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NEW, NON-INVASIVE IMAGING TEST COULD HELP PREVENT HEART ATTACKS

Low-Dose Coronary CT Angiogram Uses Less Radiation and Helps Detect Heart Disease in Certain Asymptomatic Patients

LOS ANGELES (September 27, 2007) – Kathy Brown says she always thought that heart disease was for those who smoked cigarettes, drank, ate a lot of red meat, and who were overweight.

The 54-year old wife of an oncologist and mother of four daughters had good cholesterol levels and was a vegetarian with a healthy and active lifestyle, although she was a former smoker with a history of heart disease on her maternal side. Little did she know that the continual nausea she was experiencing was not due to the vitamins she was taking, but was a red flag for women with coronary heart disease (CHD). It nearly cost Brown her life.

She explains that although she hadn't felt well for several weeks, she didn't feel that complaining was an attractive trait and didn't want to bother with minor pains. "My life is fast-paced and I had considered myself the picture of health. I figured that everyone has aches and pain so I said to myself, 'Stop being a baby.'"

Brown's concerned husband was uncomfortable with his wife's vague complaints and sent her to see their family physician who did an electrocardiogram (EKG) that showed abnormal results. The physician then sent her over to see world-renowned cardiac imager, Dr. Daniel S. Berman M.D., FACC, chief of Cardiac Imaging and Nuclear Cardiology at Cedars-Sinai Medical Center's S. Mark Taper Foundation Imaging Center.

Berman saw her right away and ordered a stress test to evaluate the arterial blood flow to the heart muscle during physical exercise. When the heart is asked to perform increased workloads of a maximal exercise session on a treadmill, abnormalities of cardiac blood flow or function may become apparent on the EKG. Brown's initial stress test results were what Berman termed "abnormal but inconclusive."

Brown recalls, "When I finished the test, I looked at Dr. Berman and he wasn't smiling; he was looking at the numbers and I was thinking, 'Why isn't he telling me that everything is just fine?'"

Berman then ordered a stress myocardial perfusion scan in which the results were normal. Still

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hunting for the cause of Brown's abnormal EKG, he decided that she was an excellent candidate for a new procedure developed at Cedars-Sinai called the "Low-dose Coronary CT Angiogram (CTA)," an exciting new approach for certain patients.

Picking up the story, Berman says: "We decided to do a coronary CTA on Brown because she was relatively asymptomatic. We found a 90 percent blockage in the most dangerous of all locations—the left main coronary artery, which supplies about 70 percent of blood to the heart. If it gets completely blocked, the patient rarely survives. They're at a critical risk of suffering a massive heart attack and sudden death."

The coronary CTA uses advanced CT technology, along with intravenous (IV) contrast material (dye), to obtain high-resolution, three-dimensional pictures of the moving heart and large vessels, Berman explains. It is a non-invasive imaging test that can be used to determine if fatty deposits or calcium deposits have built up in the coronary arteries—the arteries that supply blood directly to the heart muscle.

Berman acknowledges that a less complex scan--the Coronary Calcium Scan not requiring any injection--is very useful when you're looking at an asymptomatic patient who may have a calcium buildup over the years. But symptoms such as chest or unexplained arm pain, nausea, indigestion, fatigue, or shortness of breath, could indicate the risk of an impending heart attack. In this circumstance the coronary CT angiogram may be useful, because a heart attack is usually caused by the rupture of non-calcified plaques that are not seen by the coronary calcium scan.

Researchers at the S. Mark Taper Foundation Imaging Center at Cedars-Sinai have also developed a way in which the coronary CTA can be used in asymptomatic patients who are concerned about radiation exposure. Their "Mini-dose CCTA" uses x-rays produced during only 1/10th of the cardiac cycle and results in 1/10th of the radiation of a full coronary CT angiograms. The cost is often less than the standard coronary CTA, because it is simpler, quicker, and less complex to interpret.

"The standard coronary calcium scan cannot visualize non-calcified plaques—plaques more prone to rupture than calcified plaques," Berman points out. "The Mini-dose CCTA assesses the amount of non-calcified plaque, potentially providing better risk assessment and an opportunity to monitor the effectiveness of therapy. Non-calcified plaques may even shrink with effective treatment."

For patients with symptoms, Cedars-Sinai Medical Center physicians have developed another low radiation approach they call "low-dose coronary CTA" as their routine. This results in a ¾ rather than a 9/10 reduction in radiation. In Brown's case, this was the test that was used, and, according to Berman, it may have saved her life. She was subsequently treated with a stent, a procedure used to keep coronary arteries expanded in patients with CAD and did not require coronary bypass surgery.

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Berman notes: "In symptomatic patients, a calcium score of even zero does not sufficiently rule out the possibility of having an obstructed coronary artery, which was the case here." Berman suggests that the coronary CTA may become the test of choice in symptomatic patients when the diagnosis is unclear.

"My heart situation was somewhat of a hidden problem, and yet it could have been 'lights out' for me at any time. I feel like I dodged a bullet. It's just miraculous that the condition was found and correctly diagnosed through this imaging technique so that it could be treated quickly and correctly," says Brown.

Some major risk factors for coronary artery disease, other than an advanced age, include the following:

- *a family history of heart disease
- *diabetes
- *high blood pressure
- *cigarette smoking or former cigarette smoking
- *inactivity and obesity
- *previous heart attack or mini stroke
- *atypical symptoms, which women are more prone to

Heart attack is the leading cause of death for American women, and the American Heart Association has reported that half of all women will eventually die of heart-related diseases. Nearly twice as many women in the United States die of heart disease, stroke and other cardiovascular diseases as from all forms of cancer, including breast cancer.

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