

AF Today:

What are the Options?

Management strategies for patients with atrial fibrillation should depend on the individual patient. Treatment with medications seems adequate for most patients with atrial fibrillation. So, what do the recent studies recommend, and what happens when drug treatment simply does not help?

Magdy N. Basta, MB, BCh, FRACP

For the majority of patients with atrial fibrillation (AF), treatment with medications remains the optimal management strategy.

The ultimate goals of AF therapy are to:

- relieve symptoms,
- prevent thromboembolic events, and
- prevent tachycardia-induced cardiomyopathy.

The potential for thromboembolic complications associated with AF has been addressed in several important clinical studies; all demonstrated beneficial effects of adequate anticoagulation with warfarin in AF patients at risk for stroke. Adjusted-dose warfarin therapy is pivotal in the management of AF patients with stroke risk factors.

Therapy with acetylsalicylic acid alone is appropriate for specific subgroups of patients with AF who are at low risk for stroke based on the absence of clinical and echocardiographic factors and for those with contraindication to warfarin therapy.

Chris' Case

Chris, 46, has a 12-year history of recurrent episodes of atrial fibrillation (AF) associated with lightheadedness, disabling fatigue, and shortness of breath.

His episodes often last hours at a time and recur several times a week, with a heart rate of 90 to 160 beats/minute. He has no other cardiac history, medical history, or hypertension.

Chris' echocardiography study and exercise treadmill tests were normal.

His tolerance to various medications was poor:

- metoprolol caused overwhelming fatigue and sexual dysfunction;
- verapamil resulted in edema, bloating, and no improvement in symptoms;
- sotalol resulted in fatigue, without improvement in his symptoms; and
- a combination of propafenone and diltiazem also failed to improve his symptoms.

**What would you do for Chris?
For a followup, go to page 31.**





What do the trials say?

The selection of the treatment strategy with rhythm or rate control should be individualized, considering the symptomatic status of the patient, and other factors such as age and cardiac risk factor profile. There have been five clinical studies addressing the potential merits of treatment with rate versus rhythm control in patients with AF. Both smaller and larger trials reached similar conclusions.

The Atrial Fibrillation Followup Investigation of Rhythm Management (AFFIRM) study included 4,060 patients with AF and risk factors for stroke or death. Few had severely impaired systolic function or advanced congestive heart failure (CHF). Patients younger than 65 had to have at least one clinical risk factor for stroke or death, including:

- systemic hypertension,
- diabetes mellitus,
- CHF,
- prior cerebral vascular accident,
- large left atrium (> 50 mm),
- fractional shortening < 25%, and
- left ventricular ejection fraction (< 40%)

The total mortality for patients assigned rhythm control was 23.8% at five years, compared to 21.3% in patients assigned rate con-

rol medications. More deaths occurred in the rhythm control group, but the difference was not statistically significant. More patients in the rhythm control group experienced adverse drug effects and more were hospitalized.

In both groups, the majority of strokes occurred after warfarin had been stopped or when the international normalized ratio (INR) was sub-therapeutic.

Total mortality at five years was 23.8% in patients assigned rhythm control and 21.3% in patients assigned rate control medications.

The study concluded there were no clear advantages of rhythm control over rate control.

Prior to AFFIRM, rate control management was largely considered a fallback option for patients presenting with AF and repeat attempts at restoration and maintenance of sinus rhythm was considered the standard management. In the AFFIRM study, the proposed advantages of maintaining sinus rhythm with antiarrhythmic drugs (*e.g.*, less symptoms, better quality of life, better exercise tolerance, lower risk of stroke, and better survival with rhythm control) were not realized. Thus, rate control treatment can be considered as equivalent, if not advantageous to rhythm control, when appropriate for the individual patient.

About the author...

Dr. Basta is an active staff member at the Queen Elizabeth II Health Sciences Centre, and associate professor of medicine, Dalhousie University, Halifax, Nova Scotia.

Table 1

Limitations of AF ablation

- Relatively new procedures with unknown long-term outcome
- Potential risks can be serious and even fatal, including:
 - stroke 1-2%
 - pericardial effusion and tamponade
 - pulmonary vein stenosis
 - thermal injury to the esophagus and other structures
- Recurrence of atrial arrhythmia often requires repeat procedures
- Pro-arrhythmic effects with creation of substrates for macro-reentrant atrial tachycardia and atrial flutter

Followup on Chris

Chris was referred for electrophysiology (EP) study and catheter ablation for his arrhythmia. In 2001, he underwent an EP study and was found to have atrioventricular (AV) node re-entry tachycardia, for which he underwent slow pathway ablation.

In 2002, he had recurrent symptomatic AF requiring cardioversion. He underwent an ablation procedure involving isolation of three pulmonary veins.

In 2003, he presented with recurrent AF associated with shortness of breath, chest heaviness, and diaphoresis requiring multiple cardioversions. He underwent another ablation procedure and was treated with amiodarone and warfarin for three months. All antiarrhythmic drugs were discontinued and he had no recurrence of AF.

