

# Hiatal Hernia Upped Atrial Fibrillation Risk

ARTICLES BY  
BRUCE JANCIN

FROM THE ANNUAL MEETING OF THE  
HEART RHYTHM SOCIETY

DENVER — Hiatal hernia is associated with sharply increased risk of atrial fibrillation, according to a large Mayo Clinic study.

“The mechanism of the increased prevalence of atrial fibrillation in patients with hiatal hernia is not known but likely involves the direct mechanical effects of the hiatal hernia pressing on the left atrium or indirect effects through activation of the autonomic nervous system or inflammation,” Dr. Komandoor Srivathsan said at the meeting.

“Of course, it would be nice to show that if you treat the hiatal hernia with modified fundoplication, the atrial fibrillation rate goes down. We’re looking into that now in our database. We should have the answer in the next 6 months,” added Dr. Srivathsan of the Mayo Clinic, Rochester, Minn.

The study was undertaken after he and his coinvestigators formed an impression that a disproportionate number of patients at the clinic’s large-volume atrial ablation center had hiatal hernias on their preablation CT scans, echocardiography, or both. So the researchers used the clinic’s electronic records to identify the 111,429 adults diagnosed with hiatal hernia during 1976-2006. Among this group were 5,929 patients diagnosed with new-

onset atrial fibrillation after they had already received a diagnosis of hiatal hernia.

For purposes of comparison, the investigators turned to published data on the Olmsted County and statewide Minnesota general populations. In this way, they determined that the prevalence of atrial fibrillation in men under age 55 with hiatal hernia was 13-fold greater than in the age-matched general population. Among women under age 55, atrial fibrillation was 15-fold more likely if they had a hiatal hernia.

Moreover, the prevalence of atrial fibrillation in men with hiatal hernia remained several-fold greater than in men without this abdominal defect up until about age 80. Among women, this remained the case even beyond age 80, Dr. Srivathsan continued.

Patients with hiatal hernia and atrial fibrillation were a mean of 73 years old at the time of their dual diagnosis, compared with 61 years for those with either diagnosis alone. The dual-diagnosis group had significantly more hypertension, diabetes, hyperlipidemia, coronary artery disease, heart failure, and sleep apnea.

The dual-diagnosis group had markedly worse long-term outcomes than did the general population. “One you have the combination, it seems to be a strong predictor of congestive heart failure,” the cardiologist observed. ■

**Disclosures:** Dr. Srivathsan reported no conflicts of interest.

# Sharp Rise in Pacemaker Use Projected in Next 2 Decades

FROM THE ANNUAL MEETING OF THE  
HEART RHYTHM SOCIETY

DENVER — Total annual pacemaker implantations in the United States will climb by 50% from the year 2010 level to 2027, while a 50% increase in implantable cardioverter defibrillator placements will occur by 2029, according to new mathematical modeling.

These new projections are based on a constant 2007 device utilization rate with superimposed U.S. Census Bureau forecast demographic trends. The resultant sharp rise in the absolute number of procedures is being driven solely by the nation’s aging population demographics, Steven M. Kurtz, Ph.D., explained at the meeting.

“These are conservative assumptions. Right now in our projections the increase is driven by the population mix, not by changes in technology or changes in the indications,” said Dr. Kurtz, research professor of biomedical engineering, science, and health systems at Drexel University, Philadelphia, and corporate vice president at Exponent Inc., an engineering and scientific consulting firm.

Should the indications for device therapy expand in the future, as has occurred for implantable cardioverter defibrillator (ICD) therapy within the past decade, then the projected increase in implantations and associated increase in health care costs “could be of much greater magnitude,” he added.

The projected use of pacemakers and ICDs was constructed by combining 2004-2007 data from the Department of Health and Human Services’ Nationwide Inpatient Sample on average procedure rates in various population subgroups with Census Bureau estimates of coming changes in the population. The Nationwide Inpatient Sample is a statistically valid survey of about 1,000 U.S. hospitals that incorporates roughly 20% of all hospital admissions.

Pacemaker removals and revisions are expected to increase from 33,510 procedures this year to 53,121 in 2030, a 59% increase. ICD removals and revisions are anticipated to climb from 8,065 in 2005 to 12,415 in 2030, a 54% rise, according to Dr. Kurtz.

