

Novel Syncope Unit Speeds Diagnosis, Cuts Costs

BY BRUCE JANCIN
Denver Bureau

NEW ORLEANS — Creating a designated syncope unit in the emergency department improves diagnostic yield and dramatically reduces costly hospital admissions for this common condition, Win K. Shen, M.D., reported at the annual scientific sessions of the American Heart Association.

Cardiologists and emergency medicine specialists at the Mayo Clinic teamed up to create the novel syncope unit. Then they tested their innovation in the Syncope Evaluation in the Emergency Department Study (SEEDS), a randomized, prospective, single-center study of 103 patients with syncope. The patients were deemed to be at intermediate risk for adverse cardiovascular outcome according to American College of Emergency Physicians criteria.

Half of the SEEDS participants received routine care in the emergency department. The other half were randomized to the syncope unit, where they underwent up to 6 hours of continuous heart rhythm monitoring along with hourly orthostatic blood pressure measurements, an echocardiographic exam, carotid sinus massage with continuous blood pressure and heart rate monitoring, tilt table testing, and an electrophysiology consultation.

The primary end points in SEEDS, a

Mayo Foundation–funded trial, were diagnostic yield and hospital admission rate at the time of dismissal from the emergency department.

A presumptive diagnosis was established in 67% of patients in the syncope unit and 10% of standard-care patients. Hospital admission was required for 43% of syncope-unit patients, but 98% of those who got standard emergency department care.

Patients randomized to the syncope unit collectively spent 64 days in the hospital, compared with 140 days for the standard-treatment group. The 2-year rates of survival and freedom from recurrent syncope were similar in the two groups.

Widespread adoption of the syncope unit model in the nation's emergency departments could have a major clinical and economic impact. An estimated 5% of all emergency department visits are for evaluation of syncope, and syncope accounts for up to 6% of all urgent hospital admissions. Work-up of syncope patients, who are typically asymptomatic by the time they arrive at the emergency department, is often expensive. Indeed, syncope costs the U.S. health care system more than \$1



billion annually, according to Dr. Shen, professor of medicine at the Mayo Medical School, Rochester, Minn.

The concept behind the Mayo Clinic's syncope unit is similar to that of the chest pain evaluation units popping up in a growing number of emergency departments. Both syncope and chest pain are common presenting complaints that have numerous potential etiologies; only a minority of patients have a life-threatening condition.

Like the chest pain units, the syncope unit protocol involves a period of cardiac monitoring followed by diagnostic testing.

Discussant Eric N. Prystowsky, M.D., said he agrees with the SEEDS investigators' conclusion that the cause of most syncope can be diagnosed in the emergency department, enabling many patients to avoid the expense and inconvenience of hospitalization. But he's not convinced that a specialized syncope unit is required.

"What the patient really needs is a good doctor," argued Dr. Prystowsky, director of the clinical electrophysiology laboratory at St. Vincent Hospital, Indianapolis, and editor-in-chief of the *Journal of Cardiovascular Electrophysiology*.

"It doesn't have to be an electrophysiologist, but it has got to be someone trained in the work-up of patients with syncope. If you get a neurologist down there you will have an MRI and an EEG on every patient with neurally mediated syncope. That's not the person you want for the initial evaluation unless the patient has had documented seizures," Dr. Prystowsky said. "We ought to stop the \$20,000 work-ups and get back to basics."

The goal of the emergency department evaluation of syncope is to rule out the high-risk patient. That process starts with a careful history and physical examination and relies heavily upon a reassuring echocardiogram and ECG. It's important to realize that neurally mediated syncope and orthostatic intolerance to medications are more common than cardiac syncope, even in patients with coronary heart disease.

"If the echo shows good ventricular function and the ECG looks good and the story suggests a noncardiac syncope, I'm OK with doing the rest of the work-up on an outpatient basis. You don't have to do the tilt test right there. If you have a tilt table there, terrific, but I want to remind everybody of one thing about tilts: Do remember that people with very serious cardiac syncope that can lead to sudden death can also have a positive tilt. There have been some very famous legal cases where this has happened," he noted. ■

PET/CT Camera Boosts Cardiac Imaging

BY MITCHEL L. ZOLER
Philadelphia Bureau

NEW YORK — Cardiac PET/CT may become the best sequence for one-stop shopping in patients with known or suspected coronary artery disease, Marcelo F. Di Carli, M.D., said at the annual meeting of the American Society of Nuclear Cardiology.