What if rhythm control doesn't work?

Until recently, atrioventricular (AV) node ablation and permanent pacemaker implantation were the only catheter-based interventions available for patients with AF.

Atrioventricular (AV) nodal ablation and pacing can be beneficial in a selected group of patients with symptomatic AF, can significantly improve quality of life, and may improve cardiac function. This approach is most beneficial for patients with a more persistent form of AF and patients who have

nating the triggering mechanisms through isolation of the pulmonary veins, or suppression of the maintenance mechanisms of AF, have been developed.

Pulmonary vein isolation is an electricaly guided approach designed to prevent the initiation of AF by isolating AF-triggering foci from the body of the atrium.¹ A more anatomic approach involves circumferential ablation of the left atrial wall around the origins of the pulmonary veins.² This may influence the activation of the atria and regions of the atrial myocardium as potential sites of perpetuation of the arrhythmia.

Average success rates from 60% to 80% have been reported in selected patients with paroxysmal AF. However, the optimal ablation procedure has yet to be defined. AF ablation does have its limitations (see Table 1).

Success rates for AF ablation vary from 60% to 80%.

relatively severe symptoms (attributable to the rapid and irregular ventricular rates that cannot be effectively treated with existing drugs for rate control).

Alternative approaches aiming at elimi-



Who is eligible for AF ablation?

Symptomatic patients with paroxysmal AF who have no, or only mild, structural heart disease are the best candidates. In this group, the procedural success is higher with fewer

expected complications. Patients selected often will have failed multiple trials of antiarrhythmic drugs and remain highly symptomatic, with disruptive arrhythmia.

What about patients with bradycardia-indication?

Pacing is often required for management of patients with sick sinus syndrome, with or without history of AF. At least three randomized clinical studies demonstrated patients with no prior AF who were implanted with atrial-based pacemakers are less likely to develop AF, compared to patients managed with ventricular pacing.

in the primary outcome of stroke or cardiovascular death (annual rating 4.9% versus 5.5%) between the two pacing modes.


Patients implanted with dual-chamber pacemakers, in whom intrinsic AV node conduction is intact, benefit with programming a longer AV delay to enable intrinsic AV conduction and, thus, to reduce ventricular pacing as much as possible. Supportive data shows that ventricular pacing can lead to increased risk of AF development.

The Mode Selection Trial in sinus node dysfunction (MOST) randomized 2,010 patients with sick sinus syndrome to ventricular pacing or dual-chamber pacing.⁴ Overall, AF incidence was lower and fewer patients progressed to chronic AF with dual chamber pacing (15.2% versus 26.7%). Thus, the available data supports the use of atrial-based pacing for the purpose of decreasing the incidence of AF episodes in patients with sick sinus syndrome.

A *AF incidence was lower and fewer patients progressed to chronic AF with dual chamber pacing.*

The Canadian Trial of Physiologic Pacing (CTOPP) study randomized 2,568 patients to implantation of physiologic pacemakers or ventricular-based pacemakers.³ After a mean followup of three years, patients randomized to physiologic pacing were found to have a lower incidence of AF (annual rate of 5.3% versus 6.6%). There was no significant difference

Pacing to prevent AF without sick sinus syndrome

In patients with AF, without bradycardia indication for pacing, the majority of studies have failed to show significant reductions in overall AF incidence or AF burden. Atrial pacing cannot be justified on the basis of existing data in patients without sick sinus syndrome. 

References

1. Haissaguerre M, Shah DC, Jais P, et al: Electrophysiological breakthroughs from the left atrium to the pulmonary veins. *Circulation* 2000; 102(20):2463-5.
2. Pappone C, Rosanio S, Oreto G, et al: Circumferential radiofrequency ablation of pulmonary vein ostia: A new anatomic approach for curing atrial fibrillation. *Circulation* 2000;102(21):2619-28.
3. Connolly SJ, Kerr CR, Gent M, for the CTOPP Investigators: Effects of physiologic pacing versus ventricular pacing on the risk of stroke and death due to cardiovascular causes. *N Engl J Med* 2000; 342(19):1385-91.
4. Lamas GA, Lee KL, Sweeney MO, et al: Ventricular pacing or dual chamber pacing for sinus-node dysfunction. *N Engl J Med* 2002; 346(24):1854-62.

Take-home message

- The ultimate goals of AF therapy are to:
 - relieve symptoms;
 - prevent thromboembolic events; and
 - prevent tachycardia-induced cardiomyopathy.
- Studies show rate control treatment is equal, if not advantageous to, rhythm control, when appropriate for the individual patient.
- Symptomatic patients with drug refractory paroxysmal AF can be selected for catheter ablation.
- Implantation of atrial or physiologic pacemakers is warranted when pacing is required for patients with sick sinus syndrome.

www.stacommunications.com



For an electronic version of this article, visit: *Perspectives in Cardiology* online.