

# CT Angiography Effective for Low-Risk Chest Pain

*The technique quickly excluded clinically significant CAD in 67% of emergency department patients with low-risk chest pain.*

BY BRUCE JANCIN  
Denver Bureau

ATLANTA — Immediate 64-slice CT angiography in patients with low-risk acute chest pain definitively excludes significant coronary artery disease faster—and at less cost—than the standard emergency department work-up, Dr. Gilbert L. Raff said at the annual meeting of the American College of Cardiology.

He presented the results of a 200-patient randomized controlled feasibility study conducted at the William Beaumont Hospital in Royal Oak, Mich. Its positive findings have served as impetus for a more definitive 500-patient multicenter randomized trial now being organized under the auspices of the recently formed Society of Cardiovascular Computed Tomography.

In the feasibility study, 200 patients who presented to the emergency department (ED) with what was deemed by physicians to be low-risk chest pain were randomized to immediate CT angiography or the rule-out evaluation that is standard in many U.S. EDs. This includes serial cardiac enzyme measurements, ECGs, and sestamibi stress nuclear blood flow imaging.

Median time from ED admission to discharge was 12.5 hours in the CT group and 22.1 hours in patients who underwent the standard rule-out work-up. And the \$1,586 median cost of care in the CT group was nearly \$300 less than in controls. Both of these differences were statistically significant, said Dr. Raff, medical director of the cardiac CT/MRI department at William Beaumont.

CT angiography previously has been shown to have roughly a 95% negative predictive value for significant coronary artery disease (CAD). “There’s no other non-invasive test that even comes close,” the physician asserted. Dr. Raff characterized the standard rule-out evaluation for acute chest pain as “very compulsive, tedious, lengthy, time consuming, and expensive.”

“There is zero tolerance for missed coronary chest pain in the emergency medicine world. Consequently, the kind of experience patients have is quite different from what they expect. When they come to the emergency room with chest pain they would like to have an answer quickly and go home—and they don’t,” Dr. Raff explained.

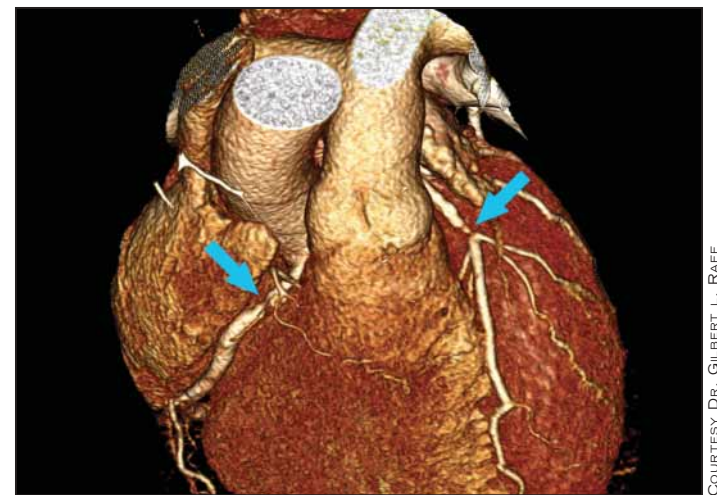
To harness the strengths of CT angiography—its speed and unparalleled negative predictive value—he and his colleagues devised a study protocol in which patients deemed not to have clinically significant CAD—meaning no luminal stenoses of 25% or greater on CT—were immediately discharged.

Those with a stenosis in excess of 70% were admitted for cardiac catheterization. And just to be safe, those with an intermediate 25%-70% stenosis also underwent stress nuclear imaging, the results of which determined whether a patient would be discharged or referred for catheterization.

CT angiography alone excluded significant CAD in 67% of patients. Another 8% were sent directly to the catheterization laboratory on the basis of their CT findings. So only one-quarter of patients in the CT study arm had to undergo a nuclear imaging study. No cardiovascular events occurred during 90 days of follow-up in patients discharged after being found not to have significant CAD.

An intriguing finding was that 9 of 12 patients who underwent cardiac catheterization on the basis of their CT findings proved to have clinically significant CAD, compared with 1 of 5 in whom the standard evaluation led to angiography.

This finding raises a key question: Does the standard rule-out work-up miss significant CAD, or does CT angiography overcall it? Investigators hope that the



Arrows indicate locations of severe stenoses in the left anterior descending artery and right coronary artery.

planned large multicenter trial will provide the answer. It has been estimated that 2%-4% of patients discharged from EDs after being told their chest pain is not of cardiac origin actually have an MI, which is why missed MI is the No. 1 cause of malpractice litigation in emergency medicine.

