. “I’m sorry, Mr. A. We must have missed this. I see from the red label on the front of your chart that you are allergic to IVP dye.

We cannot do your procedure today as you must undergo a special prep with steroid medication for several days to prevent an allergic reaction from occurring with the dyes we use for cardiac catheterization,” the nurse said. Walter had reached his limit, and his only response was, “I’m signing myself out of the hospital and having an MCG test.” Walter had the MCG test completed by a consulting cardiologist that Thursday afternoon. There was no prep, no exposure to dyes or X-ray, and no invasion to the body. In 15 minutes, Walter was given his MCG score - less than 4 - indicating he didn’t have significant coronary artery disease. The cardiac catheterization was no longer needed so he could remain on his Coumadin® schedule, possibly averting a stroke. “Thanks to MCG, my doctor learned I had primary atrial fibrillation, so

he knew how best to treat me right away. That was 18 months ago. I underwent cardio-version, and I am back to my old self, though I must remain on Coumadin® probably for the rest of my life”.

TAKE CARE OF YOUR HEART

Finally, we have a risk-free non-invasive tool for diagnosing coronary artery disease with 89% accuracy – a tool that is equally effective in both women and men. MCG opens the door to wellness and prevention and can rapidly break down racial and ethnic barriers to care. It allows each of us to be proactive about our own heart health, working in true partnership with our practitioner. With MCG, heart disease can no longer hide. Soon, it will no longer be our number one killer.

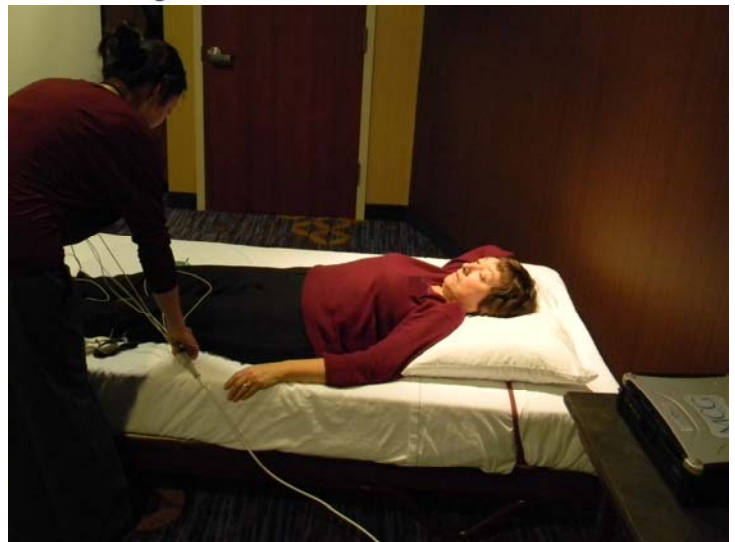


Image above is of a patient having an MCG test. Two cardiac electric signal sources are amplified, digitized, encrypted and transmitted. The Signal is sent to the Premier Heart Data Center. Decryption, signal processing with six mathematical transformations, and 166 indices are applied to each signal transformation; pattern- matching to 40,000 patients in the Premier Heart database. The Report arrives via email within 15 minutes. The practitioner reads the report. The MCG Disease Severity Score will determine the clinical path to follow. The patient leaves with clear understanding of the diagnosis and follow-up.

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1 Heidenreich PA, Trogon JG, Dhavjou OA, et al. Forecasting the future of cardiovascular disease in the United States. *Circulation* 2011; DOI:10.1181/CRI.ob013c31820a5515. Available at <http://circ.ahajournals.org>

2 Strobeck, Mangieri, Rainford, Imhoff, “A Paired-Comparison of Multifunction Cardiogram™ (MCG) and Sestamibi SPECT Myocardial Perfusion Imaging to Quantitative Coronary Angiography for the Detection of Relevant Coronary Stenosis (70%) – A Single-Center Study of 116 Consecutive Patients referred for Coronary Angiography”, poster presentation ACC Convention April 2011.

Bonnie Arkus is the founder and president of the Women’s Heart Foundation. www.WomensHeart.org. There are currently 200 MCG machines in use in the United States. For more information about MCG, go to www.PremierHeart.com