requires large numbers of patients, pooling of individual studies seems an attractive option. By further optimization of the management of heart failure patients a large number of hospitalizations can be prevented, potentially resulting in an appreciable cost reduction and better quality of life for heart failure patients.

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the patients. The Pharmacological Intervention in Atrial Fibrillation (PIAF) trial was an open label trial that randomized 252 patients with persistent atrial fibrillation to a strategy of rate control or rhythm control. At 12 months there were no differences in the proportion of patients whose quality of life had improved (the primary end-point) between the two groups. Although the patients in the rhythm control group were able to walk further in the 6-min walk test than the rate control patients, less than half the patients were able to do this test. The rhythm control group suffered a higher rate of hospital admissions and experienced more adverse drug effects that required a change in therapy.

The PIAF trial was not designed to look for differences in mortality. We are still awaiting the results from a larger study that is comparing these two strategies. The Atrial Fibrillation Follow-up Investigation of Rhythm Management (AFFIRM) Study is a United States National Heart Lung & Blood Institute sponsored randomized trial of rate control versus rhythm control in the long-term management of atrial fibrillation. Both groups in AFFIRM are anticoagulated with warfarin. The primary end-point is total mortality, and there were also a number of clinically important secondary end-points. A total of 4060 patients were enrolled. AFFIRM follow-up was completed in October 2001 (after a minimum follow-up of 2 years for each patient), and preliminary data from the AFFIRM study will be presented at the American College of Cardiology Annual Meeting in March 2002. Other small studies assessing the strategies of rate vs rhythm control have reported mixed results in abstract form. Two other rate vs rhythm studies are currently in progress: the RACE study from the Netherlands and the Atrial Fibrillation and Congestive Heart Failure (AF-CHF) study.

Pending the results of these studies, efforts continue to be made to define patient populations where rhythm control is most appropriate. Atrioventricular junction ablation with permanent pacing is effective symptomatic therapy for patients with atrial fibrillation who are either refractory to medical therapy or intolerant of medical therapy. However, many of these patients develop permanent atrial fibrillation following this procedure. In this issue Brignole et al. report on a randomized open-label trial of antiarrhythmic drug therapy vs no antiarrhythmic drug therapy after successful atrioventricular junction ablation (and DDDR pacemaker implantation) in 137 patients with severe, symptomatic paroxysmal atrial fibrillation. All randomized patients ‘failed’ therapy with at least three antiarrhythmic drugs and had at least three episodes of atrial fibrillation within the 12 months prior to enrolment. The primary end-point of this study was progression to permanent atrial fibrillation, as measured during follow-up every 3 months (12–24 months). Fewer patients assigned to the antiarrhythmic drug therapy group than the no antiarrhythmic drug therapy group developed permanent atrial fibrillation after a mean follow-up of 16 ± 4 months (odds ratio 0·43 [95% CI 0·18–0·98]). As can be seen in their actuarial survival curve, the difference in the prevalence of permanent atrial fibrillation was also much greater at 12 months (antiarrhythmic drug therapy 14% vs no antiarrhythmic drug therapy 36%) than at 24 months (antiarrhythmic drug therapy 30% vs no antiarrhythmic drug therapy 40%). Although the number of patients at risk at 24 months is small (only 17 patients), they do suggest that the efficacy of the antiarrhythmic drug therapy in preventing permanent atrial fibrillation wanes with extended follow-up.

While this current study suggests that sinus rhythm can be maintained for at least a short time after atrioventricular junction ablation in this selected population with frequent paroxysms of atrial fibrillation, is it worth the effort?

Quality of life was measured in this study at baseline and at 12 months. Both groups experienced a greater than 50% improvement in quality of life score using the Minnesota Living with Heart Failure questionnaire, suggesting a beneficial effect of the ‘pace and ablate’ approach. However, there was no difference in quality of life score between the antiarrhythmic drug therapy group and the no antiarrhythmic drug therapy group. Echocardiographic parameters were also measured at baseline and at 12 months to assess cardiac remodelling. Again, there were no differences between the two groups. Of more concern are the adverse events reported in the study. Compared with the no antiarrhythmic drug therapy group, the group receiving antiarrhythmic drug therapy had more patients experience a worsening of their heart failure (antiarrhythmic drug therapy 22% vs no antiarrhythmic drug therapy 10%; \(P = 0·05\)) and more patients hospitalized for heart failure (antiarrhythmic drug therapy 18% vs no antiarrhythmic drug therapy 7%; \(P = 0·05\)). Four of the five deaths during the study were in the antiarrhythmic drug therapy group. Due to the small number of patients in this study, this difference in mortality was not statistically significant. However, the trend toward increased mortality with antiarrhythmic drug therapy does raise concerns about the safety of these medications.

The strategy of maintaining sinus rhythm after atrioventricular junction ablation also carries a
financial cost. If one were not concerned with permanent atrial fibrillation, one could not only save the costs of the antiarrhythmic drugs, but one could also implant a less costly pacemaker than the DDDR devices used in this current study. If the maintenance of sinus rhythm is not a goal, then the potentially pro-atrial fibrillation effects of ventricular pacing[16] are not of any concern, and a cheaper VVIR pacemaker could be used.

Thus although this current study[15] shows that antiarrhythmic drug therapy can help to maintain sinus rhythm, it does not really show any tangible benefit from doing so in this highly selected population after atrioventricular junction ablation and DDDR pacemaker implantation. Should this study put an end to the debate about maintaining sinus rhythm after atrioventricular junction ablation? Not just yet. Although the current study was well designed, it is still only one study whose results need to be reproduced to be more convincing. Due to the open label nature of the trial, the potential for bias exists — both in the patients’ self reported quality of life scores and in the physician assessments of congestive heart failure.

The role of pacemakers themselves in the maintenance of sinus rhythm is still undergoing study. This issue is not addressed in the present study because the pacing regimen was the same in both arms. The Dual Site Atrial Pacing for Prevention of Atrial Fibrillation (DAPPAF) trial was recently published as an abstract[17]. In this trial, 120 patients with bradycardia requiring cardiac pacing and atrial fibrillation were randomly assigned to dual-site right atrial pacing, single-site atrial pacing, or back-up ventricular pacing only. When compared to ventricular back-up pacing alone, dual site pacing trended toward a longer time to first symptomatic atrial fibrillation recurrence. This trend became a statistically significant difference in the subgroup receiving class I or class III antiarrhythmic drugs and having episodes of paroxysmal atrial fibrillation no more frequently than once per week. The results are different from the PA3 study[18], which found no benefit from atrial pacing in a group with frequent atrial fibrillation but without a bradycardia indication for pacing. It is possible that the benefits of pacing to prevent atrial fibrillation might be restricted to patients with bradycardia or pause-dependent atrial fibrillation. Finally, there are novel pacing algorithms designed both to prevent the initiation of atrial fibrillation and to pace terminate atrial tachycardias before they can degenerate into atrial fibrillation[19,20]. While some preliminary reports of these algorithms have been promising, properly powered randomized, double-blind clinical trials are needed before we truly know whether they are effective or not.

The presence of atrial fibrillation carries a significant morbidity and mortality. However, once atrial fibrillation is present, the current data suggests that efforts to maintain sinus rhythm with antiarrhythmic drug therapy might carry a greater morbidity. However, we must await the results of the AFFIRM study before tolling the death knell for the rhythm-control strategy in the management of atrial fibrillation. At this time, we agree with the authors that efforts to maintain sinus rhythm after atrioventricular junction ablation are not warranted.

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