Until now, CT angiography has been reserved for chest-pain patients categorized as intermediate risk, but the William Beaumont study challenges that.

“If you consult the people doing research in the field, the overwhelming feeling is that because of the extremely high sensitivity and relatively low cost, CT is most appropriate in low-risk patients. A lot of patients who present with chest pain and an atypical story would have a false-positive stress test; in those cases a CT scan might be the first study to do—if further research confirms that,” Dr. Raff said.

More than 5 million Americans each year present to emergency departments with acute chest pain. The vast majority of these patients do not have significant CAD, and the estimated cost of their diagnostic work-up exceeds \$12 billion. ■

## MI Presentation Different in Kidney Disease: Only 44% Have Chest Pain

BY MARY ANN MOON  
Contributing Writer

People with kidney disease have a somewhat different symptom profile when they present with acute myocardial infarction than those without kidney disease, reported Dr. Jonathan Sosnov of Tufts–New England Medical Center, Boston, and his associates.

More patients with kidney disease die from cardiovascular causes than from any other cause. “Accurate and rapid diagnosis of MI in these high-risk patients might decrease their risk for subsequent morbidity and mortality by providing definitive treatment in a more timely manner,” the investigators said.

They reviewed data from a large, ongoing prospective epidemiologic study of MI to examine whether kidney disease might alter the symptom profile of MI, much as diabetes recently has been shown to do. They analyzed the

medical records of 4,482 patients hospitalized for MI at 11 medical centers in the Worcester, Mass., area in 1997, 1999, 2001, and 2003.

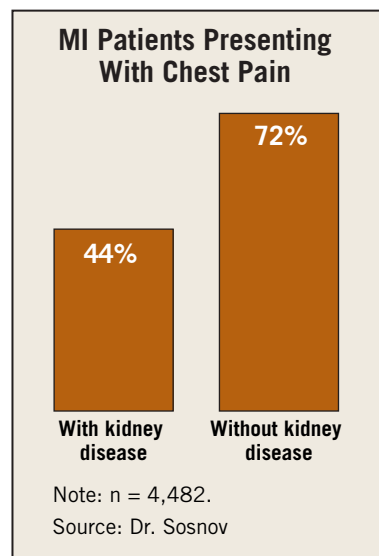
Patients with kidney disease were significantly less likely to report chest pain as their chief complaint. Only 44% presented with chest pain, compared with 72% of

patients without kidney disease, Dr. Sosnov and his associates said (*Am. J. Kidney Dis.* 2006;47:378-84). Similarly, patients with kidney disease were significantly less likely to complain of arm pain, numbness or tingling in the arm or hand, shoulder pain, jaw pain, or neck pain.

Patients with kidney disease were significantly more likely to report shortness of breath as their chief complaint. A total of 26% presented with shortness of breath, compared with only 10% of patients without kidney disease.

The reasons for these differences in presentation remain unknown and “need to be explored further, given the high incidence of [acute myocardial infarction] in patients with kidney disease,” the researchers said.

“To the best of our knowledge, this is the first report to describe how kidney disease may impact on the symptoms” of acute MI, they added. ■



## Depression in Elderly Tied To Risk of Chest Pain, Stroke, Heart Failure, MI

DENVER — Depression significantly increased the rates of four types of cardiovascular conditions among Medicare patients aged 65 and older, compared with patients without depression, Dr. Lawson R. Wulsin reported in a poster presented at the annual meeting of the American Psychosomatic Society.

Dr. Wulsin, professor of psychiatry and family medicine at the University of Cincinnati, and his colleagues reviewed data from 177,760 Medicare patients who were enrolled in the 1998 Medicare Health Outcomes Study.

Self-reported depression for at least 2 weeks during the year prior to the study was strongly associated with chest pain at rest (relative risk 2.79), myocardial infarction (RR 1.49), congestive heart failure (RR 1.81), and stroke (RR 1.78).

The significant increases in risk for these four conditions persisted when the patients reported depression or sadness either “much of the past year” or “most days during any 2 years of your life,” which suggests a similar effect for both recent and long-term depression in older patients.

The results support the need for depression screening among older patients with cardiovascular disease, and the need to identify factors that can mitigate these effects, the investigators wrote.

Their analyses of covariates including age, gender, physical and mental functioning, smoking status, and diabetes status are pending.

—Heidi Splete