



### **Pulmonary Vein Denervation Enhances Long-Term Benefit After Circumferential Ablation for Paroxysmal Atrial Fibrillation**

Pappone C, Santinelli V, Manguso F, et al. *Circulation* 2004;109:327–34.

**Study Question:** Does vagal denervation improve the results of radiofrequency catheter ablation (CA) of paroxysmal atrial fibrillation (PAF)?

**Methods:** In 297 patients with PAF (mean age 49 years, 69% without structural heart disease), the left- and right-sided pulmonary veins were encircled, and additional ablation lines were created in the posterior left atrium and mitral isthmus. A vagal reflex was defined as a rate <40/min, asystole, atrioventricular block, or hypotension evoked during CA, and ablation was continued until the reflex was abolished. Heart rate variability (HRV) was determined from Holter monitor recordings at baseline and 1 week, 3 months and 6 months following ablation.

**Results:** Vagal reflexes were elicited in 102 patients (34%), usually at atrial sites near the pulmonary veins, and were abolished by CA in 100/102 patients. Changes in HRV were consistent with vagal denervation, peaked at 1 month, were larger in magnitude among patients without recurrent PAF, and resolved at 6 months' post-CA. At 12 months of follow-up, 99% of patients in whom a vagal reflex was elicited and abolished were free of PAF, compared to 85% of patients in whom vagal reflexes were not elicited.

**Conclusions:** Vagal reflexes are evoked by left atrial CA in approximately one-third of patients with PAF, and abolition of the reflex significantly reduces the probability of recurrent PAF postablation.

**Perspective:** This study raises the intriguing question of whether vagal denervation by itself, without extensive left atrial CA, might be sufficient to prevent PAF. However, the fact that 85% of patients who did not have a vagal reflex elicited still had an excellent outcome indicates that multiple mechanisms are at play and that left atrial CA has beneficial effects other than vagal denervation. FM

### **Canadian Trial of Physiologic Pacing. Effects of Physiologic Pacing During Long-Term Follow-up**

Kerr CR, Connolly SJ, Abdollah H, et al. *Circulation* 2004;109:357–62.

**Study Question:** Compared to ventricular pacing, does atrial-based pacing lower the risk of death, stroke or atrial fibrillation (AF)?

**Methods:** In this multicenter trial, patients with symptomatic bradycardia were randomly assigned to receive either a physiologic pacemaker (usually a dual-chamber pacemaker, n=1094) or a ventricular pacemaker

(n=1474). The two groups did not differ significantly in baseline characteristics. The mean duration of follow-up was 6.4 years.

**Results:** The annual rate of the composite outcome of cardiovascular mortality or stroke was approximately 6% and did not differ significantly between the two treatment groups. Also, no significant differences occurred in total mortality or stroke rate. The relative risk of AF was 20% lower with physiologic compared to ventricular pacing, and the absolute risk reduction of AF over 6.4 years of follow-up was 6.9%.

**Conclusions:** Compared to ventricular pacing, physiologic pacing does not affect mortality or stroke risk, but does reduce the long-term incidence of AF.

**Perspective:** Recent studies have demonstrated that right ventricular pacing, either by itself or in association with synchronized atrial pacing, predisposes to AF and increases the risk of death and heart failure. A major limitation of this study is the lack of data on the total amount of ventricular pacing in the two treatment groups. It therefore is unclear to what degree ventricular pacing acted as a confounding variable. An untainted comparison of atrial-based vs. ventricular pacing will require treatment groups of single-chamber atrial pacing and ventricular pacing. FM

### **Time Dependence of Mortality Risk and Defibrillator Benefit After Myocardial Infarction**

Wilber DJ, Zareba W, Hall J, et al. *Circulation* 2004;109:1082–4.

**Study Question:** Does the survival benefit of an implantable cardioverter/defibrillator (ICD) in postinfarction patients with an ejection fraction (EF)  $\leq 30\%$  depend on the elapsed time from myocardial infarction (MI)?

**Methods:** This analysis was based on the MADIT II study, in which 1232 patients with prior MI and an EF  $\leq 30\%$  were randomly assigned to receive either an ICD or conventional medical therapy. The elapsed time from the most recent MI was divided into quartiles of <1.5 years, 1.5–<5 years, 5–<10 years, and  $\geq 10$  years.

**Results:** In the medical group, the mortality rate increased from 7.8% to 14% as the elapsed time from MI lengthened from <1.5 years to  $\geq 10$  years. In the ICD group, the mortality rate averaged approximately 7% and did not differ significantly among the quartiles of time from MI. The ICD conferred no survival advantage when the time from MI was <1.5 years, and it reduced mortality by 45% when the time from MI was  $\geq 1.5$  years.

**Conclusions:** In patients with prior MI and an EF  $\leq 30\%$ , ICDs improve survival when the elapsed time from MI is  $\geq 1.5$  years. The ICDs continue to confer a survival benefit even when the elapsed time from MI is >10 years.

**Perspective:** One might reason that a patient who has been stable for >10 years after an MI has “stood the test of time” and would not benefit from a prophylactic ICD. However, when a large scar is present (as when the EF is  $\leq 30\%$ ),