The increase in pacemaker implantations will be greatest in the 65- to 84-year-old age group and it will come at the expense of the very elderly. While 64% of all pacemakers were placed in 65- to 84-year-olds in 2007, this proportion will grow to 83% by 2030. Meanwhile, the proportion of pacemakers implanted in patients aged 85 and up will decline from 25% to 12%.

The proportion of primary ICD implantations in patients aged 65-84 is projected to rise from 56% in 2007 to 68% by 2030, while ICD placement in patients younger than 65 will decline from 39% to 27%. ■

**Disclosures:** The study was funded by Medtronic.

# CPAP Reversed Left Ventricular, Atrial Remodeling

FROM THE ANNUAL MEETING OF THE  
ASSOCIATED PROFESSIONAL SLEEP SOCIETIES

SAN ANTONIO — Six months of continuous positive airway pressure therapy markedly improved adverse left ventricular and atrial remodeling in patients with moderate to severe obstructive sleep apnea in a prospective study.

Diastolic as well as systolic abnormalities were reversed, raising the welcome prospect that CPAP is likely to prevent the development of one of the most dreaded complications of severe obstructive sleep apnea (OSA)—chronic heart failure—although this point remains speculative, Dr. Saleh Al-Mutairi said.

He recruited 32 patients with newly diagnosed moderate to severe OSA for the study, which involved serial follow-up by cardiac magnetic resonance (CMR), echocardiography, and cardiac biomarkers through 6 months of individually titrated CPAP therapy.

The subjects averaged 51 years of age, with a mean baseline apnea-hypopnea index of 53 events/hr and a body mass index of 34.5 kg/m<sup>2</sup>. None of the participants had known cardiac disease. Adherence to CPAP was good. The patients’ weight didn’t change significantly during the study, and those being treated for hypertension remained on the same doses of

medication throughout the follow-up period.

Other studies have shown improvement in left ventricular dysfunction with CPAP, but they were short-term trials. This is the first study with follow-up as long as 6 months using both CMR and echocardiography, according to Dr. Al-Mutairi of the University of Manitoba, Winnipeg.

He focused on the CMR results because he considers that technology more reliable than echocardiography for assessing ventricular size and function. The echo findings, however, corroborated the CMR results.

Most of the left ventricular measurements followed during the study were abnormal at baseline. The 6-month results included a 25% reduction from baseline in left ventricular end-diastolic volume and a 19% decrease in left ventricular mass.

Dr. Al-Mutairi drew particular attention to the 30% reduction in left atrial volume index, which he considers highly encouraging.

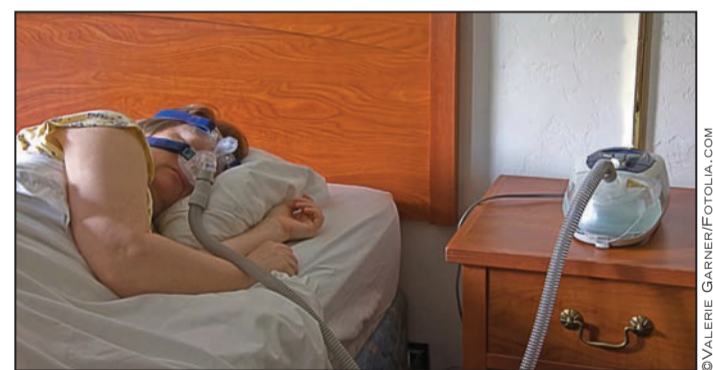
“The treatment of OSA with CPAP may prevent the left atrial remodeling measured by CMR and echo as the left atrial volume index. This is a very important point, given the association between the left atrial volume and cardiovascular events,” he observed.

See related  
stories on pages  
74 & 75.



**Six-month results included a 25% reduction from baseline in left ventricular end-diastolic volume.**

DR. AL-MUTAIRI



In patients with moderate to severe sleep apnea, the left atrial volume index fell 30% after 6 months of CPAP therapy.

There was no significant change in C-reactive protein, brain natriuretic peptide, or other cardiac biomarkers during the 6 months of CPAP use.

The mechanism by which OSA is thought to predispose to heart failure involves an exaggerated negative thoracic pressure in response to the apneic episodes. This presumably leads to increased left ventricular systolic transmural pressure, which the left atrium resists, with resultant increased compliance and atrial overstretching, Dr. Al-Mutairi explained.

He and his coinvestigators are in the midst of expanding their study to 50 patients in order to strengthen the conclusions. ■

**Disclosures:** Dr. Al-Mutairi reported having no financial conflicts.