

Sea Changes Forecast in Arrhythmia Management

With technologic advances, primary care physicians will manage patients currently seen by cardiologists.

BY BRUCE JANCIN
Denver Bureau

NEW ORLEANS — In coming years, technologic advances will allow primary care physicians to function more and more like cardiologists—and to actually take over some aspects of traditional cardiology practice, Douglas P. Zipes, M.D., predicted at the annual meeting of the Heart Rhythm Society.

This turf reconfiguration will likely come about due to looming technologic advances, including genomic screening for susceptibility to sudden cardiac death, noninvasive mapping of the heart to pinpoint the site of ventricular tachycardia or accessory pathways, noninvasive autonomic imaging of sympathetic innervation of the heart, and vagal imaging of the ventricle.

The primary care physician caring for a patient with, say, chest pain, will be able to order these noninvasive tests much like ordering a chest x-ray. Armed with the results and with detailed practice guidelines, this physician will probably be able to manage an increasing number of patients without need for cardiology referral, according to Dr. Zipes, former president of

the Heart Rhythm Society and the American College of Cardiology.

"In the future, this may well affect the whole paradigm of how we take care of patients. We've seen some of this already in cardiovascular surgery, as we the interventional cardiologists or electrophysiologists have usurped the cardiothoracic surgeons by our use of catheters for electrophysiologic studies and stenting," said Dr. Zipes, distinguished professor emeritus of medicine, Indiana University, Indianapolis.

Cardiologists needn't worry, though; they have job security well into the future. That's because with the aging of the American population, the prevalence of three major forms of cardiovascular disease—atrial fibrillation, heart failure, and sudden cardiac arrest—is expected to at least double in the next 25 years. There will be plenty of work for all, he continued.

Among his other predictions for arrhythmia management over the next 5-10 years, and in some cases beyond, were:

► **A fork in the road for implantable cardioverter defibrillators.** For years, ICDs have been growing more complex. That will continue. Some will soon be capable of monitoring comorbid conditions such

as heart failure, diabetes, and atrial fibrillation. But payer pressures will force device manufacturers to also offer very simple bare-bones ICDs.

"We're at a branch point with implantable devices. In the future, one size will no longer fit all." Dr. Zipes said.

► **More remote patient management.** All of the major implantable device manufacturers have developed their own proprietary systems for remote patient monitoring and device reprogramming. "I call this the outpatient coronary care unit, where we'll be able to manage arrhythmic conditions and comorbidities and have access to continuous monitoring data."

► **Noninvasive arrhythmia ablation.** Gynecologists have blazed the trail here. The Food and Drug Administration-approved Exablate 2000 employs MRI together with focused ultrasound for noninvasive surgical ablation of uterine fibroids. Something similar will surely be developed for ablation of arrhythmogenic foci in patients at risk for sudden cardiac death.

► **The biologic pacemaker.** This sort of cell-based therapy faces numerous hurdles, both political and scientific, but it's coming eventually for survivors of sudden cardiac arrest.

► **Novel neurostimulation-based antiarrhythmic therapies.** Dr. Zipes and his associates recently documented a major

reduction in ischemic ventricular arrhythmias with thoracic spinal cord stimulation in dogs with healed MI and superimposed heart failure.

Thoracic spinal cord stimulation applied by a device implanted next to the spinal column is already FDA approved for treatment of chronic refractory back pain. It's also under active investigation for refractory angina, an application where it shows considerable promise. The Indiana investigators reasoned that modulation of spinal cord activity could also curb ventricular arrhythmias.

And indeed it did. They showed in the dog model that this kind of spinal cord stimulation increased vagal and reduced sympathetic activity to the heart, the probable mechanism for the observed marked reduction in ischemia-related ventricular arrhythmias (*Circulation* 2005;111:3217-20).

Similarly, Dr. Zipes and his associates recently analyzed the cardiac electrophysiologic effects of intrathecal clonidine, another novel therapy for chronic pain. Clonidine is an α_2 -agonist that works centrally and at the spinal cord level to reduce sympathetic activity. The investigators showed intrathecal clonidine also decreased sympathetic activity to the myocardium, with a resultant significant reduction in ischemia-related ventricular arrhythmias in dogs. ■

Simple Score Predicts Benefit Of Early Revascularization

BY BETSY BATES
Los Angeles Bureau

LOS ANGELES — Specific findings on adenosine stress myocardial perfusion imaging can be combined with other risk factors to offer precise guidance about whether a patient would obtain a significant survival advantage with early revascularization, Rory Hachamovitch, M.D., said at a meeting sponsored by the American College of Cardiology.

