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TREATING ARRHYTHMIAS WITH SUB-ZERO TEMPS HELPS PATIENTS LEAD ACTIVE, SYMPTOM-FREE LIVES

LOS ANGELES (Sept. 12, 2007) – When out-of-control nerve impulses cause the heart to beat irregularly, cardiologists often use heat during a minimally invasive outpatient procedure to destroy the defective signaling pathways and restore the rhythm to order.

But a newer form of catheter-delivered therapy for cardiac arrhythmias, called cryoablation, uses extreme cold, exposing the faulty tissue to sub-zero temperatures to destroy it. This approach is especially suited for treating certain patients with high-risk arrhythmias, according to Walter F. Kerwin, M.D., a cardiologist in the Division of Cardiology at Cedars-Sinai Medical Center, Cardiac Electrophysiology section.

During either procedure, a long thin tube is inserted through a blood vessel in the groin, wrist or arm and threaded to the heart. Catheter cryoablation uses intense cold (to -90 degrees Celsius) to ablate (destroy) very small, carefully selected areas of heart tissue that are causing the irregular rhythm. The effects of cryoablation occur slowly, over minutes. In contrast, the older technology, radiofrequency ablation, heats the defective tissue to destroy it within seconds.

Both cryoablation and radiofrequency ablation are also used in open-heart surgeries, and both are highly effective and useful forms of therapy.

Cryoablation is performed in a two-step approach that gives physicians an opportunity to assess the cooling effect on both normal and dysfunctional pathways. In the first step, the arrhythmia is “mapped,” with the tissue being cooled from normal body temperature (37 C) to 0 C. If a normal pathway is observed to stop conducting, the catheter can be thawed and the pathway will return to normal conduction. If cooling is seen to affect only the arrhythmia, however, the temperature can be further reduced to sub-zero temperatures to permanently eliminate the pathway.

Because the cryoablation procedure takes this two-step approach and the ablation takes minutes to complete, it is a potentially safer way to correct arrhythmias than radiofrequency ablation in patients whose normal conduction pathway and diseased conduction pathway are close to each other, said Kerwin, who uses catheter cryoablation to treat 95 percent of his patients who need ablation for their cardiac arrhythmias.

Patients with arrhythmias are commonly treated first with anti-arrhythmic medications such as digoxin, beta-blockers and other types of drugs to regulate their heartbeat. When medications fail to control the condition or their side effects are not well tolerated, other surgical and non-surgical treatments are considered.

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Catheter cryoablation has been performed for several years in the United States and Europe but its benefits, compared to other types of treatments for high-risk arrhythmias, are not widely known by the general public and some healthcare professionals, Kerwin said.

One of Kerwin's patients is 57-year-old Peter Nyquist of Weatherford, TX, who works for the Federal Aviation Administration as an air traffic control specialist. He had a type of arrhythmia called atrial fibrillation, an extremely rapid and uncoordinated heart rhythm that originated in all four of his pulmonary veins.

He first noticed more than a decade ago that he felt very tired and "washed out," but it took years before he knew why or what could be done. An Internet search led him to Kerwin, who performed a catheter cryoablation in 2006.

"I have my life back ... it's unbelievable," Nyquist said.

Kerwin is currently the principal investigator for a Food and Drug Administration (FDA) study to evaluate the safety of treating patients who have atrial fibrillation with a new cryoablation catheter system as compared to medication. Cedars-Sinai is the only center in the Southwest and one of only eight centers in the United States chosen to participate in this study.

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