Hybrid PET and CT cameras became available in 2003, but it's already clear that they are a "powerful new technique for the efficient, noninvasive, combined evaluation of coronary and cardiac anatomy, and ischemia and tissue viability," said Dr. Di Carli, chief of the division of nuclear medicine at Brigham and Women's Hospital in Boston. The cameras allow physicians to simultaneously visualize myocardial perfusion, coronary artery calcification, and atherosclerosis.

During November 2003 to April 2004, Dr. Di Carli and his associates used PET/CT to examine the hearts of 364 patients, including patients as large as 173 kg (465 pounds). The image quality produced was rated as excellent for 76% of patients

and good for another 21%. The small number of nondiagnostic PET images produced usually occurred because of patient movement, including respiratory motion.

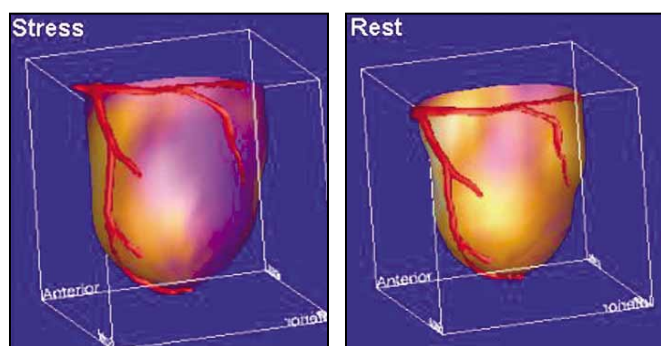
The PET tracer used in these studies was rubidium 82, a marker of myocardial perfusion. This isotope is made by a generator; a cyclotron is not needed.

The perfusion images produced by this system are superior to what's available using single-photon emission computed tomography (SPECT), and the ECG gating that's possible with PET is also superior to SPECT, Dr. Di Carli said. A major factor is that PET imaging involves an attenuation correction that "allows detection of very subtle abnormalities that would be hard to see with SPECT," he said. Another advantage of PET is that gating can be done during both stress and rest phases of imaging. The ability to gate during peak stress provides clearer images of perfusion defects.

In the series of 364 patients imaged by Dr. Di Carli and his associates, diagnostic certainty was possible for 93% of the PET examinations. Coronary angiography was later done on 52 patients. The myocardial perfusion information obtained with PET was diagnostic for coronary disease with a sensitivity of 97% and was 94% accurate in identifying normal coronary arteries. Balanced ischemia is a major source of error when using PET (or SPECT) to diagnose coronary disease because in these circumstances the perfusion image is uniform and fails to show a region of relatively reduced blood flow. But the ability to perform PET and CT simultaneously allows CT angiography and an increase in diagnostic accuracy.

A complete examination of myocardial perfusion by PET and of coronary calcium by CT can be done in an average of 35 minutes. The total radiation dose used is less than for a 1-day stress-rest scan using technetium-99m sestamibi.

Compared with coronary CT alone, the addition of PET allows instant assessment of the functional significance of coronary stenoses. "PET acts as the flow wire for CT coronary angiography," Dr. Di Carli said. This helps boost the specificity of a diagnosis of stenoses in small, distal coronary arteries. ■



PET/CT images show the heart muscle's blood supply, along with an overlay of the coronary arteries. The image on the left shows a reduction in blood flow (purple color) reaching the heart during a stress test. The image on the right shows normalization of blood flow to the heart muscle at rest (orange-yellow color).

IMAGES COURTESY DR. MARCELO F. DI CARLI

Depression Not Linked to Cardiac Autonomic Function

ORLANDO, FLA. — Cardiac autonomic nervous system function is not abnormal in older patients who have major depression, Koen G. van der Kooij, M.D., said at Wonca 2004, the conference of the World Organization of Family Doctors.

This observation dashes the hope that indicators of autonomic nervous system (ANS) function readily available on the ECG—including heart rate variability, the QT interval, and QT dispersion—might have utility in primary care practices as a means of identifying within the population of patients with major depression the subset at increased risk for cardiovascular events, said Dr. van der Kooij of VU University Medical Center, Amsterdam.

Major depression has been shown in multiple studies to increase the risk of cardiovascular morbidity and mortality. The underlying mechanism is unclear. There has been speculation that loss of normal control by the ANS is involved; however, this hypothesis wasn't borne out in Dr. van der Kooij's study of 132 patients older than 55 years who were newly diagnosed with major depression and 134 nondepressed controls.

Of the patients with depression, 34% had known CVD, as did 26% of controls. All study participants underwent a 5-minute supine ECG to assess cardiac ANS parameters.

The QT interval, heart rate variability, and QT dispersion did not differ significantly between depressed patients and controls.

—Bruce Jancin