Dr. Hachamovitch outlined the simplest of three new prognostic adenosine scores he validated in a group of 5,873 consecutive patients who underwent adenosine stress, dual-isotope single-photon emission computed tomography (SPECT) scanning, and were followed for a mean 2.2 years.

The simple score uses a patient's age, percent of ischemic myocardium, percent of fixed myocardium, presence or absence of dyspnea, resting ECG results, resting and peak stress heart rates, and scan results following early revascularization to predict a patient's 2-year mortality from cardiac causes.

Because revascularization can be plugged into the equation or left out, the formula can offer specific guidance as to the clinical management of an individual patient, said Dr. Hachamovitch of the clinical cardiovascular medicine unit at the University of Southern California, Los Angeles.

He offered the specific example of an 80-year-old man with atypical angina, assessing points to account for his age, the fact that 30% of his myocardium is ischemic, and other clinical characteristics and scan findings.

His final score was plotted on the x-axis of a graph against the 2-year Kaplan Meier Survival Curve on the y-axis.

The hypothetical patient received a total of 150 points if he underwent medical therapy, for a survival score of 91%, meaning he had a 9% chance of dying of cardiac causes in the ensuing 2 years.

When revascularization was factored into the formula, the patient's score dropped to 85 points, and his 2-year survival estimate rose to 97%.

The derivation of such a formula has been dependent on years of research into risk stratification for cardiac patients based on nuclear scan findings, said Dr. Hachamovitch at the meeting, which was cosponsored by the American Society of Nuclear Cardiology and Cedars-Sinai Medical Center.

This research has determined predictors of both relative and absolute risk reduction based on nuclear perfusion study results. Following Dr. Hachamovitch's talk, his findings were published (*J. Am. Coll. Cardiol.* 2005;45:722-9).

In general, the relative benefit of revascularization over medical therapy after nuclear imaging depends on the extent and severity of the myocardium at risk. ■

Myocardial Perfusion Imaging Urged As Initial Prognostic Test in Women

BY BRUCE JANCIN
Denver Bureau

ORLANDO — Myocardial perfusion imaging substantially restratifies women who have a moderate or high Duke Treadmill Score on exercise stress testing, with resultant markedly improved identification of those at elevated risk of a cardiovascular event as well as those who are not, Justin B. Lundbye, M.D., said at the annual meeting of the American College of Cardiology.

"Exercise myocardial perfusion imaging provides considerable incremental prognostic information over exercise stress testing alone. In this subset of women with intermediate to high pretest likelihood of coronary artery disease [CAD] based on Duke Treadmill Score, we feel that consideration should be given to utilization of exercise myocardial perfusion imaging as the first-line test," asserted Dr. Lundbye of Hartford (Conn.) Hospital.

Such a proposal is at odds with current ACC/American Heart Association guidelines, which recommend exercise stress testing (EST) alone as the preferred modality in women with an intermediate or high pretest probability of CAD. But those guidelines are due for an overhaul,

Dr. Lundbye argued, adding that because of the nature of EST, many women will have false-positive results. And that leads to numerous unnecessary coronary angiograms. Perfusion imaging reliably subclassifies women into two groups: those who require further testing and those who do not.

He reported on 1,020 women with an intermediate or high pretest likelihood of significant CAD who underwent EST along

with technetium-99 sestamibi myocardial perfusion imaging. During a

mean 2.4 years of follow-up, women with a moderate Duke Treadmill Score in the range of -10 to +4 (high risk to moderate risk) had an overall 3% annual rate of all-cause mortality, nonfatal MI, or coronary revascularization performed more than 2 months after their EST. Among the subset who had an abnormal myocardial perfusion imaging study, the combined annual event rate was 17%. In those with a normal perfusion imaging study, it was 2%.

Similarly, among women with a high-risk Duke Treadmill Score of -11 or less, the overall annual event rate was 12%. In those with an abnormal perfusion scan, the annual event rate climbed to 28%, while in those with a negative scan the rate was 4%. ■

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